FACILITIES PLANNING DOCUMENT

West Central Wisconsin Biosolids Facility

Ellsworth, Wisconsin

October 2020

TOWN & COUNTRY
ENGINEERING, INC.

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General Overview

The West Central Wisconsin Biosolids Facility is undertaking facilities planning to address equipment and process deficiencies, meet current and future capacity requirements, and provide the staff with increased flexibility in dealing with daily operational conditions. This Facilities Planning Document establishes long term conditions for which the facility must be designed and identifies processes and equipment that are to be upgraded or replaced to meet the overall goals set forth.

The planning process necessarily depends on input from the Facility's officials and staff to become a successful planning tool. Historical records have been evaluated and projections have been made to establish long term needs. The recommended alternative for implementation is summarized in the following sections included within this chapter, however for a more detailed look at all alternatives evaluated, refer to the remaining chapters and appendices.

Facility Loadings and Projections

In order to develop alternatives for upgrades at the Facility, an analysis of the biosolids hauled to the site was performed. Based on daily data collected by the Facility, a summary of biosolids volume and loading was developed to determine current loadings on an annual average, maximum month, maximum week, and maximum day condition. Using the current volume and loadings, a system model was developed in order to evaluate unit processes and identify deficiencies. At current conditions, the Facility has process deficiencies related to biosolids receiving, screening and storage, centrate storage, Class A biosolids storage, and odor control. Chapter 2 and Chapter 3 of this Facilities Planning Document focuses on the condition of the existing Facility and the current loads.

The data analysis, when compared to data from the previous Facility evaluation in 2008, indicated trends of approximately 2% per year growth at the Facility on an annual basis. Based on these trends, the loading projections for the Facility were assumed to grow at 2% per year during the design period, through 2038. These projected loadings create additional Facility deficiencies that will occur, including biosolids pumping and dewatering capacity. Chapter 4 presents the future design conditions based on the projected growth.

Based on the current and projected Facility loadings, there will be baseline upgrades required to continue processing biosolids and producing a Class A product with current operations. These baseline upgrades are presented in both Phase 1 and Phase 2 projects, depending on the need identified in the loadings analysis and system model.

Evaluation of Alternatives

In addition to baseline required upgrades at the Facility to meet the current and projected biosolids and centrate loadings, an alternatives analysis was completed for the process by which to continue producing Class A biosolids. Chapter 5 identifies the alternatives for Facility upgrades to the biosolids process and to address current processes deficiencies, as well as general plant issues and operational improvements. Alternative A was designated for continued use of the lime stabilization process and production of Class A biosolids to approximately 30 to 35% solids. This alternative requires expansion of Class A biosolids storage, which is proposed to be accomplished

with a new storage space adjacent to the existing Facility. Alternative B was designated as utilization of the existing lime stabilization process to product Class A biosolids, followed by sludge drying to produce a 60% solids product in an effort to reduce volume and create a more easily managed product for agricultural application. Alternative C removes the lime stabilization process and instead utilizes sludge drying only to achieve Class A biosolids at a 90% solids level. All alternatives included an evaluation of odor control equipment to adequately treat odors created in the process.

Within Chapters 6 and 7, capital, operational, replacement, and present worth cost estimates were developed for each alternative. Additionally, other factors were considered including utilization of existing structures; potential construction issues; future facility expansion capability, related to the ability to add structures and technology for future upgrades; operational concerns including flexibility, ease of operation and safety for Facility staff; energy efficiency; biosolids production, storage and distribution; and noise, air quality, and other environmental factors.

Conclusions

The Facility has a strong desire to decrease the final volume of biosolids to be stored and distributed, along with the needs to increase capacity, improve working conditions at the Facility, and decrease odor issues. The final volume of biosolids generated by the Facility could increase proportionally with growth while utilizing the current lime stabilization process, or sludge drying could be installed to reduce volume and generate a more spreadable and marketable final product. The current loadings to the Facility are such that baseline Phase 1 upgrades are warranted to ensure capacity for the next ten years. Future loadings to the Facility would require Phase 2 upgrades to address additional capacity deficiencies. Odor issues and the resulting treatment options and equipment scale differ depending on the biosolids processing alternative selected by the Facility.

When considering baseline phased upgrades in addition to the biosolids processing alternatives, Alternative A is the lowest capital and present worth costs of the alternatives evaluated. However, when considering the non-economic factors, Alternative A does not present a feasible option for the continued operation and increased loadings at the Facility. Alternative B and C address the Facility's goal of reducing Class A biosolids, however Alternative C does so while producing less odors and does not require the addition of lime, which has created dust and air quality issues for the Facility staff. Either Alternative utilizing drying is a more efficient process when operations of the dryer are continuous, opposed to intermittent starting and stopping to line up with typical daily operation schedules. In Alternative C, the Facility will need to further investigate storage options, utilizing storage silos or automated bulk bagging, based on the demand for the eventual end product.

It is the Facility's intent to use a phased approach to address these issues. The first phase of design and construction will address site work, receiving, screening, sludge and centrate storage tanks, and a chemical feed building. The second phase of design and construction focuses on the capacity of the centrifuge units and pumping requirements for the sludge and centrate tanks.

Recommendations

Based on the economic and non-economic evaluations presented in Chapters 6 and 7, the recommended alternative for the Facility improvements is Alternative C2, which includes removal of the existing lime stabilization process which is to be replaced with sludge drying equipment to

continue producing Class A biosolids. The construction also includes the baseline phased upgrades for the Facility including improvements to biosolids handling, receiving, pumping, and dewatering, along with odor control and chemical feed improvements. Although this option does not have the lowest capital or present worth costs, the evaluation of other factors outweighs the slight cost increases, which are within 10% of Alternative B. The annual operating expenses for this alternative are expected to be less than Alternative B, and generally consistent with current operational costs.

The recommendations proposed for the Facility upgrades are summarized as follows:

- Site improvements included paving and site piping
- Addition of a second biosolids receiving bay and scale
- Addition of a second biosolids screen to serve the new receiving bay
- Conversion of existing centrate storage tanks into biosolids storage tanks with mixing
- Construction of a new centrate storage structure
- Construction of a new chemical feed building
- Replacement of dewatering centrifuges to increased capacity units
- Replacement of centrifuge feed pumps to increased capacity units
- Decommission the existing lime stabilization process
- Construct a new sludge drying space within the existing sludge storage area to house new drying equipment and conveyors
- Construction of new odor control equipment to replace the existing chemical scrubber

Aside from the increased capacity pumping and dewatering equipment, all of these improvements are recommended for Phase 1 of construction at the Facility, which is expected to begin around 2022 depending on funding sources. The subsequent phase of construction, designated as Phase 2, will depend on the actual growth at the Facility, and future changes to the Facility loadings.

Cost Summary of Selected Alternative

The following table presents the total estimated capital costs for the selected Alternative C2, broken out by phases.

Items	Cost	
Phase 1 Loadings Upgrades		
Site Work	$	259,200
Receiving	$	833,621
Screening	$	547,870
Sludge Tanks	$	319,999
Centrate Storage Tanks	$	1,212,417
Chemical Feed Building	$	552,023
Construction Subtotal	$	3,725,131
Contractor Costs	$	335,262
Contingencies	$	406,039
Engineering, Admin, Legal	$	568,455
Resident Engineering	$	121,812
Total Cost Phase 1 Loadings	**$**	**5,156,699**
Phase 1 Biosolids Process Upgrades		
Lime Stabilization Equipment	$	60,826
Sludge Drying	$	8,391,519
Odor Control Equipment	$	315,386
Construction Subtotal	$	8,767,731
Electrical	$	876,773
Contractor Costs	$	868,005
Contingencies	$	1,051,251
Engineering, Admin, Legal	$	1,576,876
Resident Engineering	$	315,375
Total Cost Phase 1 Biosolids	**$**	**13,456,012**
Phase 2 Loadings Upgrades		
Centrifuge Dewatering Units	$	1,059,667
Sludge Pumping	$	415,942
Construction Subtotal	$	1,475,610
Contractor Costs	$	213,939
Contingencies	$	259,104
Engineering, Admin, Legal	$	362,746
Resident Engineering	$	77,731
Total Cost Phase 2 Loadings	**$**	**2,389,130**
Total Cost All Phases of Work	**$**	**21,001,840**

User Charge Impact

Chapter 8 provides information on effects of implementing the recommended project on the Facility's user charge system. To ensure sufficient revenue exists to offset the project debt load, user charges for contributing communities are expected to increase by approximate 49% to 72% from the current average charges. The range of projected increases are based on the total capital

cost expenditure of $18,857,244 to $21,001,841, depending on the biosolids storage option utilized, for construction of both phases; the associated annual O&M and replacement costs described in Chapter 6; and the funding assumptions described in Chapter 8.

Implementation Schedule

The West Central Wisconsin Biosolids Facility intends to apply for funding through the Wisconsin Clean Water Fund (CWF) to finance Facility upgrades. The following implementation schedule is based on the timelines for this loan program and projections for the increased loadings to the Facility. The actual schedule may vary depending on the availability of financing, negotiations with member communities, and need for capacity increases.

Proposed Implementation Schedule

Action	Completion Date
Public Hearing on Plan	December 2020
Incorporate Public Hearing comments into the Final Facilities Plan	December 2020
Submit Facilities Plan to WDNR	December 2020
WDNR Approval of Facilities Plan	March 2021
Phase 1 Design	Dependent upon negotiations with member communities
Phase 1 Construction	
Phase 2 Design*	2028
Phase 2 Construction*	2029

*Tentative dates provided. Actual timing will depend on Facility loadings

1. INTRODUCTION

1.1 Planning Objectives

The intent of this Facilities Planning Document is to develop and evaluate viable alternatives for upgrade of the existing West Central Wisconsin Biosolids Facility (hereafter Facility) located in Ellsworth, Wisconsin. The Facility was originally constructed in 1997 to more efficiently process and re-use municipal wastewater sludge from 11 communities in the west central Wisconsin region. The plant underwent minor upgrades and expansion in 2008. The contributing communities have continued to grow steadily, such that additional capacity will be required to meet the Facility's needs for the next 20 years. Additionally, the Facility experiences issues associated with the volume of cake biosolids produced putting a strain on the cake biosolids storage and subsequent land application. The Facility has expressed a strong desire to maintain production of Class A biosolids, while reducing the end product volume.

1.2 Planning Area

The West Central Wisconsin Biosolids Facility is located in the southeast corner of the Village of Ellsworth, Wisconsin, centrally located in Pierce County. The Facility is located approximately 20 miles from the Minnesota-Wisconsin border and approximately 60 miles west of Eau Claire. Contributions to the Facility come from communities in seven Wisconsin counties, as well as a number of contributors from Minnesota. The contributing communities are listed below, and differentiated between member and non-member. Member communities were a part of the original planning, financing, and construction of the Facility and now have voting rights and are eligible to have a representative on the governing commission that oversees the Facility operations.

Members

- City of Amery
- Village of Baldwin
- Village of Ellsworth
- City of Hudson
- City of New Richmond
- Village of Osceola
- City of Prescott
- City of River Falls
- Village of Roberts
- Village of Somerset
- Village of Spring Valley

Non-Members

- Eleva-Strum Joint Sewerage Commission
- Village of Plum City
- Village of Hammond
- Travel Centers of America
- City of Mondovi
- Village of Pepin
- City of Mazeppa, MN
- City of West Concord, MN
- Downsville Sanitary District
- City of Lake City, MN

1.3 Facilities Plan Approach

The facilities planning process begins with an evaluation of the existing facilities in terms of both condition and biosolids loadings, followed by development of future design parameters using historical data and appropriate demographic projections. Alternatives are developed and compared to arrive at a viable and cost effective option that will meet the Facility's needs for the next 20 years.

Chapter 3 discusses known problems with the Facility's biosolids storage and Class A treatment systems. The evaluations considered known problems with the existing biosolids collection,

treatment and disposal systems, specifically with regards to capacity. This chapter presents a detailed evaluation of existing equipment and building conditions as well as an accounting of the existing loading data to the treatment facility. The baseline loading parameters for the facility include values for biosolids and centrate. Each community contributes their own volume of biosolids and must take back that same quantity of centrate. Exceptions are made for communities without sufficient capacity to receive centrate in return and those loads are distributed between willing communities, typically River Falls or Ellsworth, for the cost associated with treating that centrate.

Chapter 4 presents the projected loads for the Facility. Future loading increases, both biosolids and centrate, are based on current contributions from communities and observed gross growth of loadings to the Facility.

The design loads presented in Chapter 4 are used to develop preliminary design alternatives for meeting future needs. These alternatives are presented in Chapter 5 and compared in Chapter 6. Alternatives specifically consider means to address anticipated future capacities and changes to technology that may be necessary to continue treatment and disposal of biosolids in a code compliant manner. The cost evaluation does not consider costs to replace existing pieces of equipment that have reached the end of their useful lives, as generally these pieces of equipment will be necessary to continue treatment into the future, regardless of treatment approach or expansion necessary. Additionally, the Facility has a robust capital improvements budgeting process to cover replacement of aging or failed equipment items.

Alternatives must have the capacity to meet the anticipated loadings to the facility as well as address concerns such as odor control, safety, and overall efficiency of the facility. Storage of both centrate and biosolids, biosolids treatment technology, final product quantity, operator safety, and odor control were the main concerns addressed in the alternatives.

The selection of the recommended alternative is based on both economic and non-economic evaluations in Chapter 6. The economic analyses include capital, operation and maintenance and 20-year present worth cost evaluations for each alternative. Non-economic evaluations consider such factors as ease of operation, future growth potential, and an environmental assessment.

Chapter 7 presents the potential environmental impacts and mitigative measures for the recommended alternative. Potential funding sources and impacts to user rates are described in Chapter 8. This chapter also presents an estimated schedule for implementation based on the anticipated timelines for design and construction as well as adequate time for the Facility to secure project funding and undertake the associated debt load.

2. DESCRIPTION OF PLANNING AREA

The following sections describe the features and setting for the West Central Wisconsin Biosolids Facility, shown in Figure 2-1. The Facility site is located at 677 Bio Ave on the southeastern side of the Village of Ellsworth.

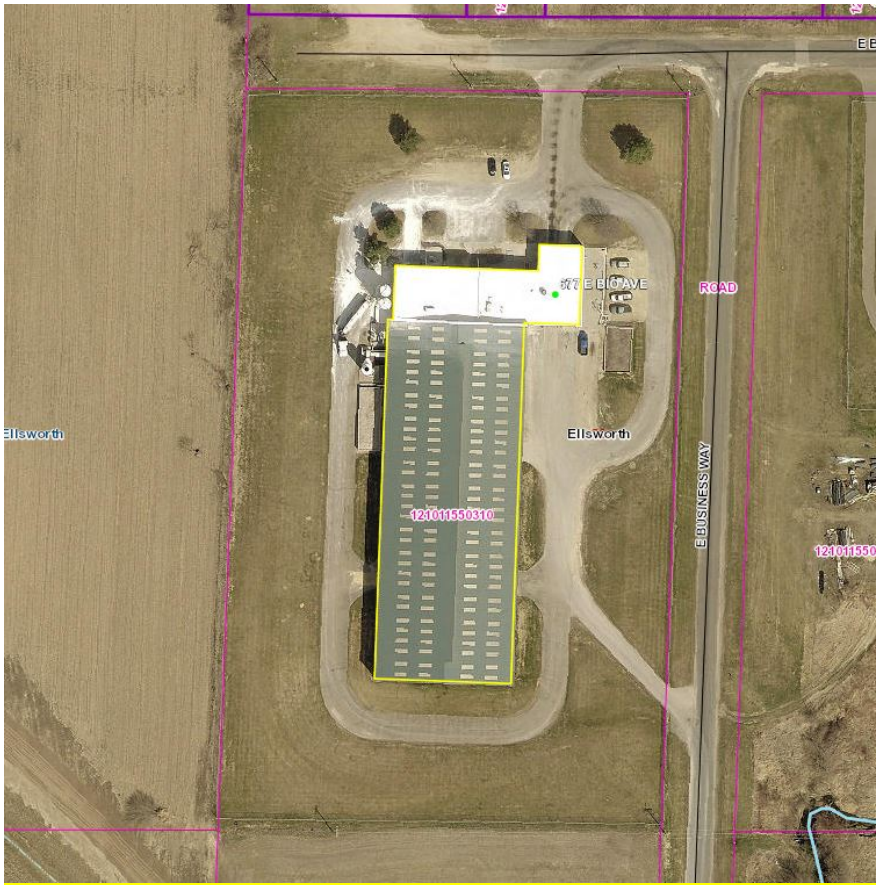


Figure 2-1 The West Central Wisconsin Biosolids Facility Site

2.1 Climate

Typical of the Great Lakes region, the Facility experiences cold and snowy winters, hot summers, and moderate springs and autumns. The temperature ranges from an average of 19°F in January to 71°F in July. The majority of rain falls in April through September. Typically, the month of June is the wettest and January is the driest month.

2.2 Physical Setting

The West Central Wisconsin Biosolids Facility is located in the unglaciated portion of Wisconsin. The Land Type Associations (LTA) of Wisconsin classifies the surficial geology of this area as River Falls Eroded Moraines and Baldwin Moraines. Each are characteristic of undulating till plain. Soils are moderately well drained silty soils over acid clay loam till. Common habitat types include ATiSa-De, ATiCa-La and wetland.

Elevations at the Facility site are approximately 1040 feet above mean sea level (AMSL) according to digital topographic maps available on the Pierce County GIS site. Within the Village of Ellsworth, elevations reach approximately 1240 feet AMSL.

2.3 Soils

The Natural Resources Conservation Service (NRCS) soil resource report for the existing Facility site and the vicinity is included in Appendix A. The entirety of the site owned by the Facility is characterized as Ella silt loam, with 1 to 6% slopes. The soil is classified as moderately well drained and has a high available water capacity.

2.4 Water Resources

The only surface water resource near the planning area is Isabelle Creek within the Lake Pepin Watershed (HUC 10= 0704000107). The Facility does not have a liquid effluent discharge or outfall and thus has minimal impact to the adjacent creek.

2.5 Floodplain Surveys

Flood Hazard Boundary Maps produced by the Federal Emergency Management Agency (FEMA) were reviewed for the existing site using the DNR's surface water data viewer. Based on available information, the developed portion of the existing Facility site lies in an area of minimal flood hazard and outside of the 100-year flood plain delineation. A floodplain map of the Facility site is included in Appendix B.

Flooding has not been noted or recorded for the existing structures. All new structures shall be located with first floors at least 2 feet above the mapped 100 year flood plain.

2.6 Wetlands

Based on a review of available resources, including the WDNR Surface Water Data Viewer and Wetland Inventory, there are no mapped wetlands on the existing Facility site. The inventory does identify a wetland delineation confirmation and wetland indicators along Isabelle Creek, both east and south of the facility site and any construction related extents. A map of the wetland indicators in proximity to the existing Facility site is provided in Appendix B.

2.7 Groundwater

Groundwater is the sole source of residential water supply in Pierce County and it also sustains area lakes, streams, and wetlands. Groundwater resources in the in area consist of the unconsolidated sand and gravel aquifer and underlying bedrock aquifers. The upper bedrock is made up of sandstone and dolomite and includes the Sinnipee and Ancell Groups, where present, and the Prairie du Chien, Trempealeau, and Tunnel City Groups. Several subregional confining units are identified within the upper bedrock aquifer, including the base of the Tunnel City Group. The Wonewoc Formation underlies the shaly base of the upper aquifer (the base of the Tunnel City confining unit) and forms the thin Wonewoc aquifer. Several shaly facies within the Eau Claire Formation underlie the Wonewoc aquifer and form the Eau Claire confining unit. The Mount Simon Formation forms the lower bedrock aquifer that overlies Precambrian crystalline basement rock. The Precambrian crystalline basement rock is assumed to be impermeable and forms the lower boundary of the groundwater-flow system. Most municipal and private water-supply systems use the upper bedrock aquifer or the sand and gravel aquifer where it is sufficiently thick.

2.8 Agriculture

Of the 10 acres owned by the Facility, approximately 4 acres on the southern end of the parcel are farmed. Within the fenced portion of the parcel, where daily operations occur, there is no active farming or agricultural activity. Contact will be made with the State of Wisconsin Department of Agriculture, Trade and Consumer Protection with regards to the potential impacts

to agriculture land should a decision be made to use land outside of the current Facility site. This will be covered in more detail in Chapter 7.

2.9 Historic and Cultural Assessment

The extent of historic and cultural assets at the proposed work sites are covered in detail in Chapter 7 of this planning document.

2.10 Contributing Areas

The Facility accepts biosolids from 11 member communities as well as 10 other non-member communities and a travel center, as previously listed in Section 1.2. The 11 member communities are located within 3 surrounding counties to the Facility: Polk, St. Croix, and Pierce. The 10 additional non-member contributions come from communities in Trempealeau, Buffalo, Pepin, and Dunn Counties in Wisconsin, and communities in southeastern Minnesota. In order to develop future loading projections, the Facility elected to utilize influent loading data and trends in lieu of developing individual loadings for each of the contributors. An analysis of the contributions and trends is provided in Section 3.3.

3. DESCRIPTION OF EXISTING FACILITIES

As stated in Section 1.1, the West Central Wisconsin Biosolids Facility has equipment and processes that need updating. This chapter covers the conditions of the following key components of the Facility: the facility and equipment condition, facility capacity evaluation, and current loadings.

3.1 Description of Existing Facilities – Biosolids Facility

In 1997, the Wisconsin DNR limited the spread of municipal biosolids, requiring that biosolids not be land applied on frozen or snow covered ground. This required municipalities to provide 180 days of storage for biosolids to ensure compliance with this requirement. These regulations prompted officials in 11 Wisconsin cities and villages to join together and finance, build, and operate a biosolids processing facility to more effectively deal with municipal wastewater sludge within the region. The Facility receives liquid biosolids from the contributing communities, processes, treats, and disposes of treated biosolids, and returns centrate and other process water back to the contributing communities.

The Facility was constructed in 1997 to accept biosolids for processing and eventual land application. The original facility consisted of a drive through garage with operator interface for biosolids unloading to a sludge screen, followed by discharge into one of two biosolids storage tanks. Biosolids brought to the Facility come from a combination of primary sludge and waste activated sludge, some of which had been partially digested and/or polymer thickened. Sludge mixing pumps were installed in the two storage tanks for recirculation of the biosolids prior to treatment. Two sludge feed pumps in the basement of the Facility, adjacent to the storage tanks, draw sludge from the bottom of the tanks and pump biosolids to a centrifuge for dewatering. Polymer addition to the liquid biosolids stream occurs upstream of the centrifuge. Cake solids from the centrifuge were discharged from the hopper to a cake sludge conveyor. The liquid waste, centrate, from the dewatering process is held in additional centrate storage tanks before being pumped back into trucks for hauling to contributor community's wastewater treatment plants. Biosolids were treated to Class A standards with a CemenTech CSP-30 sludge processor where kiln dust and quicklime were added to destroy pathogens in the biosolids. Class A biosolids discharged from the system were collected in a bunker and moved throughout the storage shed with an end loader to stockpile the product until land application could occur. Odor control at the Facility was accomplished with a chemical scrubber, utilizing sulfuric acid, rated for 27,000 cfm of air before being discharged to the atmosphere. Additional spaces within the original Facility construction include office space, a lunch/conference room, a laboratory, mechanical and control rooms, and locker and restrooms.

In 2008, the Facility undertook planning for upgrades to replace the existing CemenTech lime stabilization process. At that time, ten alternatives were considered, including using the existing process with new equipment, installing a new lime stabilization process, sludge drying only or drying with lime stabilization, various sludge digestion alternatives, and consolidation. The selected alternative was to convert the Facility to utilization of a different lime stabilization process. The selected alternative resulted in the installation of a Bioset process, manufactured by Schwing-Bioset. The Bioset process is an alkaline stabilization/pasteurization process that uses quicklime and sulfamic acid as additives to the dewatered biosolids. This is then pumped through an enclosed reactor where the high temperature and high pH kills the pathogens. The final product is stored in an enclosed storage building until it is land applied. The totally enclosed process has had considerable positive impact on the Facility, specifically related to working conditions and

dust problems when compared to the previous CemenTech process. The Bioset process was originally designed to comply with the EPA Part 503 Biosolids Rule via Alternative 1 – Thermally Treated Biosolids for pathogen reduction and Option 6 – Addition of Alkaline Material for vector attraction reduction. Since installation, the Bioset process has received approval of a reduced temperature operating condition and now utilizes special approvals via Alternative 6 – Biosolids Treated in a Process Equivalent to a PFRP.

In 2009 the Facility undertook an odor evaluation study to identify issues with current odor control technologies and receive recommendations for optimization. Following the study, the Facility completed all of the feasible recommendations related to the existing odor control equipment controls and upgrades. Yet, depending upon environmental conditions such as wind direction and temperature, influent loadings, or during final product hauling periods, the facility still occasionally receives odor complaints from nearby residents in the Village of Ellsworth and experiences significant odor and dust within the Facility creating poor working conditions for operators.

Many of the existing processes, equipment, and tankage are still in use, with various equipment upgrades and Facility improvements being completed since the original Facility construction. Additional odor control and treatment areas were added to the Facility in addition to the chemical scrubber including two mulch style biofilters, one for exhaust air from biosolids and centrate storage tanks, and one for odorous air exhausted from the Class A biosolids discharge bunker. A drive on truck scale was added to the biosolids receiving garage to record weights of biosolids loads being discharged at the Facility and centrate loads being removed. An additional centrifuge has been added to the process since the Facility's inception, as well as installing a Facility Supervisory Control and Data Acquisition (SCADA) system in 2016 to monitor and control the processes of the Facility.

Included in Appendix C is site plans of the existing Facility. Existing equipment and individual processes are described in more detail below.

3.1.1 Buildings and Grounds

The following processes are present at the West Central Biosolids Facility, with the construction dates as noted:

1 – Solids Unloading, Truck Handling, Screening (1997), Truck Scale (2000)
2 – Raw Sludge Storage (1997)
3 – Sludge Pumping and Dewatering (1997)
4 – Class A Sludge Treatment (2008)
5 – Sludge Storage (1997)
6 – Centrate Storage and Pumping (1997)
7 – Odor Controls – Chemical Scrubber (1998), East Biofilter (2009), West Biofilter (2010)

All of the major structures and buildings are over 20 years old, but appear to be in good condition. Major concerns with the Facility are related to equipment capacity, facility processes and capacity, safety, and facility needs. A system model has been developed for the Facility and is used to identify deficiencies in the process related to biosolids and centrate loadings. The system model is included in Appendix G for reference. Upgrades to equipment will be discussed in the following sections of this report.

3.1.2 Biosolids Unloading, Truck Handling, Screening

The first process at the West Central Wisconsin Biosolids Facility is unloading of biosolids from hauler trucks. Inside of the garage, located on the east side of the Facility, a single truck scale weighs trucks before and after emptying to determine the quantity of biosolids offloaded. The truck scale, which was most recently replaced in 2012, has a maximum weight of 270,000 pounds with a maximum concentrated load capacity of 90,000 pounds. The scale is supported on eight load cells, which are supported by a 12" elevated concrete slab with steel columns beneath the slab, inside of the biosolids and centrate storage tanks.

Biosolids Unloading and Scale

Following a weight measurement on the scale, haulers connect a discharge hose to the 6" unloading line that directs biosolids to the sludge screen. The screen is manufactured by Lakeside Equipment and has a rating of 470 gallons per minute at 5% solids concentration, though this capacity has not been realized by the existing unit. The existing screen was rebuilt in the summer of 2020 following a failure within the gearbox. Bypass piping and valving is in place for when the screening equipment is out of service, or for conditions when the screen becomes blinded by debris in the influent biosolids. Screenings removed by the equipment are discharged to a dumpster and hauled offsite for disposal at a landfill. After screening, biosolids are discharged through 8" piping to the storage facilities below grade.

Screening Equipment

To provide for additional unloading capacity at the garage, an additional scale and screen should be installed. At current conditions, coupled with the centrate loading times described in Section 3.1.7, haulers spend approximately 35 to 40 minutes at the scale. Although hauling occurs almost 24 hours per day, trucks occasionally back-up at the garage due to the single scale and limited screening capacity. For future growth, a second scale and screen should be installed at the receiving garage. This would also address concerns with the existing scale as it appears to be reaching the end of its useful life, has issues during calibrations, and lacks redundancy to ensure continued hauling and measurement for the purposes of billing.

At current loadings, based on Facility data provided in Appendix D and the system model provided in Appendix G, the approximate biosolids unloading, loading, and screening process and duration is as follows:

- Annual Average — 10 loads per day, 6.6 hours per day of scale use
- Maximum Week — 13 loads per day, 8.6 hours per day of scale use
- Maximum Day — 17 loads per day, 11.2 hours per day of scale use

3.1.3 Raw Biosolids Storage

Following unloading and screening, raw biosolids are discharged to one of two below grade concrete tanks for equalization and storage. Four tanks are located beneath the garage, however two are currently designated for use of centrate holding, further described in Section 3.1.7. Each tank is 56 feet long, 16 feet 4 inches wide, and operates with a side water depth of approximately 10 feet, for a capacity of approximately 68,000 gallons per tank.

Each tank bottom is sloped to a sump where a submersible mixing pump is located. The first tank has a 25 horsepower (HP) Flygt submersible pump. The second biosolids storage tank has a 28 HP ABS submersible pump. These pumps mix the biosolids by pumping it through a 6” header located at the top of the tank and discharge it through two (2) 4” plug valves. The valves have not been operational since 1997 and should be replaced. The biosolids mixing header for the pumps was originally constructed, so in the event that a pump is out of service or a tank needs to be

pumped to the adjacent one that can be accomplished with manual valve changes. However, this is not operational and should be considered for improvements to increase flexibly in tank usage.

Improvements to the biosolids holding tanks and mixing strategy have occurred due to inconsistent feed solids to the dewatering process. These improvements have aided in improving the consistency of solids pumped to the centrifuges, but further optimization is warranted.

Biosolids Storage Tanks

Based on current loadings and historical maximum week and maximum day loadings, biosolids storage space within the two tanks becomes limited. When considering biosolids receiving occurring without any pumping out of the biosolids storage tanks, the Facility is near capacity at maximum day loading events. The data analysis for the biosolids storage tank capacity is provided in Appendix G. For future growth and to allow for redundancy in tankage, additional biosolids storage tankage should be accounted for.

- Annual Average 53% of capacity utilized
- Maximum Week 73% of capacity utilized
- Maximum Day 93% of capacity utilized

3.1.4 Biosolids Pumping

Following the biosolids holding tanks, two rotary lobe pumps are used to transfer sludge to the dewatering centrifuges. Each pump is a 20 HP Boerger with a manufacturer rating of 300 gallons per minute (gpm) at 40 psi discharge pressure. The pumps are each operated on VFDs to allow operations to vary speed and the subsequent flow to the centrifuges. The Facility observes a maximum capacity of each pump at 200 gpm while operating at 50% speed due to sludge characteristics and the hydraulic limitations of 4” discharge piping. The pumps are rebuilt annually, when the flow output from the pump is reduced to 170 gpm while operating at 90% speed.

Biosolids Pumping

Under current normal operating conditions, a single biosolids pump is capable of providing the necessary flow rate to feed a centrifuge. Based on a 10 hour work day, only the current maximum day loadings result in a biosolids pumping flow rate requirement greater than the observed capacity of 200 gpm.

- Facility observed equipment rating 200 gpm
- Annual Average pumped flow required 145 gpm
- Maximum Week pumped flow required 166 gpm
- Maximum Day pumped flow required 212 gpm

As loadings to the Facility increase and the need for additional biosolids holding tanks and centrifuge capacity occurs, the biosolids pumping capacity should be increased to provide three pumps, where two are operational and the third provides required redundancy. Upgrades to the space should also address increasing the pipe sizes to minimize headloss and hydraulic deficiencies.

As a part of biosolids pumping prior to dewatering, ferric chloride is added to the suction side of both the rotary lobe pumps with peristaltic chemical feed pumps. This is used to reduce the phosphorus in the centrate and to adjust the pH of the biosolids to improve dewaterability. Potassium permanganate is also added to reduce odors generated from the process. Future upgrades should include a dedicated chemical feed structure to ensure code compliant storage and ventilation, segregation of chemicals, and separation from vital process equipment.

3.1.5 Biosolids Dewatering

Biosolids pumped from the biosolids holding tanks are discharged into one of two dewatering centrifuges at the Facility. An Alfa Laval centrifuge is operated minimally, typically once per month to exercise the equipment, and serves as a redundant unit for the dewatering process. The main drive of the Alfa Laval centrifuge is 150 HP and the back drive is 30 HP.

The primary centrifuge used at the Facility is manufactured by Centrisys. The main drive is 75 HP and the back drive is 15 HP.

Centrate that is generated from the dewatering process flows by gravity into one of the two centrate holding tanks adjacent to the biosolids holding tanks. Centrate handling is described further in Section 3.1.8.

To minimize electrical operational expenses, the Facility does not operate both centrifuges simultaneously. The Facility has seen that running both units during peak electrical rate hours substantially increases operating expenses.

Polymer is added upstream of the centrifugation process to aid in dewaterability of the sludge. Polymer is stored on-site, adjacent to the centrifuge room. Typical consumption of polymer allows the Facility an approximate 10 day window in which a full truckload can be delivered. Future additions to polymer storage could allow for more ability to cost effectively receive polymer shipments. Typically, sludge is fed to the dewatering process at approximately 2 to 3% solids and cake solids discharge is approximately 22%. Sludge feed solids and cake solids concentration data is provided in Appendix D, in addition to daily polymer consumption data.

Sludge Dewatering: Centrisys and Alfa Laval Centrifuges

Similar to sludge pumping, the current loadings to the centrifuge can be accommodated without exceeding the maximum capacity of the equipment. Loadings to the equipment is rated based on solids loading in pounds per hour (lbs/hr) and feed rate in gpm.

- Centrisys Maximum Rated Loading Rate — 3,000 lbs/hr at 2.4% solids
- Centrisys Maximum Rated Feed Rate — 250 gpm at 2.4% solids
- Centrisys Optimum Rated Loading Rate — 2,000 lbs/hr at 2.0% solids
- Centrisys Optimum Rated Feed Rate — 200 gpm at 2.0% solids
- Centrisys Facility Observed Feed Rate — 200 gpm

- Alfa Laval Rated Loading Rate — 2,813 lbs/hr at 2.5% solids
- Alfa Laval Rated Feed Rate — 225 gpm at 2.5% solids

- Alfa Laval Facility Observed Feed Rate 200 gpm

- Annual Average Loading Rate 1,864 lbs/hr at 2.55% solids
- Annual Average Feed Rate 145 gpm at 2.55% solids
- Actual Maximum Week Loading Rate 2,107 lbs/hr at 2.55% solids
- Actual Maximum Week Feed Rate 166 gpm at 2.55% solids
- Actual Maximum Day Loading Rate 2,749 lbs/hr at 2.55% solids
- Actual Maximum Day Feed Rate 212 gpm at 2.55 % solids

As loadings to the Facility increase, additional dewatering capacity will be required. Larger centrifuge equipment would be necessary to refrain from continuous operation at a manufacturer rated maximum condition. Piping modifications would also be recommended to include diversion piping so that a plug can be more efficiently developed each day at equipment startup. With any dewatering upgrade, the existing polymer skid should be replaced as well.

Following the dewatering process, cake sludge from either centrifuge is transported by a common dewatered sludge conveyor. Future modifications to accommodate dewatering capacity would require modifications to the conveyor to continue to capture cake solids discharged from the units.

3.1.6 Class A Sludge Treatment

In order to achieve Class A Exceptional Quality biosolids under the US EPA Part 503 rule, the Facility utilizes a lime stabilization process manufactured by Schwing Bioset. Cake solids from the dewatering centrifuges are conveyed to the inlet hopper of the Schwing Bioset system. The hopper discharges to a conveying auger where calcium oxide (quicklime) is added and mixed with the cake solids to elevate the pH and promote an exothermic reaction to increase the temperature of the mixture. Sulfamic acid is added to the lime solids to further promote exothermic reaction of the mixture. The Bioset pump then pumps the lime solids into a reactor sized for a 60 minute detention time. As a process to further reduce pathogens (PFRP) the Bioset process is required to operate with a minimum 40 minutes solids retention time in the reactor at a minimum temperature of 55 degrees C (131 degrees F).

The Bioset system is designed to process 16,429 wet pounds of feed sludge per hour. The Bioset pump is capable of 9 strokes per minute, with 6.7 gallons per stroke and a manufacturer efficiency rating of 70%, resulting in approximately 42 gpm being discharged from the pump. The hydraulic power unit for the process is a 40 HP motor and has a reservoir capacity of 115 gallons. The pressurized Bioset reactor is 48” in diameter and 25’ long and designed with a two times safety factor, per the manufacturer. Sulfamic acid is held in a hopper that has the capacity to hold 3 cubic feet of dry sulfamic acid. The lime, cake, and sulfamic acid hopper are located above the twin screw mixer that consists of a twin-auger screw feeder. This is used to feed a homogenous mixture to the reactor feed pump.

Class A Sludge Treatment System

The Bioset system adequately serves the Facility at current conditions, including the maximum day loadings. However, if loadings increase the manufacturer has indicated that a 60 HP power unit could be installed to increase capacity of the pump to 52 gpm.

• Feed Sludge Rating	16,429 wet pounds per hour
• Actual Annual Average	8,352 wet pounds per hour
• Actual Maximum Week	9,289 wet pounds per hour
• Actual Maximum Day	12,122 wet pounds per hour
• Bioset Pump Rating	42 gpm
• Annual Average	18 gpm
• Maximum Week	20 gpm
• Maximum Day	26 gpm
• Reactor Vessel Rating	60 minutes
• Annual Average	129 minutes
• Maximum Week	116 minutes
• Maximum Day	89 minutes

Dry lime is introduced to the Bioset system with an individual 6” diameter shafted screw conveyor, powered by a 5 HP motor, from each of the two lime silos. The lime conveyor is capable of adding approximately 57 pounds of lime per minute to the process. Each silo is rated for 2,100 cubic feet of lime, for a total storage capacity at the WCWBF of 4,200 cubic feet.

Lime Silos

The lime feed and storage system adequately meets the current needs of the Facility.

- Lime Conveyor Feed Rate 57 pounds per minute
- Actual Annual Average 16 pounds per minute
- Actual Maximum Week 17 pounds per minute
- Actual Maximum Day 23 pounds per minute

- Actual Annual Average Lime Storage 9.1 weeks
- Actual Maximum Week Lime Storage 6.7 weeks
- Actual Maximum Day Lime Storage 5.1 weeks

3.1.7 Sludge Storage

Class A sludge at approximately 30% solids is discharged from the Bioset reactor to the floor of the sludge storage shed. An end loader is utilized to transport the sludge to the far back (southern) end of the shed and is filled in to the north as more product is produced prior to land spreading. The shed is 115 feet wide by 323 feet long. To allow for truck and loader traffic in the space, sludge storage is assumed to utilize 220 feet of the 323 feet long space. Stacks of treated sludge are assumed to be up to 8 feet high. Therefore, the approximate total storage capacity of the shed is 7,496 cubic yards for treated cake sludge.

Dried Sludge Storage

In recent years the WCWBF has struggled to fully empty the storage shed in spring and fall hauling windows due to limited field access and wet condtions. This has meant that a carryover of sludge has occurred and reduces the useable space following the close of a spring or fall hauling window. As the issue compounds, the Facility continues to lose valuable storage space until a hauling period allows for a full emptying of the storage shed.

Without considering these reduced capacity considerations above, the Facility is still nearing the need for additional storage capacity to meet the required 180 day storage. As loadings to the WCWBF increase, consideration of additional storage may be required depending upon treatment tehcnology chosen.

- Actual Annual Average Storage Capacity 266 days
- Actual Maximum Week Storage Capacity 194 days
- Actual Maximum Day Storage Capacity 149 days

If the current lime stabilization process continues to be used for developing Class A biosolids, the Facility should consider additional storage capacity to ensure sufficient space exists between hauling periods. Exploration of biosolids drying technology should also be considered as a way to produce dryer biosolids that require less storage space than the current product.

3.1.8 Centrate Storage and Pumping

The majority of the centrate generated at the facility is the byproduct of the centrifugation processing of biosolids, however various other sources contribute to the liquid generation including polymer and make-up water, floor drains, and occasional spent odor control process water. Current operations utilize two of the four storage tanks to hold centrate prior to hauling offsite. A single 15 HP dry pit submersible Flygt pump is utilized for pumping centrate from either of the tanks to a sludge hauling truck for disposal at a contributor's wastewater treatment facility.

During periods of above average biosolids loading to the Facility, a subsequent increase in centrate volume has to be managed. The Facility is limited to two existing storage tanks for capacity which had previously provided sufficient volumes.

- Actual Annual Average 58% of capacity utilized
- Actual Maximum Week 79% of capacity utilized
- Actual Maximum Day 101% of capacity utilized

At current maximum daily loadings to the Facility, additional centrate storage is necessary. New centrate storage construction should be considered to allow for sufficient storage capacity. Additionally, arranging the additional/new tankage in a fashion to allow for removal of solids from the centrate would be beneficial to minimize returned loadings to the contributing communities.

3.1.9 Odor Control

To treat odorous gasses developed during the biosolids treatment process, WCWBF utilizes three treatment systems, two chip bed style biofilters and a chemical scrubber. The Bioset process has its own scrubber as well, however this is not operated due to its ineffectiveness noted by the Facility and the water demand and subsequent wastewater generated.

The northeast biofilter, named due to its location on the site, is a chip bed style biofilter that treats air at various flowrates depending on how the Facility is operating. Each of the four sludge storage/centrate holding tanks have an exhaust air duct that is connected to the odor control blower. While no equipment or unloading is occurring, 1,000 cfm is drawn from the storage tanks and blown through the biofilter for treatment. If a truck is unloading sludge but the dewatering centrifuge is off, the blower speed is increased to treat 1,500 cfm in the biofilter. If both a truck is unloading and a dewatering centrifuge is online, the blower speed is increased to discharge 2,000 cfm to the biofilter. The biofilter is 20 feet wide, 40 feet long, and has a media depth of 4 feet, for a total design capacity of 4,000 cfm of air at a 20 second empty bed residence time (EBRT). Air distribution piping in the biofilter consists of 4” PVC pipes spaced 4 feet on center with ½ inch holes drilled at 6 inch spacing. The pipes are wrapped in a filter cloth and encased in gravel. Soaker hoses are utilized to maintain sufficient moisture in the biofilter.

Northeast Biofilter

The west biofilter is also a chip bed style odor control biofilter, which treats odorous air from the sludge storage shed and discharge bay. An FRP Pressure Blower manufactured by New York Blower is powered by a 15 HP motor and rated for 3,000 cfm at 13 inches static pressure, provides air from the solids discharge bay to the biofilter. The biofilter is approximately 20 feet wide by 50 feet long and was rebuilt with similar media and aeration systems as the northeast biofilter.

West Biofilter

To treat the air from the large sludge storage shed, a 40 HP FRP Fume Exhauster fan from New York Blower draws air from the shed through a 48 inch duct. Air is then blown up through a 9 foot diameter by 28 foot tall chemical scrubber. The exhaust fan is rated for 27,000 cfm at 3 inches of static pressure. The chemical scrubber is a packed tower with polypropylene packing to expose odorous gas to sulfuric acid and water. A recycle pump recirculates oxidant solution, made up of water and sulfuric acid, at a rate of up to 425 gpm from the top of the scrubber. While in operation, a small stream of the recycled solution is wasted to the centrate tanks at approximately 0.5 to 1 1 gpm. Within the scrubber tower, the oxidant solution absorbs and oxidizes contaminates in the gas stream. A pH controller is utilized to vary the addition of sulfuric acid to maintain an acidic pH in the vessel between 4 and 6 SU. The sulfuric acid is housed inside, adjacent to the lime stabilization process. As a weekly maintenance item, spent solution from the chemical scrubber is discharged from the system and sent to the centrate tanks to be removed from the site.

Chemical Scrubber

All of the odor control technologies at the WCWBF should be considered for upgrade or replacement with future upgrades. The west and northeast biofilters have varying levels of treatment capability depending on the time of year and temperature. The soaker water for the wood chip media also has to be turned off seasonally due to the northern climate and thus performance is minimal until the spring. The Facility has expressed a strong desire to replace the chemical scrubber with alternative technology that does not require the usage and storage of dangerous chemicals like sulfuric acid. The chemical scrubber also has to be turned off during winter months due to freezing concerns. In addition to the odor control treatment processes at the Facility, the Facility-wide air handling and ventiliation should be evaluated for improvements due to the observed conditions inside of general spaces including the office, hallways, and conference room.

3.2 Existing Facility Evaluation

As described further in Sections 3.3 and 3.4, the plant is approaching, and will likely exceed, within a 10 year timeframe, capacity with respect to biosolids storage and processing capabilities as well as with centrate storage. The facility has been performing well, but several issues and improvements have been identified for further consideration in this facilities plan, as follows:

- Solids Unloading, Truck Handling, Screening
    - Expansion of the existing garage
    - Addition of a second truck scale
    - Addition of a second sludge screen
- Raw Sludge Storage
    - Conversion of centrate holding tanks to sludge holding tanks
    - Install mixing equipment into remaining holding tanks
    - Modify floor slopes in holding tanks for improved mixing and pumping
- Sludge Pumping
    - Replace existing rotary lobe pumps
    - Install a third rotary lobe pump for increased capacity
    - Reconstruct discharge piping headers with increased diameter piping
    - Construct new chemical feed facilities to increase Facility staff safety and reduce corrosion concerns in the dedicated pumping spaces
- Sludge Dewatering
    - Replace existing dewatering centrifuges with larger capacity units
    - Modify or replace the existing cake solids conveyor to fit larger centrifuges
- Class A Sludge Treatment
    - Consider increasing the power unit capacity
- Sludge Storage
    - Consider construction of additional biosolids storage space
- Centrate Storage and Pumping
    - Construct new covered centrate storage tankage
    - Utilize new construction to further remove centrate solids prior to hauling
- Odor Controls
    - Optimize or replace the existing chip bed biofilters for stable, year-round performance
    - Replace the chemical scrubber with technology that can provide safe and reliable treatment of odorous gases

3.3 Existing Sludge Loadings from Facilities

The existing and current loadings to the West Central Wisconsin Biosolids Facility have been evaluated and are summarized on a daily, weekly, monthly, and annual basis, as detailed in Table 3-1. To better project future loadings to the Facility, as described in Chapter 4, previous loadings from 2008 were included in the evaluation.

Table 3-1 Existing Facility Loadings

		Loadings-2008	Loadings-2018
Maximum Day			
	Gallons	121,407	128,431
	Pounds	19,843	28,112
Maximum Week			
	Gallons	415,155	439,153
	Pounds	78,208	96,467
Maximum Month			
	Gallons	1,798,289	1,730,960
	Pounds	350,072	357,249
Annual Average			
	Gallons	20,177,282	18,851,137
	Pounds	3,511,115	3,781,833

Loadings from 2008 were evaluated as a part of the Engineering Report Facilities Upgrade, dated March 2008. Loadings from 2018 were summarized using plant data, provided in Appendix D, as follows:

- Daily loadings: Average of the three maximum days for 2017 and the three maximum days for 2018
- Weekly loadings: Average of the maximum weeks from 2016 through 2018.
- Monthly loadings: Average of the maximum months from 2013 through 2018
- Annual loadings: Average of the total biosolids processed from 2013 through 2018

The maximum daily loadings to the Facility indicate the highest volume or load of biosolids recorded in a given calendar day. Maximum weekly loadings to the Facility are analyzed from Sunday through Saturday for a given calendar week. Monthly and annual loadings similarly are analyzed using the calendar month or full calendar year, respectively. The daily, weekly, and monthly values for gallons and pounds are independent of one another that is they do not necessarily occur on the same day, week, or month.

In general, long term average trends at the Facility show that the volume of biosolids hauled in increased moderately from the 2008 plan on maximum day and maximum week periods, but decreased when viewing longer periods of monthly and yearly averages. Conversely, the pounds of solids hauled to the Facility increased more substantially and across all averaging periods. Many contributing communities to the Facility have implemented thickening practices at the respective wastewater treatment facilities. These efforts decrease the volume of water hauled to the Facility but increase the solids concentration and thereby increase the total pounds of solids to be processed.

Based on the analysis of trends over the 10 year period between loading evaluations, the annual growth percentage for each averaging period was determined for both biosolids volume and

pounds. A summary of the annual trends between the 2008 and 2018 analysis periods is below in Table 3-2.

Table 3-2 Facility Loading Growth Summary

	Annual Growth Percentage	
Averaging Period	Volume (gal)	Loading (lbs)
Maximum Day	0.5%	3.3%
Maximum Week	0.8%	1.9%
Maximum Month	-0.4%	0.1%
Annual Average	-0.7%	0.6%

The municipal biosolids brought to the Facility from the eleven member communities makes up about 75% of the total volume received by the Facility. The annual average daily loadings from each facility, and resulting Facility totals can be found in Table 3-3.

Table 3-3 Annual Average Sludge Loadings (2013-2018)

Facility	Average Sludge Loadings (% solids)	Average Sludge Loadings (gal)	Average Sludge Loadings (lb)
Members			
City of Amery	2.63	7,652	1,710
Village of Baldwin	3.01	10,375	2,750
Village of Ellsworth	1.88	14,287	2,319
City of Hudson	3.06	11,391	2,959
City of New Richmond	2.83	11,373	2,682
Village of Osceola	1.89	9,060	1,391
City of Prescott	3.51	7,610	2,230
City of River Falls	2.77	14,085	3,204
Village of Roberts	3.26	7,020	1,876
Village of Somerset	1.42	7,523	889
Village of Spring Valley	1.29	7,623	817
Member Totals		54,798	11,821
Non- Members			
Eleva/Strum Village Hall	1.58	7,999	1,076
Plum City	0.91	7,761	577
Village of Hammond	1.98	7,100	1,169
Travel Centers of America	0.38	7,691	249
City of Mondovi	2.33	7,481	1,441
Village of Pepin	0.97	12,016	940
City of Mazeppa	2.69	13,838	3,214
City of West Concord	2.38	6,709	1,366
Downsville Sanitary District	3.28	6,706	1,788
City of Lake City	2.84	8,037	1,880
Non-Member Totals		18,896	3,130
Facility Totals		69,380	13,950

Additional communities have inquired about contracts with, or occasional hauling to, the West Central Wisconsin Biosolids Facility. These communities have been turned away due to current capacity concerns. The consideration of long term capacity for additional communities was not considered as a part of this plan. However, when capacity issues are addressed, this could open up the possibility of allowing more communities to haul to the Facility.

3.4 Existing Centrate Generation and Loadings

Centrate generation impacts the Facility's ability to utilize storage space and efficiently utilize hauling trucks, especially on days or weeks of increased biosolids loading to the Facility. If centrate volumes exceed what the Facility has storage capacity for, empty trucks are required to haul centrate out, reducing the efficiency of the process and increasing transportation expenses. Data from 2015 through May of 2019 was analyzed to establish existing annual averages,

maximum months, and maximum and minimum weeks and days. A summary of the centrate generation quantities is found in Table 3-4.

Table 3-4 Existing Centrate Generation Summary (2015-2019)

	Annual Average *kgpd*	Min Day *kgpd*	Min Week *kgpd*	Max Day *kgpd*	Max Week *kgpd*	Max Month *kgpd*
2015	71	4	48	143	116	83
2016	71	6	24	144	96	81
2017	74	6	8	139	110	87
2018	77	6	45	148	129	92
2019	81	6	45	137	108	106
Average	75	6	34	142	112	90
Maximum	81	6	48	148	129	106

Centrate sampling and laboratory analysis occurs approximately once per week for BOD, TSS, ammonia, and phosphorus concentrations. Daily loadings for the bulk centrate are then calculated utilizing the measured concentration for the next seven days, or until another sample is taken. An annual average summary of daily centrate volume and loadings is presented in Table 3-5 and additional centrate data is provided in Appendix D.

Table 3-5 Annual Average Centrate Loadings (2015-2019)

	Flow *kgpd*	BOD *lbs/d*	TSS *lbs/d*	NH3 *lbs/d*	Total P *lbs/d*
2015	71	216	132	230	16
2016	71	368	207	223	10
2017	74	545	319	252	4
2018	77	622	161	251	4
2019	81	1,030	157	296	2
Average	75	557	195	250	7
Maximum	81	1,030	319	296	16

Typically, centrate is hauled to the next location on the hauler's route for a biosolids pickup. In some cases, excess centrate is hauled to the City of River Falls or Village of Ellsworth wastewater treatment facility due to available capacity and to ensure sufficient biosolids storage volume exists at the Facility.

4. FUTURE DESIGN CONDITIONS

4.1 Facility Growth

In 2008, the loadings to West Central Biosolids Facility were analyzed and used to predict future growth. This analysis looked at each contributing community individually and calculated the projected growth within each community and compared the total loadings to the Facility and historical trends, utilizing an overall Facility growth of 2% annually. In 2018, data regarding the overall loadings to the Facility was again analyzed and the 2% annual trend appeared to be an accurate representation of continued growth trends, as presented in Section 3.3. In general, trends for daily and weekly loadings increased at or above 2% per year between evaluation periods for biosolids loading to the Facility. Monthly and annual loadings increased less, closer to 0.5% per year. The volume of biosolids hauled to the Facility increased less when compared to solids loadings, and actually decreased on monthly and annual periods, but was also assumed to grow at 2% per year to ensure sufficient storage exists for the increasing loadings to the Facility. This yearly increase is what was used in this report to project future loadings from the existing 2018 data.

In order to develop future conditions in which to base the process designs and equipment, it was assumed that the volume and loadings were to increase 2% per year and that no changes to the number of member or non-member communities would occur. This means that no new communities will be contributing, and no existing facilities (member or non-member) will discontinue utilizing the Facility. Based upon the historical loading trends and the complexity and time associated with forecasting individual community loadings, only the annual growth rate was used to project 20 year loadings for the Facility.

4.2 Projected Biosolids Loadings

Loading and volume projections have been prepared for future annual average, maximum month, maximum week, and maximum day scenarios. Annual average projections were based upon a 2% per year increase from the 2018 loadings which were developed from volume and loading data from 2013 through 2018. Maximum month projections were based upon 2% per year growth from the 2018 loadings derived from data from 2013 through 2018. Maximum week projections for the design period are based on an annual 2% increase from the 2018 loadings based on data from 2016 through 2018. Maximum daily projections account for a 2% annual increase from the 2018 loadings based on data from 2017 and 2018. The maximum week and daily analysis omitted data from prior to 2016 and 2017, respectively. For these cases, it was observed that the averaging period would capture values that skew the currently observed maximums and would not provide a representative value for the Facility's current loadings. It is to be noted that the loadings (pounds) of biosolids is not necessarily occurring on the same day as the volume projections, as the concentrations hauled to the Facility vary daily.

The future solid loadings projection calculations are provided in Appendix E and summarized in Table 4-1.

Table 4-1 Future Facility Loading Projections

		Existing Loadings	Projected Loadings from Existing 2.00% Per Year 2028	2038
Daily				
Volume	gallons	128,431	156,556	190,841
Loading	pounds	28,112	34,269	41,774
Weekly				
Volume	gallons	439,153	535,325	652,558
Loading	pounds	96,467	117,593	143,345
Monthly				
Volume	gallons	1,730,960	2,110,030	2,572,115
Loading	pounds	357,249	435,484	530,853
Annual				
Volume	gallons	18,851,137	22,979,431	28,011,798
Loading	pounds	3,781,833	4,610,034	5,619,606

Based on the existing loadings at the Facility, the process is at approximately 67% of the projected design loading for both volume and loadings, when compared to the 2038 projections. As the Facility continues to collect data on biosolids hauled to the site, the actual capacity usage compared to the projections may vary.

4.3 Projected Centrate Loadings

The projected centrate volumes for the West Central Biosolids Facility were calculated using the existing centrate generation values for the Facility with a 2.0% increase per year, as described for the biosolids projections. The current maximum daily centrate volume is based on an average of the maximum day per year from 2015 through 2018. Existing maximum weekly centrate volumes were calculated using the average of the three highest weeks that occurred between 2015 and 2018. Maximum months were calculated the same as the weekly analysis, using the average of the three high months that occurred between 2015 and 2018. The existing annual average volume of centrate was also calculated using the average of the three highest years between 2015 and 2018. Using these existing centrate volumes as the current condition for each averaging period, the 2% per year growth factor was applied to calculate projections for the design period. The future centrate projections calculations are provided in Appendix E and summarized in Table 4-2.

Table 4-2 Centrate Volume Projections

		Existing Volumes	2028	2038
Maximum Daily	gallons	142,003	173,100	211,008
Maximum Weekly	gallons	471,219	574,413	700,206
Maximum Monthly	gallons	1,913,881	2,333,010	2,843,926
Annual Average	gallons	19,245,879	23,460,620	28,598,364

4.4 Design Summary

Based on the existing Facility loadings and the projections of 2% per year annually during the design period, design loadings for the Facility were developed. A summary of the projected design parameters established in the preceding sections are given in Table 4-3.

Table 4-3 Design Loading Summary

Design Parameter	2028 Projections	2038 Projections
Biosolids Loading (lbs)		
Annual Average	4,610,034	5,619,606
Maximum Month	435,484	530,853
Maximum Week	117,593	143,345
Maximum Day	34,269	41,774
Biosolids Volume (gallons)		
Annual Average	22,979,431	28,011,798
Maximum Month	2,110,030	2,572,115
Maximum Week	535,325	652,558
Maximum Day	156,556	190,841
Centrate Volume (gallons)		
Annual Average	23,460,620	28,598,364
Maximum Month	2,333,010	2,843,926
Maximum Week	574,413	700,206
Maximum Day	173,100	211,008

The Facility has expressed a desire to pursue upgrades in a phased approach. As such, the 2028 projections are used for Phase 1 upgrades and the 2038 projections are used for Phase 2 upgrades. It is anticipated that Phase 2 construction would occur generally in the middle of the design period, around 2028, to ensure capacity exists for the following 10 years. If growth projections are below the estimated 2% per year, Phase 2 construction could occur later, or conversely could occur sooner if annual growth at the Facility exceeds 2% per year.

5. PROJECT ALTERNATIVES

5.1 Overview

As noted in Chapters 1 and 3, the purpose of this Facilities Planning Document is to evaluate alternatives for upgrading the existing West Central Biosolids Facility and for meeting current and future loading requirements. It is the Facility's intent to use a phased approach to address these issues. Design and construction are to include comprehensive upgrades to meet projected future loads and to address the most pressing issues identified for the current processes and equipment.

For the purposes of planning and comparison of options, the design load for Phase 1 of construction is assumed to be the Year 2028 projected loadings. Phase 2 of construction is assumed to be the Year 2038 projected loadings. The alternatives listed in this Chapter of the Facilities Plan refer to the Class A sludge production portion of the Facility's processes and occur in phases as well. However, as explained later in this report, many of the requirements of each phase are independent of the Alternatives.

This Facilities Planning Document does not evaluate the construction of a new facility because all of the existing tanks and structures are in relatively good condition and are expected to last for at least the next 20 years with the recommended repairs and modifications. The Facility wishes to maximize the use of existing structures/tankage to the greatest extent possible.

5.2 Summary of Upgrade Requirements

Any upgrade of the existing West Central Biosolids Facility must meet the acknowledged reasons for undertaking facilities planning, including the following:

- Ability to handle and process increased biosolids loadings to the Facility
- Adequately store the biosolids and centrate produced by the Facility
- Address the issues of insufficient process equipment, HVAC system effectiveness, and odor control.
- Implement changes which will make the working conditions a safer environment for facility staff.

The specific issues that have been identified for the Facility are summarized in Chapter 3 and are described in the following sections.

Capacity related improvements have been identified by utilizing a system model for the Facility and inputting 2028 and 2038 loading projections, previously described in Chapter 4, to determine capacity restrictions and bottlenecks in the process. Equipment upgrade design points have been determined to be based upon maximum week loading projections, with the understanding that maximum day loadings will require additional operation time beyond the current average of approximately 45 hours per week of biosolids processing or storage of biosolids to spread out processing time, unless otherwise noted.

5.3 Description of Plant Upgrade Phases

Based on a system model developed for the Facility, some unit processes require improvements or increases in capacity as a part of the Phase 1 construction, while others can be delayed to occur as a part of Phase 2 construction, if desired. Each of the phased processes is described below and is independent of the alternative analysis for the Class A biosolids treatment system.

5.3.1 Phase 1 – Upgrades for 2028 Design Loadings

Phase 1 process upgrades are required to effectively handle the current maximum loadings to the year 2028 projected loadings at the Facility. Independent of modifications to the Class A biosolids upgrades, these Phase 1 upgrades would be required to accommodate the increased biosolids loadings.

5.3.1.1 Site Work

At the Facility site, improvements will be needed to accommodate new tankage and restoration of pervious and impervious surfaces due to construction activity. Centrate storage facilities are discussed in Section 5.3.1.5, but will require site piping to convey centrate to and from the tankage, as well as an area lift station to pump centrate into trucks leaving the Facility. The proposed area lift station is 8 feet in diameter, contains two submersible pumps, and includes an external valve vault for accessibility to the process valves. After construction is complete on process tankage and piping, the site restoration scope includes asphalt paving replacement, site grading improvements, seeding and landscaping.

5.3.1.2 Receiving

The biosolids receiving process garage is proposed to be increased to accommodate and utilize two truck scales for simultaneous offloading. A proposed garage addition to the east would include removal of the existing eastern wall, expansion of the north and south walls, and reconstruction to include space for a total of four 14' wide overhead doors to allow for entrance and exit through two separate bays for biosolids unloading. To support a new drive on scale, in similar fashion to the existing scale, metal supports would be installed beneath the garage inside of the biosolids storage tank. The space would receive new HVAC improvements to adequately handle air discharged from two trucks. The proposed upgrade would encompass approximately 300 square feet of new garage space, for a total garage space of 3,168 square feet for biosolids receiving at the Facility.

5.3.1.3 Screening

With the addition of a second biosolids receiving bay, a second screen is required to accommodate simultaneous offloading. To house a second sludge screen, a new screening room would need to be constructed east of the garage expansion, over the biosolids storage tanks. The approximately 500 square feet screen room would house a new sludge screen with piping and valving to accommodate screened biosolids discharge into either of the four sludge holding tanks below the floor. Screenings removed from the biosolids stream are discharged to a dumpster for disposal. The screening room addition would include all HVAC, electrical, and lighting requirements to meet current code requirements and provide for safe working conditions.

5.3.1.4 Sludge Storage Tanks

Phase 1 loading projections for the Facility, and maximum loading conditions for current loadings, indicate that increased storage capacity is required for received liquid biosolids. It is proposed to convert and utilize the existing centrate storage tankage for received liquid biosolids, thereby utilizing all four existing buried tanks for liquid biosolids storage. Improvements to the tankage include addition of mixing with submersible mixing pumps, piping and valves, as well as modification to the tank floor slopes to direct settled solids to the pump suctions. To improve upon deficiencies with the existing system, modification to the garage floor drain piping would be included in the storage tank upgrades to allow for Facility staff to select which of the four tanks to discharge into. The existing tanks would each receive a buried exhaust air piping connection to the odor control system for biosolids storage to reduce above grade piping and ensure sufficient space exists for building additions previously described in Section 5.3.1.2 and 5.3.1.3.

Additionally, each of the four access hatches would be replaced for staff safety and maintenance improvements.

5.3.1.5 Centrate Storage Tanks

Conversion of the existing centrate storage tankage to biosolids storage requires the construction of new centrate storage facilities. Centrate storage is proposed with two new circular tanks, measuring 36 feet in diameter with 15 feet side water depths, with coned bottoms, to provide approximately 114,000 gallons of centrate storage each. Unlike the current centrate storage tanks, the new tanks would be configured to allow for mixing and subsequent settling in an effort to reduce the amount of solids returned to contributing treatment facilities. The use of the circular storage tanks and conical bottoms allow for solids carried into the centrate to settle and be pumped back to the biosolids storage tanks. Then reduced solids content centrate can be pumped to trucks prior to leaving the Facility. To reduce odor emissions from the tanks, each is proposed to be covered with aluminum covers and piping be provided to a dedicated odor control biofilter system for the centrate storage tanks.

5.3.1.6 Chemical Feed Building

The final improvement included as a part of the baseline Phase 1 improvements is construction of a new chemical feed building, entirely removed from the existing Facility structure. In order to develop code compliant chemical feed facilities and safely store the required process chemicals, a new structure would be built with individual rooms to separate the chemicals from one another. Each chemical feed room would have two tanks and two pumps to ensure adequate storage and redundancy for chemical dosing. All HVAC, plumbing, and electrical components would be designed to operate under potentially corrosive environmental conditions. Site piping between the existing Facility and the new chemical feed building would include water for chemical carrier and emergency showers, and carrier piping to allow tubing be pulled between the structures for dosing back at the biosolids treatment process.

5.3.2 Phase 2 – Upgrades for 2038 Design Loadings

Phase 2 Facility upgrades are those that are not immediately required to address current loadings, but based on Facility loading projections, would be required to provide required capacity to achieve the 20 year design projections. It is anticipated that these improvements would be incorporated into to the Facility somewhere around half way through the planning period.

5.3.2.1 Centrifuge Dewatering Units

As loadings to the Facility increase during the planning period, the centrifuge capacity rating becomes a limiting factor for the process. Based on the 20 year projection for maximum week loadings, centrifugation capacity will need to be increased to 3,178 lbs/hr. Due to the increase in capacity, the footprint of the centrifuge units also increases. These larger centrifuge units would require larger platforms and modifications within the existing space to provide sufficient space for the units and clear space for maintenance. In addition to the larger centrifuge units, a new polymer skid would be added to ensure reliable dosing occurs as a part of the dewatering process. The cake solids conveyor system would also need potential modifications to transport solids depending on the discharge location of the new centrifuges. Upgrades to the centrifuge and polymer spaces included lighting, HVAC, and electrical improvements to meet current codes requirements and improve working conditions for Facility staff.

5.3.2.2 Pumping

In addition to solids loading to the centrifuges, the volume of biosolids to be pumped is projected to increase beyond the current pumping equipment capacity. Proposed biosolids pumping

upgrades from sludge storage to the centrifuges consists of installation of three new positive displacement style pumps, rated for 350 gpm at 50 psi. To accommodate the increased flow requirements and pumping design point, the piping gallery will need to be re-piped from the current 4" piping with larger, 8" diameter piping to limit velocity in the pipes and reduce head loss and wear on the pumps. On the suction side of the new pumps, new suction lines into each of the sludge storage tanks would be constructed, along with new magnetic flow meters to monitor pumping rates and volume conveyed to the centrifuge. While pumping and piping improvements are made in the space, HVAC and electrical work would be completed to update the space to current code requirements and improve working conditions.

5.4 Description of Biosolids Processing Upgrade Alternatives

Separated from the baseline phased capacity related upgrades described previously, the Facility explored three general alternatives for the future of the Class A biosolids processing technology. In particular, the Facility was interested in reducing the volume of Class A biosolids produced and therefore reducing the quantity that is required to be disposed of during fall and spring application windows. The evaluation generally consisted of maintaining the current treatment of lime stabilization, utilizing lime stabilization followed by sludge drying, and removing the lime stabilization entirely to be replaced with sludge drying. Based on the technology, odor control treatment of varying magnitude was also included. Additional consideration for drying alternatives looked at a current operations schedule of 45 hours per week, based on 10 hour days and 4.5 days per week, compared to 96 hours per week, based on 24 hours per day for 4 days.

5.4.1 Alternative A – Lime Stabilization Only

The Alternative A analysis included continued use of the existing lime stabilization process, while continuing to operate under a similar 45 hour per week schedule. Continuous operation of the lime treatment system was not considered due to the significant manpower and oversite requirements needed to operate the equipment. Phased construction and upgrades to accommodate projected loadings are possible and were included in the evaluation. Class A biosolids generated from the process are typically 30 to 35% solids and only removed during typical spring and fall hauling for agricultural land application.

Alternative A is considered as a baseline, but does not solve a number of issues that the Facility continues to deal with on an annual basis. Mentioned in Section 3.1.7, the quantity of biosolids coupled with inability to access agricultural sites and a decreasing number of disposal sites requires a solution at the Facility to reduce volume. Alternative A, while still producing Class A biosolids, does not offer a long-term solution to for reducing volume, reducing odor, or improving safety.

5.4.1.1 Phase 1

5.4.1.1.1 Lime Stabilization Equipment

No specific process upgrades or capacity improvements are required of the existing lime stabilization equipment through Phase 1 of the planning period. Upgrades to the HVAC in the space housing the equipment should be improved to address code compliance issues and improve working conditions.

5.4.1.1.2 Additional Storage Area

No additional storage is required for the biosolids generated from the lime stabilization system through Phase 1. Assuming the Facility is able to empty the storage area each hauling season, 180 days of storage exists based on the annual average projections for Phase 1.

5.4.1.1.3 Odor Control Equipment

To replace the existing chemical scrubber which treats odors generated by the lime stabilization process and the Class A biosolids in storage, two odor control technologies are proposed due to the large volume of air to be treated and to supplement one another during hauling periods. A large biofilter is planned to treat air exhausted from the biosolids storage area during day to day operations throughout the year when ambient air temperature is above freezing. Due to a lack of biofilter effectiveness in winter, a photoionization unit is proposed to treat storage area air during winter months. It is anticipated that for spring and fall hauling when the odors from the Facility are the greatest due to disturbance of stored cake biosolids, that both the biofilter and photoionization unit would be in operation. The proposed biofilter includes 9,000 square feet of surface area based on an empty bed residence time of 1.5 minutes and an air flow rate to achieve 3 air changes per hour in the space, as recommended by the Manufacturer. The photoionization technology is sized at half the capacity of the biofilter due to the reduction of odor during winter months. The chemical scrubber was not considered to be reused in any of the alternatives due to safety concerns for Facility staff with sulfuric acid handling and storage on site.

5.4.1.2 Phase 2

5.4.1.2.1 Lime Stabilization Equipment

With the increased loading projections in Phase 2, the existing lime stabilization process requires improvements be made to increase the output of the Schwing-Bioset pump. Per the Manufacturer, by replacing the existing 40 HP power unit with a 60 HP power unit, the capacity of the process is increased to 52 gpm allowing for increased production on maximum week and maximum day projected loadings. In addition, electrical improvements are required with the increased motor size. Additional modifications to the lime stabilization equipment, including the lime feed system, reactor, or augers, would not be required.

5.4.1.2.2 Additional Storage Area

Based on projected annual average loadings for the design year of 2038, the Facility would produce more Class A biosolids than the existing structure can accommodate, and does not meet the 180 day storage requirement. To provide additional storage capacity for the Class A lime stabilized biosolids, a new 3,000 square feet storage structure is proposed to be constructed to the south of the existing storage area. The proposed structure would include a paved floor for ease of moving biosolids as well as a water service extension for cleaning and subsequent drains back to the proposed area lift station. The additional storage area would receive new odor control biofilter, dedicated for the space. Based on the projections, this additional storage would be needed by the end of the planning period and is thus a Phase 2 consideration, however if projections differ from the actual end product needs, additional storage may not be required.

5.4.1.2.3 Odor Control Equipment

Additional odor control equipment is proposed based on the additional storage requirements for lime stabilized Class A biosolids. In the event that additional storage space is required, additional biofiltration and photoionization equipment would be added to treat odors generated from the new

3,000 square feet storage space. The biofilter would again be sized to handle 3 air changes per hour from the space, whereas the photoionization equipment would be rated at 1.5 air changes per hour.

5.4.2 Alternative B1 – Lime Stabilization Followed by Sludge Drying (45 Hours Operated Per Week)

In both Alternative B scenarios, lime stabilization is followed by sludge drying. Because the lime stabilization process meets the requirements of Class A biosolids, sludge drying is used purely as a volume reduction method, by drying to an assumed 60% solids. The Facility selected a 60% dry product based on various samples that were sent to a manufacturer for testing. A 60% solids product sufficiently reduces the end volume of biosolids, would be suitable to for spreading applications on alfalfa fields (final product results in an easily spreadable product), and is wet enough to minimize dust production inside of the Facility. For the purposes of the analysis, belt drying was utilized for equipment sizing and the resulting spaces required. A decision on drying technology was not made by the Facility as a part of these planning efforts.

In Alternative B1 biosolids are processed utilizing the existing lime stabilization process and followed by sludge drying to increase the solids content and thereby decrease the end product volume. In Alternative B1, it is assumed that sludge drying will follow the current operations schedule of 10 hour days, 4.5 days per week, for a total of 45 hours.

5.4.2.1 Phase 1

5.4.2.1.1 Lime Stabilization Equipment

No specific process upgrades or capacity improvements are required of the existing lime stabilization equipment through Phase 1 of the planning period. Upgrades to the HVAC in the space housing the equipment should be improved to address code compliance issues and improve working conditions.

5.4.2.1.2 Sludge Drying

The addition of sludge drying equipment is proposed to be contained within a new room inside of the existing sludge storage area at the Facility. For Alternative B1, two 40’ long belt dryers are required to provide sufficient capacity for Phase 1 loading projections. The projected dryer capacity is approximately 72 tons of wet biosolids per day to be dried to 60% solids. With the ancillary equipment and maintenance space requirements, the enclosed space would encompass a footprint of approximately 11,000 square feet. The room would be oversized during Phase 1 to accommodate equipment expansion, further described below in Section 5.4.2.2.2. Dried biosolids from the end of the drying equipment would be discharged onto a conveyor system to be transported out into the storage area for stockpiling. Additional piping is required from the discharge of the lime stabilization process to pump biosolids to the inlet of the dryer equipment. The dryer space would also include addition of wash water piping and process drains for the dryer condensate. The natural gas service for the Facility would also need to increase the service diameter and pressure to meet the needs of the dryers. The new space would include HVAC, plumbing, and electrical construction to meet code requirements and create a safe working environment for staff.

5.4.2.1.3 Odor Control Equipment

The odor control approach for this alternative is similar to that of Alternative A, since there will still be a significant production of ammonia and reduced hydrogen compounds due to the lime stabilization process. To replace the existing chemical scrubber which treats odors generated by the lime stabilization process and the Class A biosolids in storage, two odor control technologies are proposed due to the large volume of air to be treated and to supplement one another during hauling periods. A large biofilter is planned to treat air exhausted from the biosolids storage area during day to day operations throughout the year when ambient air temperature is above freezing. Due to a lack of biofilter effectiveness in winter, a photoionization unit is proposed to treat storage area air during winter months. It is anticipated that for spring and fall hauling when the odors from the Facility are the greatest, that both the biofilter and photoionization unit would be in operation. The proposed biofilter includes approximately 7,500 square feet of surface area based on an empty bed residence time of 1.5 minutes and an air flow rate to achieve 3 air changes per hour in the space, as recommended by the Manufacturer. The photoionization technology is sized at half the capacity of the biofilter due to the reduction of odor during winter months.

5.4.2.2 Phase 2

5.4.2.2.1 Lime Stabilization Equipment

With the increased loading projections in Phase 2, the existing lime stabilization process requires improvements be made to increase the output of the Schwing-Bioset pump. Per the Manufacturer, by replacing the existing 40 HP power unit with a 60 HP power unit, the capacity of the process is increased to 52 gpm allowing for increased production on maximum week and maximum day projected loadings. In addition, electrical improvements are required with the increased motor size.

5.4.2.2.2 Sludge Drying

Based on the Phase 2 loading projections, additional dryer capacity will be required to process increasing loadings through the design period. Dryer expansion from Phase 1 requires the addition of 20 feet of belt dryer to each of the two existing units, resulting in a total of two 60 feet long dryers. The drying technology considered for this Facilities Plan is constructed in a modular fashion that will accommodate expansion of the system in the future. If an alternative technology is considered Phase 2 loadings will need to be incorporated into the preliminary equipment sizing. With the extension of the dryers, modifications to the conveyor installed during Phase 1 will also be needed. This includes disassembly and relocation of the conveyor while the dryer footprint is expanded and subsequent reinstallation of the conveyor to capture dried solids from the new discharge point of the dryer.

5.4.2.2.3 Odor Control Equipment

With no additional spaces being added as a part of Phase 2, Alternative B1 does not require expansion of or modification to the odor control equipment installed during Phase 1.

5.4.3 Alternative B2 – Lime Stabilization Followed by Sludge Drying (96 Hours Operated Per Week)

In Alternative B2 biosolids are processed utilizing the existing lime stabilization process and followed by sludge drying to increase the solids content and thereby decrease the end product volume. In Alternative B2, it is assumed that sludge drying will occur for 24 hours per day, for 4

days each week, for a total of 96 hours. The rest of the Facility process follows the current operations schedule of 10 hour days, 4.5 days per week, for a total of 45 hours per week. To achieve this, hoppers will be required in front of the drying equipment to equalize the 10 hours of lime treated biosolids over the 24 hour dryer operating period.

5.4.3.1 Phase 1

5.4.3.1.1 Lime Stabilization Equipment

No specific process upgrades or capacity improvements are required of the existing lime stabilization equipment through Phase 1 of the planning period. Upgrades to the HVAC in the space housing the equipment should be improved to address code compliance issues and improve working conditions.

5.4.3.1.2 Sludge Drying

The addition of sludge drying equipment is proposed to be contained within a new room inside of the existing sludge storage area at the Facility. For this Alternative B2, one 50' long belt dryer is required to handle the full design life loading projections. The projected dryer capacity is approximately 88 tons of wet biosolids per day to be dried to 60% solids. With the ancillary equipment and maintenance space requirements, the enclosed space would encompass a footprint of approximately 6,000 square feet. Dried biosolids from the end of the drying equipment would be discharged onto a conveyor system to be transported out into the storage area for stockpiling. Additional piping is required from the discharge of the lime stabilization process to pump biosolids to a biosolids hopper which augers cake solids to the dryer inlet. The hopper is utilized as an equalization vessel so that the drying equipment can continue in operation during periods when the receiving and dewatering processes are shut down following a daily shift. The dryer space would also include addition of wash water piping and process drains for the dryer condensate. The natural gas service for the Facility would also need to increase the service diameter and pressure to meet the needs of the dryers. The new space would include HVAC, plumbing, and electrical construction to meet code requirements and create a safe working environment for staff.

5.4.3.1.3 Odor Control Equipment

The odor control approach for this alternative is similar to that of Alternative A, since there will still be a significant production of ammonia and reduced hydrogen compounds due to the lime stabilization process. To replace the existing chemical scrubber which treats odors generated by the lime stabilization process and the Class A biosolids in storage, two odor control technologies are proposed due to the large volume of air to be treated and to supplement one another during hauling periods. A large biofilter is planned to treat air exhausted from the biosolids storage area during day to day operations throughout the year when ambient air temperature is above freezing. Due to a lack of biofilter effectiveness in winter, a photoionization unit is proposed to treat storage area air during winter months. It is anticipated that for spring and fall hauling when the odors from the Facility are the greatest, that both the biofilter and photoionization unit would be in operation. The proposed biofilter includes approximately 8,500 square feet of surface area based on an empty bed residence time of 1.5 minutes and an air flow rate to achieve 3 air changes per hour in the space, as recommended by the Manufacturer. The photoionization technology is sized at half the capacity of the biofilter due to the reduction of odor during winter months.

5.4.3.2 Phase 2

5.4.3.2.1 Lime Stabilization Equipment

With the increased loading projections in Phase 2, the existing lime stabilization process requires improvements be made to increase the output of the Schwing-Bioset pump. Per the Manufacturer, by replacing the existing 40 HP power unit with a 60 HP power unit, the capacity of the process is increased to 52 gpm allowing for increased production on maximum week and maximum day projected loadings. In addition, electrical improvements are required with the increased motor size.

5.4.3.2.2 Sludge Drying

For Alternative B2, a phased construction approach for sludge drying was not considered since only one dryer is required to process the projections through Phase 2. If desired by the Facility, a smaller dryer could be installed initially with Phase 2 expansion occurring similar to what was presented for Alternative B1 in Section 5.4.2.2.2.

5.4.3.2.3 Odor Control Equipment

With no additional spaces being added as a part of Phase 2, Alternative B2 does not require Phase 2 improvements for odor control equipment installed during Phase 1.

5.4.4 Alternative C1 – Sludge Drying Only (45 Hours Operated Per Week)

In both Alternative C scenarios, the lime stabilization process is removed from the Facility. To maintain production of a Class A biosolids product and reduce the volume of the end product, biosolids are dried to 90% solids. The 90% product is assumed to be stored in one of two ways, to be decided by the Facility. Solids can be stored in silos to reduce dust and allow for drive under space to top fill trucks or be stored in bulk bags from a screw conveyor. For the purposes of the analysis, belt drying utilizing the same technology as Alternatives B1 and B2 was utilized for equipment sizing and the resulting spaces required. A decision on drying technology was not made by the Facility as a part of these planning efforts.

In Alternative C1 biosolids are processed entirely via sludge drying to produce Class A biosolids and increase the solids content and thereby decrease the end product volume. In Alternative C1, it is assumed that sludge drying will follow the current operations schedule of 10 hour days, 4.5 days per week, for a total of 45 hours.

5.4.4.1 Phase 1

5.4.4.1.1 Lime Stabilization Equipment

By drying biosolids to 90% solids to achieve Class A, the existing Bioset lime stabilization process is not required and would be removed from the Facility. To convey cake solids to the new drying equipment however, it is proposed to utilize the existing Bioset pump and extend piping to the sludge drying equipment.

5.4.4.1.2 Sludge Drying

The addition of sludge drying equipment is proposed to be contained within a new structure inside of the existing sludge storage area at the Facility. For this Alternative C1, two 50’ long belt dryers

are required at Phase 1 loading projections. The projected dryer capacity at Phase 1 is approximately 58 tons of wet biosolids per day to be dried to 90% solids. With the ancillary equipment and maintenance space requirements, the enclosed space would encompass a footprint of approximately 11,000 square feet. The room would be oversized during Phase 1 to accommodate equipment expansion, further described below in Section 5.4.4.2.2. Dried biosolids from the end of the drying equipment could be stored using silos or an automated bulk bagging system. Solids discharged from the dryer fall onto a conveyor system to be transported to exterior storage silos or a smaller equalization silo for the bagging system. At Phase 1 loadings, approximately 4,000 cubic yards of biosolids would be produced per year. Two storage silos for the 90% dried biosolids would eliminate dust concerns inside of the Facility and provide for the ability to drive hauling trucks under the silos. A nitrogen purge system would be included with the silo controls, used to reduce explosion potential with the dried product. If bagging is utilized, a small silo would be used as a storage vessel such that a four cell bagging system could be operated during normal working hours. Bags would be filled until the weight is such that a bag need to be removed and replaced. The additional piping from the Bioset pump, described in Section 5.4.4.1.1 would deliver biosolids to the inlet of the dryer equipment. The dryer space would also include addition of wash water piping and process drains for the dryer condensate. The natural gas utility for the Facility would also need to increase the service diameter and pressure to meet the needs of the dryers. The new space would include HVAC, plumbing, and electrical construction to meet code requirements and create a safe working environment for staff.

5.4.4.1.3 Odor Control Equipment

To replace the existing chemical scrubber which treats odors generated by the lime stabilization process and the Class A biosolids in storage, a single biofilter is proposed to treat process air discharged exclusively from the sludge drying equipment. The proposed biofilter includes approximately 600 square feet of surface area based on an empty bed residence time of 1.5 minutes and the 3,000 cfm exhaust air contributions from the sludge drying equipment. Because of the temperatures of the air discharged from the dryer, it is anticipated that a biofilter could maintain functional biology and treatment year-round. By eliminating biosolids storage from inside of the existing storage area, no additional odor control is required for the space.

5.4.4.2 Phase 2

5.4.4.2.1 Lime Stabilization Equipment

No additional work is required as a part of Phase 2, after being removed from service as a part of Alternative C1.

5.4.4.2.2 Sludge Drying

Based on the Phase 2 loading projections, additional dryer capacity will be required to process increasing loadings through the design period. Dryer expansion from Phase 1 requires the addition of 10 feet of belt dryer to each of the two existing units, resulting in a total of two 60 feet long dryers. The drying technology considered for this Facilities Plan is constructed in a modular fashion that will accommodate expansion of the system in the future. If an alternative technology is considered Phase 2 loadings will need to be incorporated into the preliminary equipment sizing. With the extension of the dryers, modifications to the conveyor installed during Phase 1 will also be needed. This includes disassembly and relocation of the conveyor while the dryer footprint is expanded and subsequent reinstallation of the conveyor to capture dried solids from the new discharge point of the dryer.

5.4.4.2.3 Odor Control Equipment

With no additional spaces being added as a part of Phase 2, Alternative C1 does not require Phase 2 improvements for odor control equipment installed during Phase 1.

5.4.5 Alternative C2 – Sludge Drying Only (96 Hours Operated Per Week)

In Alternative C2 biosolids are processed entirely via sludge drying to produce Class A biosolids and increase the solids content and thereby decrease the end product volume. In Alternative C2, it is assumed that sludge drying will occur for 24 hours per day, for 4 days each week, for a total of 96 hours. The rest of the Facility process follows the current operations schedule of 10 hour days, 4.5 days per week, for a total of 45 hours. To achieve this, hoppers will be required in front of the drying equipment to equalize the 10 hours of lime treated biosolids over the 24 hour dryer operating period.

5.4.5.1 Phase 1

5.4.5.1.1 Lime Stabilization Equipment

By drying biosolids to 90% solids to achieve Class A, the existing Bioset lime stabilization process is not required and would be removed from the Facility. To convey cake solids to the new drying equipment however, it is proposed to utilize the existing Bioset pump and extend piping to the sludge drying equipment.

5.4.5.1.2 Sludge Drying

The addition of sludge drying equipment is proposed to be contained within a new structure inside of the existing sludge storage area at the Facility. For this Alternative C2, two 40’ long belt dryers are required to handle the full design life loading projections. The projected dryer capacity at is approximately 79 tons of wet biosolids per day to be dried to 90% solids. With the ancillary equipment and maintenance space requirements, the enclosed space would encompass a footprint of approximately 9,500 square feet. Dried biosolids from the end of the drying equipment would be discharged onto a conveyor system to be transported to exterior storage silos or a smaller equalization silo for the bulk bagging system. At design loadings, approximately 5,000 cubic yards of biosolids would be produced per year. Two storage silos for the 90% dried biosolids would eliminate dust concerns inside of the Facility and provide for the ability to drive hauling trucks under the silos. A nitrogen purge system would be included with the silo controls, used to reduce explosion potential with the dried product. If bagging is utilized, a small silo would be used as a storage vessel such that a four cell bagging system could be operated during normal working hours. The additional piping from the Bioset pump, described in Section 5.4.5.1.1 would deliver biosolids to the inlet of the dryer equipment. The dryer space would also include addition of wash water piping and process drains for the dryer condensate. The natural gas utility for the Facility would also need to increase the service diameter and pressure to meet the needs of the dryers. The new space would include HVAC, plumbing, and electrical construction to meet code requirements and create a safe working environment for staff.

5.4.5.1.3 Odor Control Equipment

To replace the existing chemical scrubber which treats odors generated by the lime stabilization process and the Class A biosolids in storage, a single biofilter is proposed to treat process air discharged exclusively from the sludge drying equipment. The proposed biofilter includes

approximately 400 square feet of surface area based on an empty bed residence time of 1.5 minutes and the 2,000 cfm exhaust air contributions from the sludge drying equipment. Because of the temperatures of the air discharged from the dryer, it is anticipated that a biofilter could maintain functional biology and treatment year-round. By eliminating biosolids storage from inside of the existing storage area, no additional odor control is required for the space.

5.4.5.2 Phase 2

5.4.5.2.1 Lime Stabilization Equipment

No additional work is required as a part of Phase 2, after being removed from service as a part of Alternative C2.

5.4.5.2.2 Sludge Drying

For Alternative C2, a phased construction approach for sludge drying was not considered since two small dryers are required to process the projections through Phase 2 and provide adequate redundancy. If desired by the Facility, a smaller dryer could be installed initially with Phase 2 expansion occurring similar to what was presented for Alternative C1 in Section 5.4.4.2.2.

5.4.5.2.3 Odor Control Equipment

With no additional spaces being added as a part of Phase 2, Alternative C2 does not require Phase 2 improvements for odor control equipment installed during Phase 1.

6. ALTERNATIVES COMPARISON

6.1 General

This chapter presents an analysis of financial and other factors for the alternatives described in Chapter 5. The financial analyses includes capital, operation and maintenance, replacement and present worth cost evaluations for each alternative. Operation and maintenance costs are based on the current budget for the Facility with changes made as appropriate to account for each proposed alternative. Additions and savings to the budget are allocated as appropriate to account for changes in energy requirements, materials, and staffing associated with the process changes described. The present worth cost analysis is intended to provide an evaluation of the cost-effectiveness of the alternatives, and is used in conjunction with consideration of other factors to select a recommended alternative. The other factors analysis includes potentially impacting costs and non-economic factors such as ease of operation, future growth potential, environmental impacts, and other considerations.

6.2 Capital Costs

This section presents capital costs for phased upgrades that would be constructed to meet current capacity needs and for the projected loadings summarized in Chapter 4, as well as capital costs for the various biosolids processing alternatives presented in Chapter 5. Summarized capital costs for each of the phased upgrades, independent of the biosolids processing alternatives, are presented below in Table 6-1. These costs include the changes that need to be made to the Facility in order to continue to process biosolids through the projected loadings in 2028 and 2038. For Phase 1 upgrades, this generally includes biosolids receiving and storage, and centrate storage, as described in Section 5.3.1. For Phase 2 upgrades, this generally includes biosolids pumping and dewatering, as described in Section 5.3.2. A more detailed cost breakout for the Facility phased upgrades is provided in Appendix F. The process models that were used to develop the sizes for structures and equipment are provided in Appendix G.

The capital costs listed in Table 6-1 include costs for the eventual general contractor's scope of services; a contingency of 10% of the projected contractor's cost; and engineering, administration and legal work that will be necessary to plan, design, finance and manage the project. The contractor's scope of services includes construction of the facility modifications with a cost being included for the contractor's mark up to accommodate overhead and profit, and contract administration. It must be kept in mind that construction and operations costs could change between the date of this facility planning document and the time when the eventual project is bid out.

Table 6-1 Phased Upgrades – General Facility Upgrades Capital Cost Summary

Phase	Construction	Contingency, Engineering, Administration, & Legal	Total
1	$4,060,393	$1,096,306	$5,156,699
2	$2,591,040	$699,581	$3,290,621

The phased upgrades are baseline improvements required at the Facility to continue to process biosolids in a similar fashion to current operations, but to ensure capacity exists to meet the demands of the future projections from Chapter 4. Beyond the scope of the baseline phased upgrades at the Facility, capital costs were developed for each biosolids processing alternative, summarized in Chapter 5. The summarized capital costs for each alternative, broken down by what could occur during Phase 1 and Phase 2, are presented below in Table 6-2. These costs

are then combined with the costs of the Phases themselves from Table 6-1 in Table 6-3 to come up with a total cost for each project alternative that could be chosen. The capital costs listed in Table 6-2 also include costs for the eventual general contractor's scope of services; a contingency of 10% of the projected contractor's cost; and engineering, administration and legal work that will be necessary to plan, design, finance and manage the project.

Table 6-2 Biosolids Processing Alternatives – Capital Cost Summary

Alternative	Construction	Contingency, Engineering, Administration, & Legal	Total
Phase 1			
A – Lime Only	$2,049,606	$553,394	$2,603,000
B1 – Lime and Drying, 45 hours	$11,118,008	$3,001,862	$14,119,871
B2 – Lime and Drying, 96 hours	$8,210,611	$2,216,865	$10,427,476
Silo Storage			
C1 – Drying Only, 45 hours	$10,969,702	$3,071,517	$14,041,218
C2 – Drying Only, 96 hours	$10,512,509	$2,943,503	$13,456,012
Bulk Bagging Storage			
C1 – Drying Only, 45 hours	$9,294,236	$2,602,386	$11,896,622
C2 – Drying Only, 96 hours	$8,837,043	$2,474,372	$11,311,416
Phase 2			
A – Lime Only	$869,959	$234,889	$1,104,848
B1 – Lime and Drying, 45 hours	$822,483	$222,071	$1,044,554
B2 – Lime and Drying, 96 hours	$224,453	$60,602	$285,055
Silo Storage			
C1 – Drying Only, 45 hours	$1,445,885	$404,848	$1,850,733
C2 – Drying Only, 96 hours	-	-	-
Bulk Bagging Storage			
C1 – Drying Only, 45 hours	$1,445,885	$404,848	$1,850,733
C2 – Drying Only, 96 hours	-	-	-

Table 6-3 Combined Project Costs - Capital Cost Summary

Alternative	Phase 1	Phase 2	Total
A – Lime Only	$7,759,699	$4,395,469	$12,155,168
B1 – Lime and Drying, 45 hours	$19,276,569	$3,433,684	$22,710,253
B2 – Lime and Drying, 96 hours	$15,584,175	$2,674,185	$18,258,360
Silo Storage			
C1 – Drying Only, 45 hours	$19,197,917	$4,239,862	$23,437,779
C2 – Drying Only, 96 hours	$18,612,711	$2,389,130	$21,001,840
Bulk Bagging Storage			
C1 – Drying Only, 45 hours	$17,053,320	$4,239,862	$21,293,183
C2 – Drying Only, 96 hours	$16,468,114	$2,389,130	$18,857,244

The low capital cost alternative, Alternative A – Lime Only, is 48%, or $11,282,611, less than the highest cost alternative, Alternative C1 – Drying Only, 45 hours, with Silo Storage. The difference in cost between the alternatives is tied to the biosolids processing upgrades, by installing new drying equipment and Class A biosolids storage compared to utilizing the existing lime stabilization system, with upgrades.

6.3 Operation and Maintenance Costs

Annual O&M costs for each of the alternatives are summarized below in Table 6-4. The table includes costs for start-up conditions which are to be expected when the upgraded facility goes into operation following construction, and the Phase 1 and Phase 2 total expenditures. Annual costs not anticipated to be impacted by improvements or upgrades were assumed to increase at 2% per year to match the increased loadings projections trend for the design period. The total expenditures include operational expenses, maintenance costs, administrative costs, transportation costs, and subsidiary expenses. For calendar year 2020, the Facility had an annual budget of $2,469,823.

Table 6-4 Annual O&M Cost Summary

Alternative	Startup	Phase 1	Phase 2
A – Lime Only	$2,379,323	$2,751,469	$3,247,189
B1 – Lime and Drying, 45 hours	$2,663,210	$3,221,751	$3,735,025
B2 – Lime and Drying, 96 hours	$2,664,513	$3,171,365	$3,698,750
Silo Storage			
C1 – Drying Only, 45 hours	$2,378,307	$2,837,229	$3,312,747
C2 – Drying Only, 96 hours	$2,417,525	$2,885,830	$3,371,997
Bulk Bagging Storage			
C1 – Drying Only, 45 hours	$2,525,057	$3,001,797	$3,499,024
C2 – Drying Only, 96 hours	$2,564,276	$3,050,398	$3,558,275

A detailed breakout of the O&M costs for each of the alternatives is given in the appropriate section of Appendix F, along with other supporting information. The detailed breakout uses the Facility's budgeted line item format as a template for listing these variations in cost.

In Alternative A, annual O&M costs generally consist of similar costs to current Facility operations. Additional maintenance costs were included for new tankage and structures, specifically for new centrate storage, biosolids storage, and new chemical feed.

For the Alternative B options, annual O&M costs increase due to the additional of equipment and structures, but also includes decreases related to distribution of the final Class A biosolids product. Large operational cost increases include electricity and natural gas for sludge drying equipment and costs associated with an additional one-half staff member to ensure sufficient staff exists to cover the additional processes added. Maintenance cost increases relate to new tankage and structures, similar to Alternative A, but also includes costs associated with maintaining the new sludge drying equipment. Subsidiary expenses, specifically 'Product Marking and Distribution' as listed in the Facility's budget, decreases under Alternative B because of the reduction in volume as a result of sludge drying.

For the Alternative C options, with the removal of the lime stabilization process, a number of changes to the annual budget occur. For operational expenses, increases are again anticipated due to an increase in electrical and natural gas costs for the sludge drying equipment and the addition of one-half staff member. Decreases in the operational costs are associated with removing expenses for lime and sulfamic acid, neither of which are required with the removal of the Bioset process. Maintenance cost increases related to new tankage and structures, similar to previous alternatives, but also includes costs associated with maintaining the new sludge drying equipment and the storage silos or bulk bagging system, depending on the option pursued. Subsidiary expenses decrease the most in Alternative C due to the large final product volume reduction associated with drying to 90% solids.

6.4 Replacement Costs

Annual replacement costs are summarized for each alternative in Table 6-5. These costs have been separated into the two phases as equipment is added to the Facility, as proposed in Chapter 5. The process costs include the new and replaced equipment for sludge unloading, sludge storage and pumping, centrate storage, chemical feed, centrifuges, sludge processing equipment, and odor control equipment.

Individual replacement costs are calculated by considering the present day installed cost of the equipment and determining the annual contribution necessary to replace the item after an assumed equipment life. The annual cost is calculated assuming an interest rate of 4.5%. Projected inflation values have not been factored into the equipment costs which would increase the higher replacement costs at a greater net amount than the lower replacement costs. Detailed spreadsheets showing the replacement cost values for each of the equipment items for each alternative are presented along with the other cost information in Appendix F of this report.

Table 6-5 Annual Replacement Cost Summary

Alternative	Phase 1	Phase 2 Additions	Total
A – Lime Only	$91,284	$25,204	$116,488
B1 – Lime and Drying, 45 hours	$216,167	$25,204	$241,371
B2 – Lime and Drying, 96 hours	$181,442	$25,204	$206,646
Silo Storage			
C1 – Drying Only, 45 hours	$209,730	$25,204	$234,934
C2 – Drying Only, 96 hours	$205,414	$25,204	$230,618
Bulk Bagging Storage			
C1 – Drying Only, 45 hours	$200,460	$25,204	$225,664
C2 – Drying Only, 96 hours	$196,144	$25,204	$221,347

The replacement costs for Phase 1 show the proposed annual costs for the first ten years of the design period and Phase 2 Additions shows the proposed annual cost added with upgrades classified as Phase 2 in Section 5.3.2. To ensure availability of funds associated with Phase 2 biosolids processing upgrades, the analysis assumes that the full equipment buildout cost is used for Phase 1 replacement fund calculations. Thus, the Phase 2 Additions column only accounts for baseline upgrades and does not include equipment expansions for the biosolids processing alternatives.

6.5 Present Worth Analysis

A present-worth analysis is performed for each alternative by taking the capital cost and adding to it the present worth value of the average annual O&M costs and the annual replacement fund cost calculated over the evaluation period of twenty years. The capital, O&M, and replacement fund are as outlined in the previous paragraphs of this chapter. Salvage costs are assumed to be the same for all alternatives and have not been included in the present worth calculations. The discount rate used for this analysis is 3.625%, which was the WDNR's published rate for Federal Fiscal Year 2019 facility plans that was current when this Facilities Planning Document was started. A summary of the present-worth values is presented below in Table 6-6.

Table 6-6 Present Worth Values of Alternatives

Alternative	Total Capital Costs	Year 1 O&M	Year 1 Replacement Fund	20 Year Present Worth
A – Lime Only	$12,155,168	$2,379,323	$91,284	$52,367,678
B1 – Lime and Drying, 45 hours	$22,710,253	$2,663,210	$216,167	$71,058,195
B2 – Lime and Drying, 96 hours	$18,258,360	$2,664,513	$181,442	$65,854,947
Silo Storage				
C1 – Drying Only, 45 hours	$23,437,779	$2,378,307	$209,730	$66,207,806
C2 – Drying Only, 96 hours	$21,001,840	$2,417,525	$205,414	$64,914,687
Bulk Bagging Storage				
C1 – Drying Only, 45 hours	$21,293,183	$2,525,057	$200,460	$66,311,261
C2 – Drying Only, 96 hours	$18,857,244	$2,564,276	$196,144	$65,018,141

The present-worth values range from approximately $52.3 million for Alternative A up to approximately $71 million for Alternative B1.

6.6 Other Factors

As stated previously, there are several other factors beyond the capital and present worth costs that need to be taken into consideration in the selection of a recommended alternative, and selection of sub-options within that alternative. The other factors analysis includes potentially impacting costs and non-economic factors such as ease of operation, future growth potential, environmental impacts, and other considerations. Each alternative's factors are discussed first, followed by a comparison between the alternatives.

The following factors are discussed for each of the options, where appropriate:

- Utilization of existing structures
- Potential construction issues
- Future facility expansion capability, related to the ability to add structures and technology for future upgrades
- Operational concerns including flexibility, ease of operation and safety for Facility staff
- Energy efficiency
- Biosolids production, storage and distribution
- Noise, air quality, and other environmental factors

6.6.1 Alternative A Factors

Alternative A proposes to continue utilization of the Bioset process to generate Class A biosolids. Since the process is not changing, just increasing capacity, this alternative most efficiently utilizes space within the existing structure. However, at Phase 2 it is proposed to add an additional storage structure to handle the increasing volume of biosolids. The additional structure creates a need for additional asphalt, site grading and site piping in order to mesh the two structures together at the Facility. The additional structure on the site would be required because of the full utilization of the existing structure.

There are few potential construction issues with the proposed upgrades for Alternative A. In Phase 2, a new power unit on the Bioset equipment would require biosolids processing be stopped until the upgrade can occur. The Phase 2 additional storage structure could be constructed without impacting the process, but would require underground site piping and additional site work to ensure proper drainage from the site. By maintaining the current use of the existing storage area and adding additional storage space, the potential for future capacity expansion or new technologies would have sufficient space to grow into.

With continued use of lime stabilization, the Facility staff does not need to be trained on new equipment or processes. The equipment would stay the same and allow for staff to continue operating and maintaining equipment they are familiar with. The alternative does not increase process flexibility, as the system relies on one piece of equipment to continue operations. The safety concerns for Facility staff associated with operations of Alternative A are large due to air quality. This includes the odors generated by the process, during end product storage, and during biosolids hauling. Dust is also a large concern and comes from a number of areas including the lime feed portion of the process, relocation of biosolids from the discharge bunker to the storage area, and during biosolids hauling. There are safety concerns associated with the continued use of sulfamic acid as a part of the lime stabilization process as well.

In terms of energy efficiency and usage, Alternative A continues to rely on electricity to power the process. Electrical consumption at the Facility would increase with the proposed Phase 2 capacity upgrades of the Bioset process, by increasing the power unit motor HP from 40 to 60. Gasoline consumption would also increase in this alternative due to the volume of biosolids produced that would be required to be moved either within the existing storage area or to the new storage area as a part of Phase 2.

The biosolids volume that the Facility must manage is the highest in Alternative A due to the addition of lime and relatively low solids content produced by the process, when compared to the other alternatives. In maintain the lime stabilization process, one of the goals of the Facility planning efforts to reduce end product volume is not met. To continue storing the product as the Facility does now, end loaders move biosolids from the discharge bunker to the back of the storage space and work the pile into the space as the year progresses. With Phase 2 expansion, the end loaders would have to move the product to a new structure to accommodate the growth and increased volume. The Class A product, typically between 30-35% solids, is lumpy and creates issues with agricultural applications outside of typical empty field periods in spring and fall. The volume and consistency of the solids, coupled with increasingly difficult to find or access land spreading sites, creates mounting issues associated with the distribution of the lime stabilized product.

Environmental conditions associated with Alternative A have impacts on noise, dust, and odors at the Facility. Although the Bioset process itself is not overly noisy, lime must be added

continuously to the process. As lime is utilized, the lime in the silos must continue to flow downward to the conveyor. To ensure bridging or damming in the silos does not occur, they are equipped with vibration equipment which creates loud noises outside of the Facility walls. Because of the lime addition, dust is generated and creates undesirable working conditions in the space and increases maintenance efforts to keep the space and equipment clean. Odors from the lime stabilization system are strong, such that significant odor control equipment is required to adequately treat odorous compounds before discharging to the atmosphere and the surrounding community.

6.6.2 Alternative B Factors

In Alternative B, lime stabilization is used to produce Class A biosolids, and sludge drying follows as an effort to reduce the volume of solids. The continued utilization of the Bioset process occurs in the same space and efficiently works with the existing structure. To accommodate the new sludge drying equipment, a new space would be required. It is proposed that a new sludge drying room would be constructed within the existing footprint of the Facility, by utilizing space in the existing storage area. This alternative requires new construction for the additional equipment, but does so without expanding the Facility footprint.

Potential for construction issues associated with this alternative primarily includes the complexity of constructing a new, code and energy compliant, space within the existing storage area. Because the storage area is untempered space, the new drying room would require frost wall construction thereby requiring excavation inside of the covered storage space. Constructability of the alternative could allow for continued biosolids processing with the lime stabilization unit until a time when the sludge drying equipment is operational and lime solids can be directed to the dryer for further treatment. By using portions of the existing storage space to create new sludge drying space, additional capacity inside of the existing Facility footprint exists in the event that additional capacity or equipment is required.

The addition of sludge drying equipment at the Facility will require staff to become acclimated to new equipment in order to continue processing biosolids. Operational flexibility is of benefit with the lime stabilization and subsequent drying process due to the redundancy in equipment. In the event that drying equipment is out of service, the Facility can continue to process biosolids and produce a Class A product with the lime stabilization system. Conversely, if the lime stabilization process is out of service, biosolids can still be dried, although not to a Class A standard. The evaluation of the sub-alternatives (B1 and B2) included operating the drying equipment on a typical operation schedule or on a 24 hour per day schedule. To reduce capital costs, equipment sizes, and efficiently operate the process, drying on a 24 hour per day schedule is advantageous and recommended by manufacturers. Implementing this schedule would require additional staff considerations to ensure the equipment performs as intended at all hours of operation. Operator safety concerns with sulfamic acid associated with the lime stabilization process still exist, and the new drying equipment does add different safety concerns including operation of machinery and continued air quality concerns. This includes the odors generated by the process, during end product storage, and during biosolids hauling. Dust is also a large concern and comes from a number of areas including the lime feed portion of the process, relocation of biosolids from the dryer discharge point to the storage area, and during biosolids hauling.

With the addition of sludge drying equipment behind the lime stabilization process, additional electrical loads are added to the Facility and a new high demand for natural gas. Of the alternatives, Alternative B consumes the most energy (electrical and natural gas combined) to process biosolids at the Facility. Energy efficiency is improved for this alternative using Alternative

B2 and operating the drying equipment continuously. With the addition of sludge drying space, heating and cooling of previously untempered space is also required.

Biosolids produced with the proposed Alternative B arrangement would result in an approximately 60% solids product. Based on samples sent to manufacturers by the Facility, 60% was determined to be an optimal concentration for following the lime stabilization process. The increase in solids creates a product that reduces volume from current operations, generates less dust than higher solids applications, and can be effectively applied to crops such as alfalfa between the typical spring and fall hauling windows. Between hauling periods, the staff could continue to transport and pile the product within the existing storage space with an end loader.

Alternative B maintains the environmental factors from Alternative A, while also introducing new items associated with sludge drying equipment and a drier end product. With lime addition, the alternative still has noise components associated with the equipment and silo activators, dust generation, and odors to treat. By adding sludge drying equipment, additional noise pollution will be created as the additional equipment, fans, and motors are required to run to process biosolids. As a byproduct of the drying equipment, additional wastewater is generated which must be hauled offsite for treatment, increasing emissions and gasoline consumption. The 60% solids product creates an increased likelihood for dust creation when the solids are moved about the storage space.

6.6.3 Alternative C Factors

The Alternative C option proposes to remove the lime stabilization as the process in which to produce Class A biosolids and to be replace with sludge drying. The addition of sludge drying, similar to Alternative B, requires the addition of sludge drying space which would be located inside of the existing storage space so as to not increase the overall footprint of the Facility. This alternative requires that pumping equipment remain in the existing lime stabilization room to convey dewatered cake solids to the dryer, but does not repurpose the spaces vacated by the other lime stabilization equipment. Depending on the storage option pursued by the Facility, silos could be added exterior to the existing structure, or automated bagging systems could be installed inside of the existing storage area.

Potential for construction issues associated with this alternative primarily includes the complexity of constructing a new, code and energy compliant, space within the existing storage area. Because the storage area is untampered space, the new drying room would require frost wall construction thereby requiring excavation inside of the covered storage space. If storage silos are utilized, the Facility may need to pursue zoning variances associated with height restrictions inside of the Village of Ellsworth. Constructability of the alternative could allow for continued biosolids processing with the lime stabilization unit until a time when the sludge drying equipment is operational. At that time, the lime system could be decommissioned and removed from service. By using portions of the existing storage space to create new sludge drying space and by removing equipment from the existing lime stabilization room, additional capacity inside of the existing Facility footprint exists in the event that additional capacity or equipment is required.

The addition of sludge drying equipment at the Facility will require staff to become acclimated to new equipment in order to continue processing biosolids. The robustness of the Facility is decreased in this alternative due to the reliance on one process, similar to what is dealt with for current operations. The evaluation of the sub-alternatives (C1 and C2) included operating the drying equipment on a typical operation schedule or on a 24 hour per day schedule. To reduce capital costs, equipment sizes, and efficiently operate the process, drying on a 24 hour per day

schedule is advantageous and recommended by manufacturers. Implementing this schedule would require additional staff considerations to ensure the equipment performs as intended at all hours of operation. Operator safety concerns associated with the new drying equipment include operation of machinery and production of a dry final product that has explosion potential if not handled and tempered properly.

Energy efficiency is slightly increased from Alternative B in that no electrical loads associated with lime stabilization are required. To produce Class A biosolids entirely with drying however, electrical and natural gas loads are required. Energy efficiency is improved for this alternative using Alternative C2 and operating the drying equipment continuously. With the addition of sludge drying space, heating and cooling of previously untempered space is also required.

To achieve Class A biosolids solely using drying technology, an end product of 90% solids is required. This substantially reduces the storage volume requirement at Facility and creates a potentially marketable product that could be utilized by residential and commercial markets, in addition to the ability to continue agricultural land application. The 90% solids product requires the least storage volume and creates far more additional opportunities for the Facility to distribute the Class A product than before.

By adding sludge drying equipment, additional noise pollution will be created as the additional equipment, fans, and motors are required to run to process biosolids. As a byproduct of the drying equipment, additional wastewater is generated which must be hauled offsite for treatment, increasing emissions and gasoline consumption. The 90% solids product creates an increased likelihood for dust issues, thereby requiring additional equipment to minimize and capture dust. Due to the enclosed storage options of silos or bagging, the potential for odorous air is significantly reduced and odor control equipment would be significantly less, designed only to capture exhaust air from the dryer equipment.

6.6.4 Comparison of Factors

Within each alternative, the evaluation of these other factors is critical to the selection of a recommended alternative. Each of the alternatives have specific benefits and drawbacks. Alternative A would minimize impacts to the existing operations and, at least initially, most effectively utilize the existing Facility spaces. Alternative B allows for the most robust biosolids processing alternative due to the redundancy provided from additional drying equipment being added downstream of lime stabilization. Alternative C reduces the final product volume the most of the alternatives and minimizes the odor control equipment required. All alternatives would continue to produce Class A biosolids to accommodate the projected loadings for the next 20 years.

Utilization of existing structures – Alternative A is the only scenario in which the footprint of the Facility is not expanded to continue processing biosolids. Alternatives B and C require new construction within the existing footprint of the Facility.

Potential construction issues – Alternatives B and C propose the addition of sludge drying spaces within the footprint of the existing storage area, requiring excavation and construction within an enclosed space. Alternative A proposes new construction for additional storage capacity.

Future facility expansion capability – All Alternatives create options for additional growth at the Facility. The Alternative A storage expansion would create capacity for growth beyond the 20 year

design projections of the Facility. Alternatives B and C create additional space within the Facility by reducing the volume of biosolids required to be stored in the space.

Operational concerns including flexibility, and ease of operation – In Alternative A, the Facility maintains utilization of equipment known to the staff. Alternative B creates the most robust biosolids processing setup in that two forms of equipment are present on the site, but simultaneously creates additional work in the form of more equipment to maintain on site. Alternative C relies only on sludge drying equipment to produce Class A biosolids and creates an end product that requires specific storage and handling requirements.

Energy efficiency – Each alternative is energy intensive due to the nature of creating Class A biosolids. Alternative A does not include a natural gas component, but instead operates entirely on electrical equipment. Alternative B maintains the electrical components of the lime system and adds natural gas and electrical requirements associated with sludge drying. Alternative C removes lime equipment but still requires electrical and natural gas consumption to dry biosolids.

Biosolids production, storage, and distribution – Alternative A creates the most volume of biosolids, requiring the most storage space, and is the hardest to efficiently remove from the Facility. Alternative B reduces the volume requirements by 50% from Alternative A, and produces a product that can be applied during the summer in addition to spring and fall hauling windows. Alternative C creates the driest product which requires approximately 25% of the storage capacity of Alternative A. The drastic volume reduction and ability to market the end product to additional entities makes this alternative appealing.

Safety – Alternative A creates safety concerns related to air quality due to dust and creation of odorous ammonia and sulfur compounds. Alternative A also requires material handling of lime and sulfamic acid that create significant safety concerns for staff. Alternative B includes similar concerns to Alternative A, with hopes that dust created from the final product will be reduced. Alternative C is anticipated to eliminate air quality and safety concerns with the lime stabilization process, and attempts to address potential safety concerns with the dust through nitrogen filled silo or bag storage.

Noise, air quality, and other environmental factors – By continuing to utilize lime stabilization, Alternative A would expect to be the most similar to the existing operations at the Facility in regards to dusts and odors. Alternative B adds noise to the process and provides little benefit associated with odor reduction. Alternative C, while still contributing noise to the process, drastically decreases the odor control equipment required at the Facility.

6.7 Recommendations

The present worth analysis that was prepared shows that Alternative A, continuing to utilize lime stabilization for producing Class A biosolids, is the lowest cost option for the Facility. However, as explained in Section 6.6, Alternative A has substantial reasons as to why it should not be the selected alternative for the future of the Facility. The difference between the present worth values of the remaining alternatives is less than 10 percent and they are considered essentially equal according to WDNR facility planning guidance.

Because Alternative A does not provide a solution to the Facility's issues, as described with the Other Factors analysis in Section 6.6, it is considered an infeasible alternative for this analysis. In summary, Alternative A:

- Does not reduce the volume of biosolids produced
- Does not improve the ability to reliably remove biosoilds from the Facility
- Does not improve workplace conditions for Facility staff
- Does not reduce odorous impacts to the surrounding community

After removing Alternative A from the evaluation, and based on consideration of present worth costs as well as other factors, Alternative C2 is the recommended alternative for this Facilities Planning Document. By operating the drying equipment for 24 hours periods and drying biosolids to 90%, the Facility accomplishes a primary goal of volume reduction and expands distribution opportunities beyond the limitations associated with agricultural land application. Removing lime stabilization from the process creates a less odorous process and structures, and creates improved working conditions for the Facility's staff.

7. ENVIRONMENTAL IMPACTS

7.1 Project Identification

This chapter provides an analysis of the environmental impacts for the recommended upgrades to the West Central Wisconsin Biosolids Facility, as described in Section 6.7.

7.2 Affected Environment

7.2.1 Land Use

No new land will be required for the proposed upgrades at the existing Facility.

7.2.2 Soils

The soils at the existing Facility site were examined by consulting the United States Department of Agriculture Natural Resources Conservation Service (NRCS) soil maps. The custom NRCS soils report indicates that the soil on the current Facility site is entirely Ella silt loam on slopes ranging from 1% to 6%. Ella silt loam is not considered a hydric soil and it occurs in terraces. Refer to the NRCS report provided in Appendix A.

7.2.3 Important Farmland, Prime Forest Land, and Prime Rangeland

The Farmland Protection Policy Act (FPPA), the USDA regulation implementing the FPPA (7 CFR Part 658), and USDA Departmental Regulation No. 9500-3, “Land Use Policy”, provide protection for important farmland and prime rangeland and forest land. As the proposed modifications to the Facility will take place on the existing site, they will not result in the conversion of prime farmland areas.

The Department of Agriculture, Trade and Consumer Protection (DATCP) must be notified of any project which may involve the acquisition of an interest in land from a farm operation through the use of eminent domain procedures (condemnation). The DATCP should be notified of such a project regardless of whether the proposing agency actually intends to use these powers in the acquisition of rights to proposed project lands. If a proposed project involves the actual or potential exercise of the powers of eminent domain in the acquisition of an interest in more than five acres of land from anyone farm operation, the DATCP is required to prepare an agricultural impact statement (AIS) which describes and analyzes the potential effects of the project on farm operations and agricultural resources. If a proposed project involves five acres or less from any one farm operation, an AIS may be prepared at the DATCP's discretion. According to these guidelines from DATCP, an AIS will not be required for this project since no land will be acquired for the Facility upgrades.

7.2.4 Formerly Classified Lands

There are certain properties that are either administered by Federal, State, or local agencies or have been accorded special protection through formal legislative designations. For the purposes of this report, these properties have been designated “formally classified lands.” Examples include wild and scenic rivers, forestlands, scenic trails, national and state parks, and wildlife refuges. Visual impacts to formally classified land from proposed projects need to be considered as appropriate.

There are no known formally classified lands that will be affected by this project.

7.2.5 Floodplains

The existing Facility structures lie within an area of minimal flood hazard and outside of the 100-year flood plain delineation. A floodplain map is located in Appendix B.

7.2.6 Wetlands

Based on a review of available resources, including the WDNR Surface Water Data Viewer and wetland inventory, there are wetland indicators adjacent to the existing Facility site. Refer to the wetland inventory figure in Appendix B.

If wetlands are determined to be present during the design phase, appropriate permits will be applied for and obtained from the relevant regulating agencies, and strict adherence to the conditions of any permit will be required during construction. Any disturbed wetlands will be restored to pre-existing conditions, and therefore the long-term impacts to any wetlands are expected to be minimal.

7.2.7 Cultural Resources

The National Historic Preservation Act (NHPA) of 1966, as amended, and the Advisory Council on Historic Preservation's (ACHP) implementing regulations, 36 CFR Part 800 (Section 106 regulations), requires Federal agencies to take into account the effect their actions may have on historic properties that are within the proposed project's area of potential effect. To avoid harm to both known historic properties and archeological sites, and to undiscovered sites present in a project area, historic and archaeological sites within or near the project area must be identified, and the effects of the project on these sites must be assessed. A listing of all Wisconsin properties on the National and State Registers of Historic Places contains no entry within the immediate vicinity the West Central Wisconsin Biosolids Facility site.

Since construction will take place only in previously disturbed locations, no impact to historic properties and archeological sites is anticipated.

7.2.8 Biological Resources

Throughout the United States there are many plant and animal species that are threatened with extinction or exist in greatly reduced numbers partly as a result of human activities. The Endangered Species Act (ESA) of 1973 establishes a national program for the conservation and protection of threatened and endangered species of plants and animals and the preservation of habitats upon which they depend. Under Section 7 of the ESA, Federal agencies are required to consult with the United States Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service for all threatened and endangered species. The consultation is to ensure that the proposed project does not jeopardize the continued existence of any federally-listed threatened or endangered species or result in the destruction or adverse modification of a critical habitat.

State agencies should also be contacted for information on State-listed species and concerns. In some instances, the State may have more detailed information on federally-listed or proposed species and/or critical habitat than the USFWS. Other biological resources which may be impacted by the project include fish and wildlife and vegetation.

Pursuant to these requirements, an Endangered Resources Preliminary Assessment was performed for the Facility site using the WDNR Natural Heritage Inventory (NHI) Public Portal. According to this assessment, endangered resources have been recorded for this area and further action would be required or recommended for construction. The Preliminary Assessment is provided in Appendix H.

There are four Federally-listed endangered species potentially affected by activities at the existing Facility site. A review of these species was conducted in accordance with USFWS guidelines and it was concluded that there is no critical habitat in the vicinity of the project and there will be no impact to these species by the proposed project. According to USFWS guidelines, agency concurrence is not required for no effect determinations.

7.2.9 Miscellaneous Impacts

7.2.9.1 Operational Impacts

Operational impacts for the upgraded Facility are expected to be similar to current impacts. During operation the impact to traffic will be minimal, except when disposing of biosolids in the spring and fall, or if additional uses for the biosolids are identified between typical hauling periods. The installation of new drying equipment may increase noise impacts from the existing facility. Section 6.6 addresses other health and environmental impacts related to operation of the plant.

7.2.9.2 Construction Impacts

Modifications to the Facility will have temporary impacts due to construction. These temporary impacts will include the increase of traffic and noise around the construction site and disturbance of dust and dirt during construction. Traffic along routes to the site will increase during construction. Construction impacts will be mitigated as described in Section 7.3.

The proposed modifications to the Facility will not have significant negative impacts on land use in the area.

If high groundwater conditions necessitate the use of high capacity wells (in excess of 70 gpm) for the dewatering, then the environmental impact will be evaluated by the WDNR's Bureau of Water Supply prior to installation of the wells.

7.2.9.3 Secondary Impacts

Upgrades to the Facility may potentially encourage urbanization by making increased biosolids collection and treatment capacity available. By using foresight and careful planning, the contributing communities can encourage only growth that is consistent with local and regional plans.

7.3 Mitigative Measures

Primary impacts regarding operational and agricultural concerns will be minimal and do not require mitigative measures; likewise, secondary impacts regarding urbanization concerns will be minimal as well. Mitigative measures for temporary impacts during construction are described in the following sections.

7.3.1 Construction, Temporary Controls

Temporary impacts during construction will be mitigated. Temporary traffic control barricades, signs, flagmen and detours will be implemented as necessary and in accordance with WisDOT standards. If conditions warrant control of dust then a combination of water, calcium chloride suppressant and other dust control measures in compliance with industry standard will be applied.

Erosion control and shoreline stabilization during and following construction are other important considerations during construction. The WDNR has stressed the importance of implementing and maintaining proper erosion control measures. Erosion control requirements will be defined during design and in coordination with WDNR Chapter 30, Notice of Intent and Corp of Engineers CFR 404 permitting.

7.3.2 Archaeological

If any undiscovered archeological sites or human remains are encountered in the course of investigations at the project area or during construction, the work will have to stop immediately, and the Historic Preservations Division consulted.

7.3.3 Endangered Species

No impacts to endangered species are expected, as construction will take place only on the existing Facility site.

7.3.4 Wetlands

There are no known wetlands at the existing Facility site and no impacts to existing wetlands are expected. If wetlands are identified during the design phase, appropriate permits will be applied for and obtained from the relevant regulating agencies (in particular Corps of Engineers CFR 404 permit and WDNR Chapter 30 permit), and strict adherence to the conditions of any permit will be required. Any disturbed wetlands will be restored to pre-existing conditions, and therefore the long-term impacts to any wetlands are expected to be minimal.

7.4 Alternatives to the Proposed Action

The alternatives for modifications to the Facility are presented in Chapter 5. All of these alternatives require construction at the existing plant site and are considered equal in terms of environmental impacts. Cost comparisons of the alternatives are provided in Chapter 6 and in Appendix F.

8. FINANCES AND FUNDING

8.1 Total Project Cost Estimate

Table 8-1 presents the total estimated cost for the selected alternative for phased upgrades at the Facility.

Table 8-1 Total Project Cost Estimate

Items	Cost	
Phase 1 Loadings Upgrades		
Site Work	$	259,200
Receiving	$	833,621
Screening	$	547,870
Sludge Tanks	$	319,999
Centrate Storage Tanks	$	1,212,417
Chemical Feed Building	$	552,023
Construction Subtotal	$	3,725,131
Contractor Costs	$	335,262
Contingencies	$	406,039
Engineering, Admin, Legal	$	568,455
Resident Engineering	$	121,812
Total Cost Phase 1 Loadings	**$**	**5,156,699**
Phase 1 Biosolids Process Upgrades		
Lime Stabilization Equipment	$	60,826
Sludge Drying	$	8,391,519
Odor Control Equipment	$	315,386
Construction Subtotal	$	8,767,731
Electrical	$	876,773
Contractor Costs	$	868,005
Contingencies	$	1,051,251
Engineering, Admin, Legal	$	1,576,876
Resident Engineering	$	315,375
Total Cost Phase 1 Biosolids	**$**	**13,456,012**
Phase 2 Loadings Upgrades		
Centrifuge Dewatering Units	$	1,059,667
Sludge Pumping	$	415,942
Construction Subtotal	$	1,475,610
Contractor Costs	$	213,939
Contingencies	$	259,104
Engineering, Admin, Legal	$	362,746
Resident Engineering	$	77,731
Total Cost Phase 2 Loadings	**$**	**2,389,130**
Total Cost All Phases of Work	**$**	**21,001,840**

These costs include a 10% contingency and costs for engineering, administration and legal work that will be necessary to plan, design, finance and manage the project, as well as resident engineering costs for observation during the project.

8.2 Financing Methods

There are six possible methods of financing the proposed improvements. These include general obligation bonds, revenue bonds, special assessment bonds, direct loans from private institutions, financing through government programs, and immediate payment. Immediate payment is not possible because of the lack of available funds. Assessment bonds are eliminated because of the financial impact of the customers. That leaves four major financing methods for upgrades to the Facility, as described in the following sections.

As the Facility is owned by 11 member communities, financing for the proposed project would occur via each member, with a debt load of associate proportion to the stake in the Facility. Therefore, each member community will need to be a part of the financial planning and agree to the methods and debts prior to acquisition of a funding package. Multiple means of financing the project may be undertaken by each member community.

8.2.1 General Obligation Bonds

General obligation bonds are readily saleable, and the interest rate is relatively low. These bonds are not dependent on service charges although service charges can be used to provide the needed revenue. The total amount of general obligation bonds which can be issued by a municipality is limited by Wisconsin Statutes to 5% of the equalized valuation of the municipality. There are many serious disadvantages to this method of financing for projects such as this. First, it is possible that not all users of the new facilities would contribute to the support of the facilities. This would depend upon the method used to recover the payments for these bonds. Secondly, the use made of the biosolids facility will not necessarily be directly related to the value of a property utilizing the facilities. Third, the sale of general obligation bonds for a utility purpose can affect the credit rating issued to the municipality at the time of the sale of future bonds issues covering other general expenditures.

8.2.2 Revenue Bonds

The advantages of revenue bonds are that their sales do not affect the credit rating or bonding power of the municipality, and they are equitable in that the users of the system pay the capital cost of the facilities. Mortgage revenue bonds are very saleable in Wisconsin if the service charge is such that the net revenues of the utility, after expenses and depreciation, are approximately 1.25 times the debt retirement and operation and maintenance costs. The interest rate for these bonds generally is 1 to 2 percent greater than for general obligation bonds.

8.2.3 Direct Loans

The estimated cost of the proposed project is quite large, lessening the chance of direct loans from financial institutions or government agencies. Moreover, if available, the interest rates on direct loans may well be less than for either general obligation or mortgage revenue bonds. There are fewer restrictions on the method of revenue generation, and there is less effect on the bonding powers and credit rating of the community than with general obligation bonds.

8.2.4 Financing Through Government Programs

Past demand for improved wastewater treatment resulted in the institution of state and federal programs for financial assistance to communities undertaking the construction of wastewater treatment facilities improvements. The following Funding Sources section summarizes the government funding programs which may be available.

8.3 Funding Sources

8.3.1 State of Wisconsin Environmental Improvement Fund

The State of Wisconsin Environmental Improvement Fund (EIF) is managed and administered jointly by WDNR Environmental Loans (EL) and Department of Administration (DOA). EIF encompasses two environmental financing programs for local governments: the Clean Water Fund Program (CWFP), for wastewater and storm water infrastructure projects; and the Safe Drinking Water Loan Program (SDWLP), for drinking water infrastructure projects. The CWFP and SDWLP are revolving loan programs that combine federal grants and state funding to provide financial assistance to municipalities in the form of subsidized loans. Some municipalities may also be eligible for funding in the form of principal forgiveness (PF) based on population and median household income (MHI).

For eligible projects in disadvantaged municipalities with population of less than 10,000 population; and MHI less than or equal to 80% of the Wisconsin MHI, the interest rate is 33% of the market rate. For eligible projects of municipalities not meeting the financial need criteria, the interest rate is 55% of the market rate. The current market rate is 3.00% as of March 2020.
Only those communities whose treatment facilities are in basic compliance with effluent standards are eligible. For treatment plants in violation of effluent standards full financing is available, but at the full market rate. Additionally, the portion of projects for receiving and storing septage and capacity for treating septage can be financed at 0% interest through the
CWF program.

The relatively low interest rates offered by the CWF loan program are an attractive and feasible funding option for the Facility.

8.3.2 Rural Development (RD)

The Rural Development (RD) branch of the U.S. Department of Agriculture (USDA) provides financial assistance to small rural communities, those with populations of 10,000 or less. RD has a program in which it provides financial assistance in the form of grants and low-interest loans for construction of wastewater collection and treatment systems. The loans have a 40 year payback period and are classified as revenue bond type loans secured only by sewer and water use charges. The current interest rates range from 1.375% to 2.375% based on income levels and identified health and sanitary conditions that will be addressed by the project.

If funds are available, an RD grant may be combined with a loan to keep user rates reasonable. Grants are intended to benefit residential users and small commercial users, so the portion of the project which might benefit larger commercial users and industrial users would be deducted from the eligible project cost. To receive a grant, the user charge rates for the average residential customer are compared to a percentage of the median household income and the rates for other comparable communities and grant funds may be offered to keep user rates reasonable.

It is not expected for the Facility to be eligible for RD funding. Funding from RD has not been considered further.

8.3.3 Community Development Block Grant (CDBG)

The Community Development Block Grant (CDBG) program is a federal formula-allocated grant program under the U.S. Department of Housing and Urban Development (HUD). The State of Wisconsin, Department of Administration administers the state Community Development Block Grant program for public facilities (CDBG-PF), which provides grant money to expand and improve public infrastructure and facility projects critical to community vitality and sustainability. A municipality can qualify for this grant under several conditions, i.e., low and moderate income, urgent need or economic development. These grants are highly competitive and may require multiple attempts before obtaining. It is not likely that the Facility would qualify for a CDBG and this funding source has not been considered further.

8.3.4 Other Funding Programs

Focus on Energy incentive programs are available to municipal customers of participating Wisconsin utilities to implement energy efficiency projects. Prescriptive incentives are offered for standard energy efficient technologies that have predictable and predetermined savings, including lighting, many HVAC measures, motors and drives, and others. Custom incentives are available for technologies such as energy efficient aeration and heat recovery and are calculated on a case-by-case basis based on the estimated first year energy savings associated with a project/technology. Custom incentives may pay up to 50 percent of a project's cost, for a maximum of $200,000 and are available for projects that have a payback between 1.5 and 10 years. There may be opportunities for the City to apply for Focus on Energy incentives for the proposed Phase 1 construction.

8.4 Summary of Probable Financing

Any of the four practical financing methods may be used, i.e., general obligations bonds, revenue bonds, direct loans from private sources, or government program financing. It is likely that the best interest rates will be achieved through the Wisconsin CWF Loan program. For the purposes of this Facilities Plan, a CWF loan is assumed with 20-year loan terms.

8.5 Parallel Cost Percentage

The parallel cost percentage (PC) is calculated to determine that portion of the proposed total project cost eligible for below-market rate financing through the CWFP. Reference is made to NR 162 of the Wisconsin Administrative Code and the WDNR web page guidance for the basis of calculating parallel cost percentages.

The Design Capacity (DC) used for the PC calculations is the projected design load, through Phase 2, presented in Table 4-3 and that was used for the project costs developed in Chapter 6. In order to calculate the value for PC, a reduced capacity loading condition (RC) is determined that reduces the DC by those amounts associated with unsewered areas that are not currently connected to the sanitary system; the reserve capacity for loadings which will be realized beyond ten years from the project completion date; and for current and future flows from industrial wastewater users.

Since construction of the planned improvements for the Facility will be completed in phases over the next 20 years, the parallel cost ratio calculations have also been divided into phases. Phase 1 is required improvements to the Facility to meet current needs and projected growth over the next ten years. Phase 2 is proposed improvements to the Facility to meet projected growth after the first ten years.

An estimate has been made of those projected contributions from Facility contributors which will not be realized until beyond ten years after the completion of the project. The future loadings described in Chapter 4 have been assumed to increase at 2% per year over the course of the design period of twenty years. For Phase 1 projections and modifications to the Facility, no reduced loading conditions exist, as the equipment replacements and modifications to structures does not include capacity for unsewered areas, capacity beyond ten years, or from industrial users. Therefore the Phase 1 loading conditions for design capacity and reduced capacity are equal. Phase 2 improvements, from loadings in Chapter 4, are entirely associated with capacity for loadings which will be realized beyond ten years from the project completion date. Therefore the RC loadings for Phase 2 are zero.

A summary of the original and revised costs and calculated parallel cost ratios are given below in Tables 8-2 and 8-3 for Phase 1 and Phase 2, respectively. The higher of the costs presented for the selected Alternative C2 is referenced in the PC costs. As presented in Chapter 4, these costs will vary depending on the ultimate biosolids storage option utilized at the Facility. In either case, the outcome of the PC is the same.

Table 8-2 Phase 1 Upgrades Parallel Cost Ratio

Item	DC Cost	RC Cost
Lime Stabilization Equipment	$60,826	$60,826
Sludge Drying	$8,391,519	$8,391,519
Odor Control Equipment	$315,386	$315,386
Electrical	$876,773	$876,773
Contractor Costs	$868,005	$868,005
Contingencies	$1,051,251	$1,051,251
Engineering/Admin	$1,576,876	$1,576,876
Resident Engineering	$315,375	$315,375
Alternative C2 Project Cost	$13,456,012	$13,456,012
Phase 1 Baseline Upgrades	$5,156,699	$5,156,699
Total Project Cost	$18,612,711	$18,612,711
PC = RC / DC = $18,612,711 / $18,612,711 = **100%**		

Table 8-3 Phase 2 Upgrades Parallel Cost Ratio

Item	DC Cost	RC Cost
Lime Stabilization Equipment	-	$0
Sludge Drying	-	$0
Odor Control Equipment	-	$0
Electrical	-	$0
Contractor Costs	-	$0
Contingencies	-	$0
Engineering/Admin	-	$0
Resident Engineering	-	$0
Alternative C2 Project Cost	-	$0
Phase 2 Baseline Upgrades	$2,389,130	$0
Total Project Cost	$2,389,130	$0
PC = RC / DC = $0 / $2,389,130 = **0%**		

8.6 Septage Percentage

The septage percentage (SP) is calculated to determine what portion of the below market rate financing through the CWFP will be eligible for zero rate financing. Reference is made to the resource paper entitled "Wisconsin WDNR Program for Septage Considerations in Municipal Wastewater Facility Planning and for Application of Zero Percent Clean Water Fund Loans" dated June 7, 2006 and revised August 2012.

The Facility upgrades does not include provisions for septage receiving facilities or septage treatment capacity. Therefore, the septage percentage is zero and none of the costs are eligible for zero percent financing through the CWFP.

8.7 Revenue Sources

Wisconsin Statutes empowers a municipality to construct, maintain, and expand a wastewater system, and further, to collect the revenues to support such a system. There are five potential sources of revenue available to a municipality for support of the wastewater treatment facilities. They are as follows: (1) special assessments, (2) general fund revenues, (3) impact fees, (4) TIF fees and (5) service charges.

8.7.1 Special Assessments

The levy of special assessments is provided for by Section 66.07 of the Wisconsin Statutes. Generally, the special assessment principle is used primarily to recover the costs of services and facilities provided immediately adjacent to the property assessed. One additional use of the special assessment provision employed elsewhere from time to time is that of directly assessing the cost of major capital improvements. This is generally utilized in cases where no service charges are made but the governing body wishes to recover the cost of the improvements. It is more applicable to the financing of a collection system than to the treatment plant itself.

If a municipality were to provide the proposed wastewater treatment facilities as a general service, it would be possible to assess the costs of the improvement to the benefited parties. However, the municipality would not be able to do so unless the proper legal procedures were followed, and the assessment did not exceed the benefit received by the property assessed. Because of the difficulty in determining the differences in benefits between users and user classes and because of the magnitude of this assessment to present property owners, only, special assessments are not recommended for this project.

8.7.2 General Fund Allocations

General Fund monies from general taxation sources and other routine sources of municipal income can be used to pay for the subject project. A direct tax levy to recover the costs of this project which are not funded by grants-in-aids is possible. The use of general fund monies on a debt service basis is a potential method of financing. This would be accomplished through issuance of general obligation bonds (to be discussed in later section). Generally, this method of financing is reserved for street improvements, administration improvements and not for wastewater treatment facilities. This method of financing will not be used for the proposed project.

8.7.3 Impact Fees

Wisconsin Statute 66.0617 allows cities, villages, towns, and counties to assess impact fees on developers to offset the capital costs for public facilities needed as a result of the new development. The law requires municipalities that wish to utilize the connection fee or connection charge concepts to base these fees on sound concepts. A municipality has the option to implement an impact fee to assist in paying for improvements that are a result of development. These fees cannot be used to finance deficiencies of any system but for replacement of systems that will not have adequate capacity to meet new user demands. Any implementation of impact fees will require a needs report (this document will meet that requirement), breakout of costs to present and future users, an ordinance regulating the fees, development of an accounting system to segregate the fees and a public hearing on the ordinance.

The Facility can utilize this system and may want to consider impact or connection fees for future users. This method will not be used at this time for calculating the user charge rates. It should be noted that the same bond types can be used in conjunction with this system.

8.7.4 Tax Increment Finance District (TIF)

Municipalities can develop tax increment finance districts to assist in financing wastewater improvements. To utilize this approach, the municipality would have to identify some specific boundaries of land that is mostly undeveloped but is anticipated to be developed in the near future. The percentage of cost of the proposed project that is related to the potential development of this area included in the TIF district can be paid by the increment of the TIF district. The tax increment is the amount of tax money collected between the value of the district at the time of formation to value of the property after development. This tax increment can be used to pay off projects that have been included in the TIF Plan. This method of financing is a very viable alternative and can be considered. This method of financing will not be used for calculating the revised user charge rates.

8.7.5 Service Charges

Wisconsin Statute 66.0821(3) empowers a City to establish service charges in such amount as to meet all the financial requirements for the construction, reconstruction, improvement, extension, operation, maintenance, repair, and depreciation of a wastewater system. Further, such service charges may be adjusted to cover the payment of all principal and interest of any indebtedness incurred thereof, including the replacement of funds advanced by or paid for the general fund of the municipality. These charges may include a reasonable excess and the actual basis of the charges is at the discretion of the appointed/elected governing members.

To date, the Facility has used service charges to generate revenue for maintenance and operation of the Facility and this is the anticipated revenue source for future improvements.

8.8 Financial Considerations

8.8.1 Revenue Sources and Current User Rates

The Facility collects revenues through user service charges and currently services 11 member contributors and 10 non-member communities. Rates are annually computed at the end of each calendar year, based on the following:

- The total operation and maintenance (not including transportation cost) cost for the year divided by the total number of pounds of biosolids processed by the Facility for the year multiplied by the number of pounds of biosolids delivered by the member for the year; plus

- The total of interest and principle payment made for the year divided by the total number of pounds of biosolids processed by the Facility for the year multiplied by the number of pounds of biosolids delivered by the member; plus

- The administrative cost per user, determined as follows: Amount not to exceed the Total Accounting & Collection, Administration, Engineering, Training & Travel, and Insurance cost divided by the total number of users on January 1, of each year; plus

- Plus transportation cost per hauling contract, per contributor

The contracted non-member contributors to the Facility have rates that follow a similar computation, but are applied a surcharge not to exceed 10% of the calculated charges.

Due to the increase in Facility expenses, user charges will need to be increased to cover the cost of the proposed project, as described in Section 8.9.

8.8.2 Operating Expenses

The Facility's current annual operating budget is approximately $2,500,000 for 2020. The projected operating costs for the recommended Facility improvements are approximately $2,400,000 to $2,500,000 per year and are expected to increase with inflation. Detailed estimates of these costs are provided in Appendix F.

8.8.3 Equipment Replacement Fund

A municipality receiving a loan from the CWFP is required to establish an equipment replacement fund to be used only for expenses incurred for equipment related to the municipality's wastewater treatment works. The Facility has a replacement fund and is actively making annual deposits. There will be additions and changes to the equipment as part of the proposed project and additional funding of the equipment replacement fund is recommended. Calculations of a proposed replacement fund deposit are provided in Appendix F and will be updated upon implementation of the project.

8.8.4 Debt Repayments and Debt Reserves

The Facility does not carry any existing debt associated with loans or repayments. Future debt and impacts to user charges for the proposed project are addressed in Section 8.9.

8.8.5 Other Capital Improvements

There are no other capital improvements planned at the Facility outside of the documented deficiencies in this Facilities Plan. Repairs and improvements at the Facility have been made using funds from the Facility's Replacement Fund to refrain from taking on new debts.

8.9 Projected User Charge Rates

The projected user charge impact for the Facility needs to take several components into consideration and can best be analyzed using a cash flow schedule. The expense components of the cash flow include existing expenses (administrative, operations, maintenance/capital, transportation, marketing, and replacement fund) and proposed expenses associated with principal and interest payments for the proposed project, changes in O&M costs, and replacement fund additions. The revenue components of the cash flow are revenue from current rates as described in Section 8.8.1 and interest income. Utilizing the schedule, an estimate of the additional revenue requirement can be calculated, which would translate to a rate increase for member and non-member contributors.

Appendix I provides a user charge impact estimate for either Alternative C2 scenario, using silos or bagging for Class A biosolids storage. As stated in Section 8.4, it is expected that CWFP loans will be used to fund Facility improvements. The additional revenue required was most notably impacted by the new debt load, and resulting principal and interest payments for the proposed project. The debt was calculated with a 2.5% interest rate with a 19 year amortization schedule, no principal forgiveness or grant funding, and no increases in the number of contributing communities.

User charges for the Facility will need to increase enough to generate sufficient revenues to offset new and existing expenses. When combining the total project efforts of Phase 1 and Phase 2, the required annual revenue increase is between approximately $1.1 million and $1.6 million, or 49% and 72% of the existing total budget, depending on the biosolids storage option pursued. When transportation is removed from the impact evaluation, the increase to the annual O&M budget is approximately 74% to 108%. Based on the annual rate calculation described in Section 8.8.1, the Facility would need to generally anticipate increases of this magnitude in order to ensure sufficient revenue is generated each year. It should be noted that other revenue generating sources can be utilized such as impact fees, grants, energy grants and other funding mechanisms. If these methodologies are implemented, the rate impact would be reduced accordingly.

8.10 Implementation Steps and Schedule

The implementation schedule in Table 8-4 is based on the proposed phases of construction described in Section 6.10. The Facility intends to apply for funding through the CWFP to finance construction and will be subject to timelines for this loan program, as well as requirements for agency review, approval, and permitting. Plan review for process improvements will be performed by the WDNR. Division of Safety and Professional Services (DSPS) plan review is required for public buildings 25,000 cubic feet or larger, which is anticipated for the new sludge drying area. Permits that may be required include WDNR Chapter 30 permit, Water Resources Application for Project Permits (WRAPP) and Corp of Engineers CFR 404 permitting.

The actual schedule will depend on the availability of financing, possible interim financing costs, and Facility decisions on the ultimate phasing of construction projects.

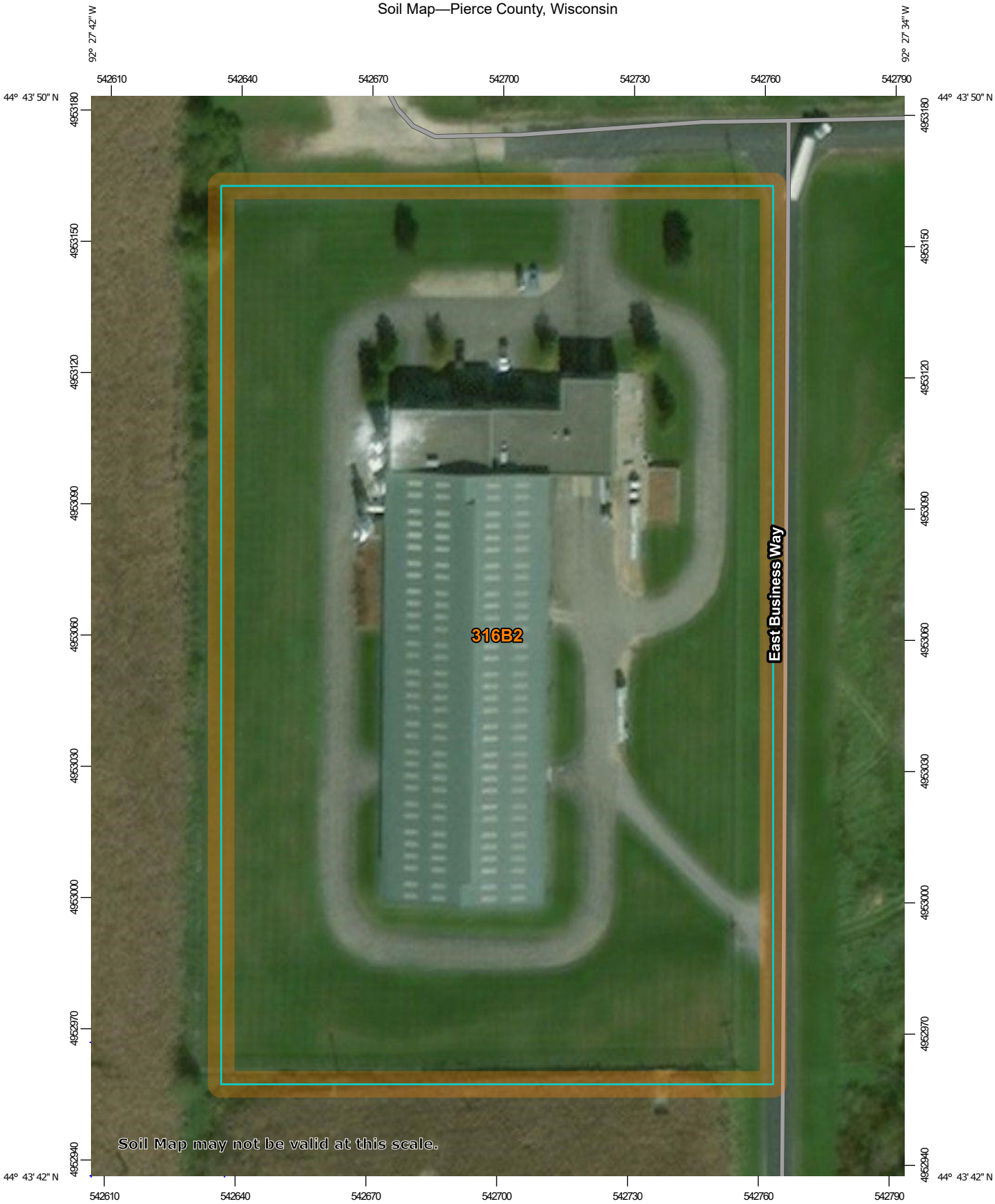
Table 8-4 Proposed Implementation Schedule

Action	Completion Date
Public Hearing on Plan	December 2020
Incorporate Public Hearing comments into the Final Facilities Plan	December 2020
Submit Facilities Plan to WDNR	December 2020
WDNR Approval of Facilities Plan	March 2021
Phase 1 Design	Dependent upon negotiations with member communities
Phase 1 Construction	
Phase 2 Design*	2028
Phase 2 Construction*	2029

*Tentative dates provided. Actual timing will depend on Facility loadings

APPENDIX A

Soils Information



Map Scale: 1:1,200 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pierce County, Wisconsin
Survey Area Data: Version 19, Sep 14, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 4, 2010—Jun 6, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
316B2	Ella silt loam, 1 to 6 percent slopes, moderately eroded	6.4	100.0%
Totals for Area of Interest		**6.4**	**100.0%**

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Pierce County, Wisconsin

January 22, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

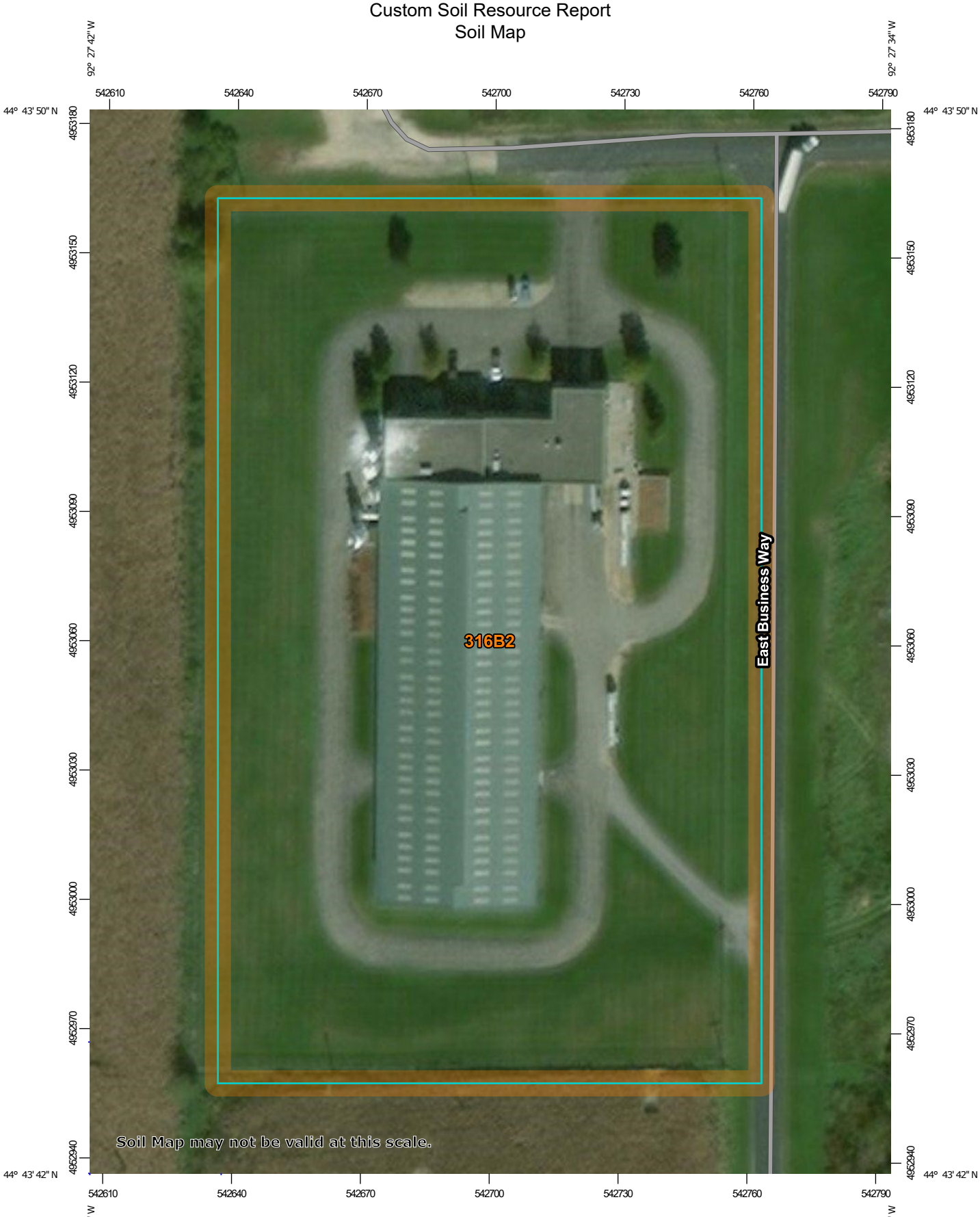
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,200 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pierce County, Wisconsin
Survey Area Data: Version 19, Sep 14, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 4, 2010—Jun 6, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
316B2	Ella silt loam, 1 to 6 percent slopes, moderately eroded	6.4	100.0%
Totals for Area of Interest		**6.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Pierce County, Wisconsin

316B2—Ella silt loam, 1 to 6 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2xplx
Elevation: 560 to 1,740 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 120 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ella, moderately eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ella, Moderately Eroded

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty alluvium over stratified sandy and silty alluvium

Typical profile

Ap - 0 to 8 inches: silt loam
Bt - 8 to 55 inches: silt loam
2Bt - 55 to 72 inches: silt loam
2C - 72 to 79 inches: silt loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 11.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Forage suitability group: High AWC, adequately drained (G105XY008WI)
Hydric soil rating: No

Minor Components

Plumcreek, moderately eroded

Percent of map unit: 5 percent

Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Festina, moderately eroded

Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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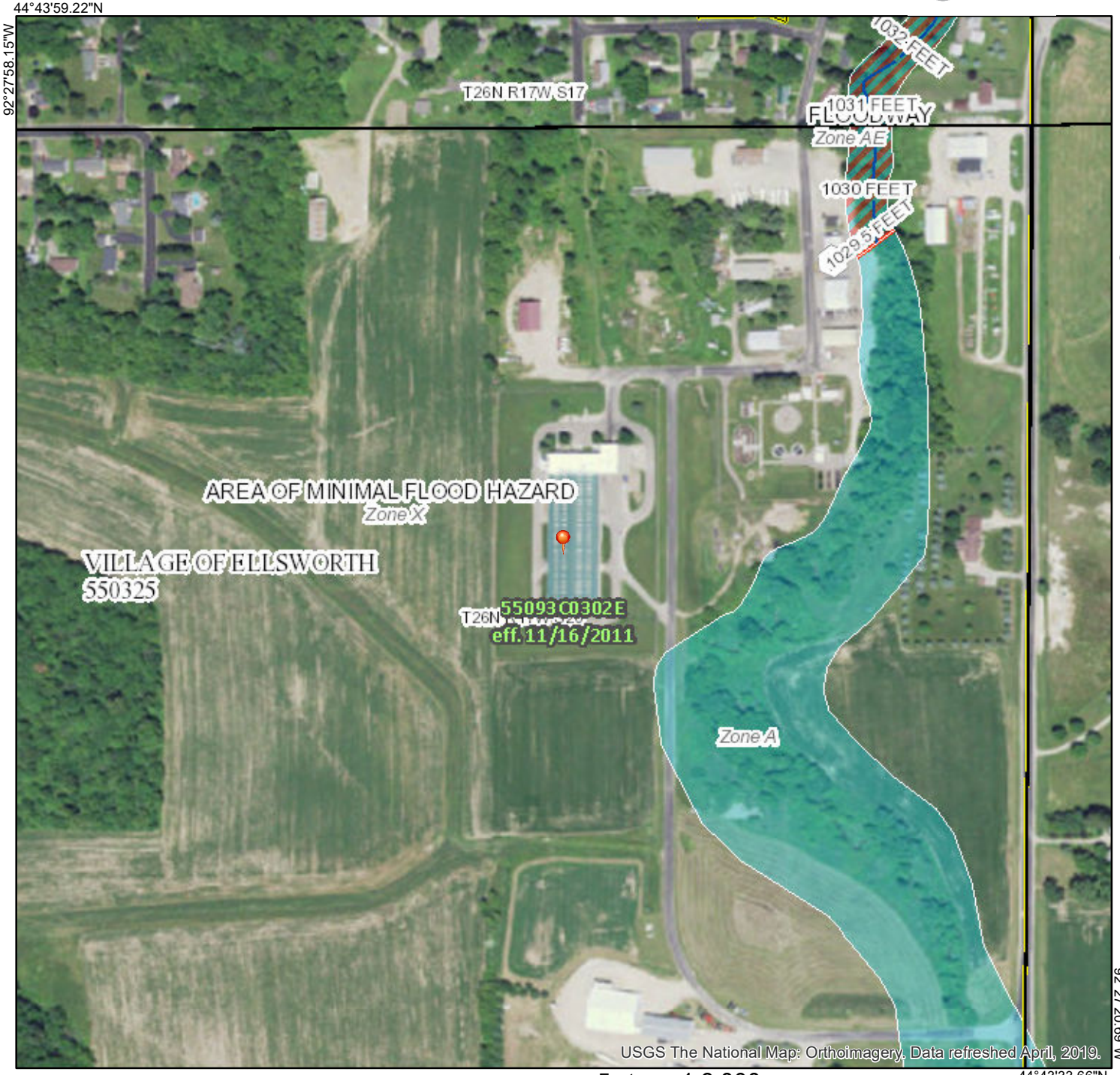
APPENDIX B

Water Resource Information

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

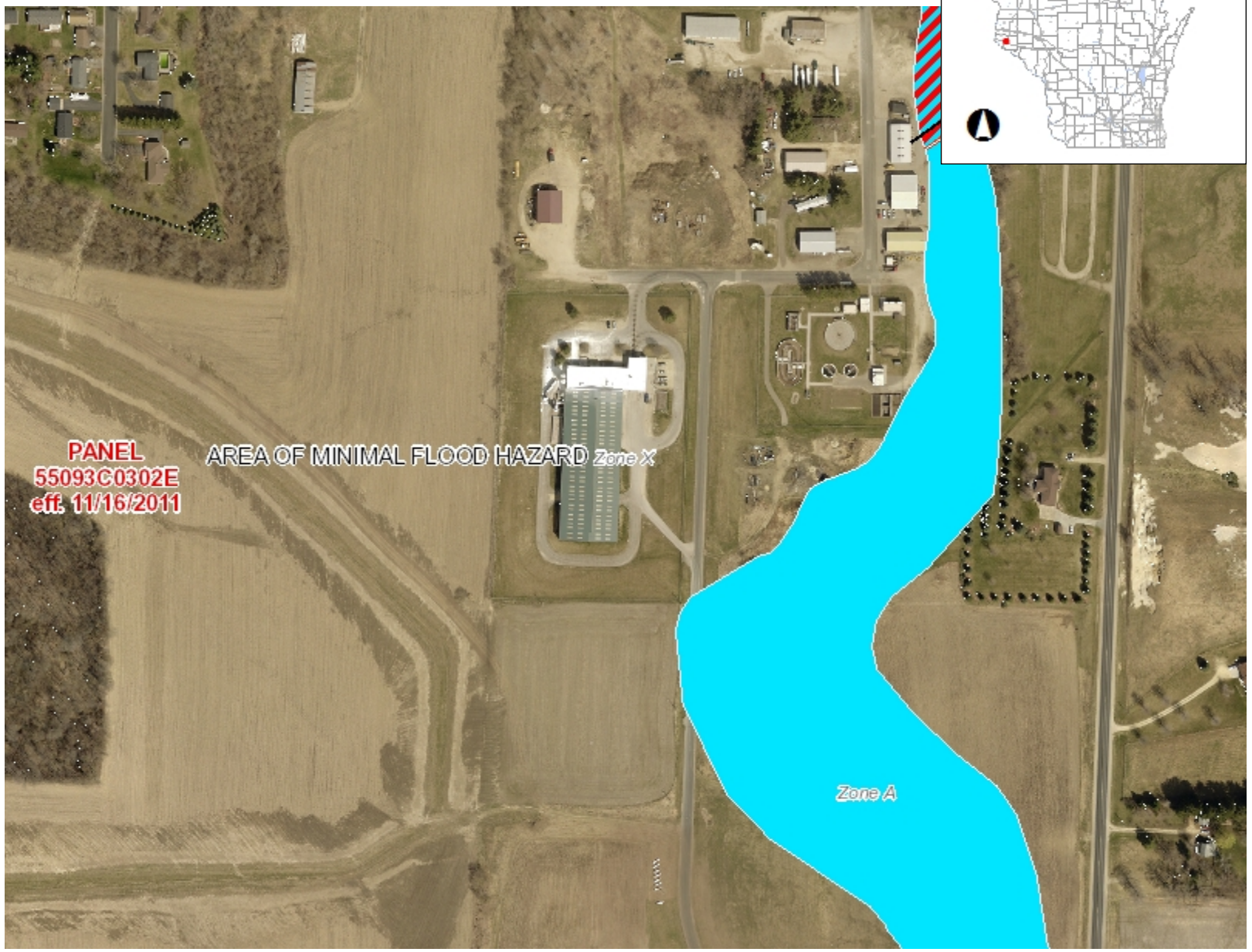
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/28/2020 at 2:49:24 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

WCWBF Site- Floodplain



Legend

- Dams
  - Dams with FERC License
  - Dams
- Floodplain Analysis Lines
  - Other
  - Flood Insurance Study
  - Letter of Map Revision
  - Case By Case Analysis
  - Bridge
- Floodplain Analysis Points
  - Other
  - Flood Insurance Study
  - Letter of Map Revision
  - Case By Case Analysis
  - Bridge
- Floodplain Storage
- FERC Project Area Boundaries
- Cross Sections
- Floodplains
  - Flood Fringe
  - Floodway
- FIRM Panels
- Cross-Sections
- Flood Hazard Boundaries
  - Other Boundaries
  - Limit Lines
  - SFHA / Flood Zone Boundary
- Flood Hazard Zones
  - 1% Annual Chance Flood Hazard
  - Regulatory Floodway
  - Special Floodway
  - Area of Undetermined Flood Hazard
  - 0.2% Annual Chance Flood

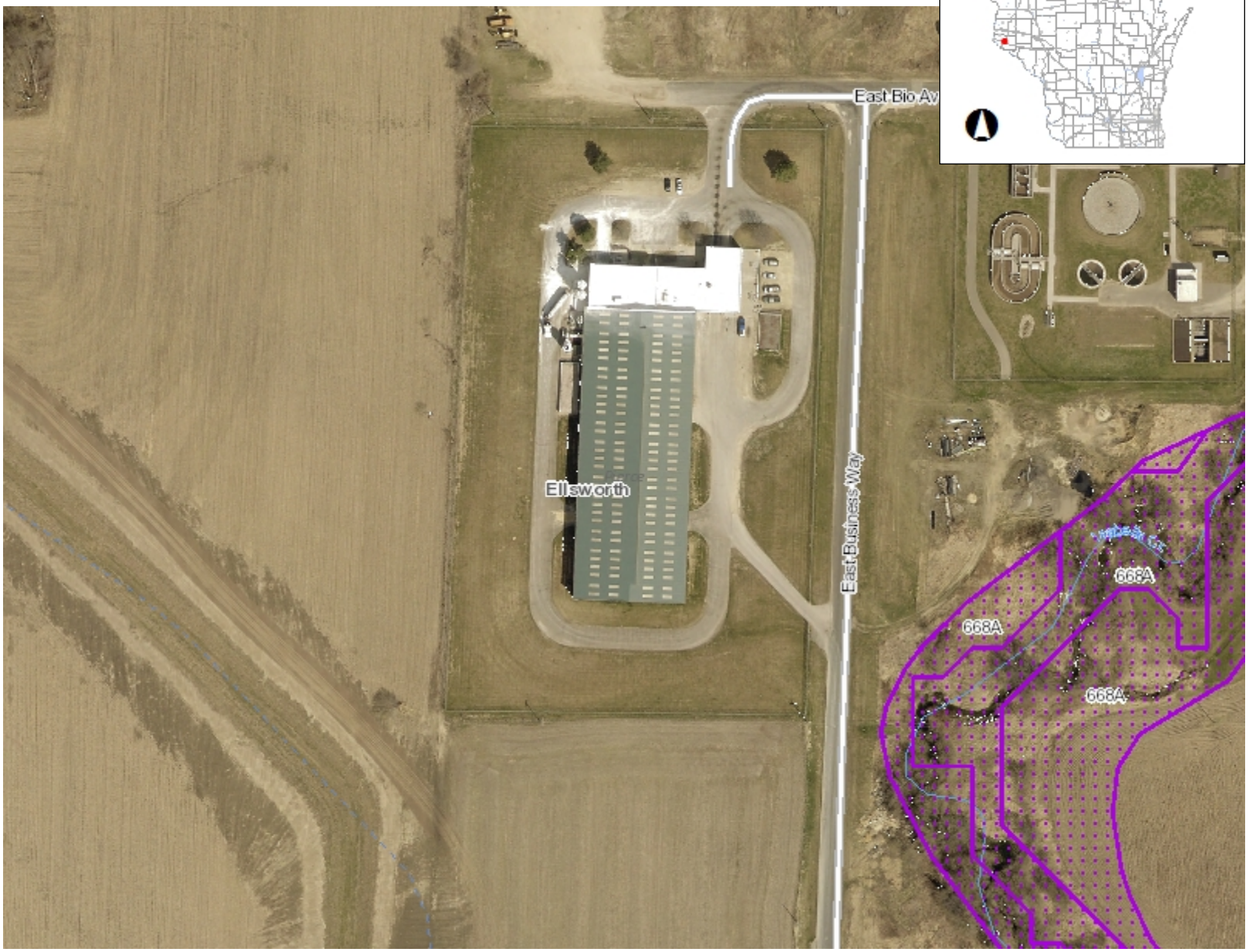
Notes

0.1 0 0.06 0.1 Miles

NAD_1983_HARN_Wisconsin_TM

1: 3,805

West Central Biosolids Facility
Existing Facility Site- Wetlands



Legend

- Waterway and Wetland Alterations
- Informal Actions
- Exemption Determinations
- Ordinary High Water Mark Determinations
- Wetland Identifications and Confirmations
- Navigability Determinations
  - Yes
  - Yes with Agricultural Exemption
  - No
- Surface Water Outfalls
- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
- Filled Points
- Wetland Class Areas
  - Wetland
  - Upland
- Filled Areas
- NRCS Wetspots
- Maximum Extent Wetland Indicators
- County Boundary
- Cities, Towns & Villages
  - City
  - Village
  - Civil Town
- Index to EN_Image_Basemap_Leaf_Off

Notes

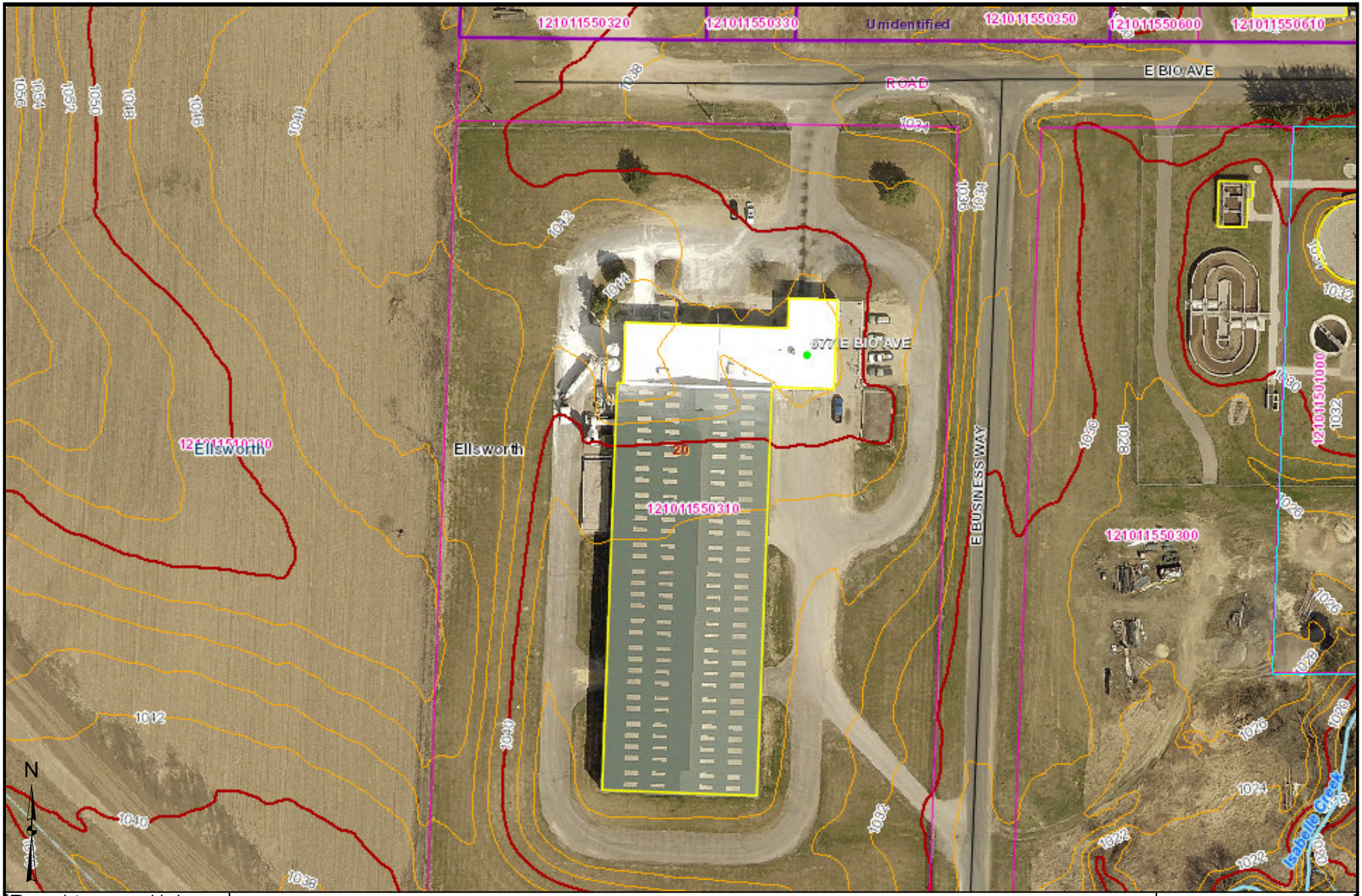
0.1 0 0.03 0.1 Miles

NAD_1983_HARN_Wisconsin_TM

1: 1,980

APPENDIX C

Existing Facility Information



These data are provided on an "AS-IS" basis, without warranty of any type, expressed or implied, including but not limited to any warranty as to their performance, merchantability, or fitness for any particular purpose.

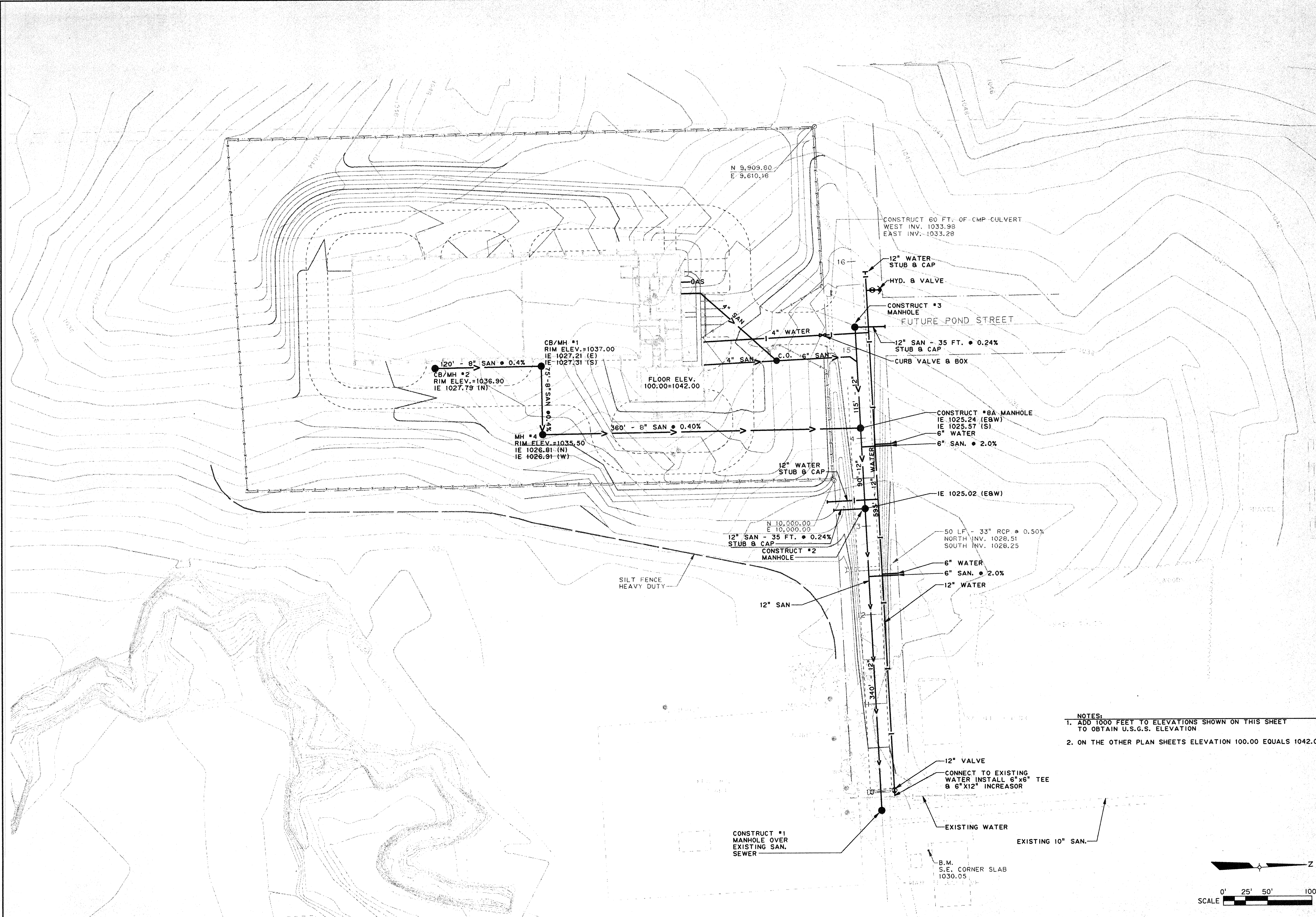
West Central Wisconsin Biosolids Facility

Pierce County, WI

1:1,200

Date: 1/22/2020

This map is not a substitute for accurate field surveys or for locating actual property lines and any adjacent features.



NOTES:
1. ADD 1000 FEET TO ELEVATIONS SHOWN ON THIS SHEET TO OBTAIN U.S.G.S. ELEVATION
2. ON THE OTHER PLAN SHEETS ELEVATION 100.00 EQUALS 1042.00

NAMES		DATE
DRAWN:		6/95
DESIGN:		6/95
CHECKED:	RRT	6/95
PE:		6/95
APP'D:		
APP'D:		
APP'D:		

NO.	REVISIONS	MADE	CHK	DATE

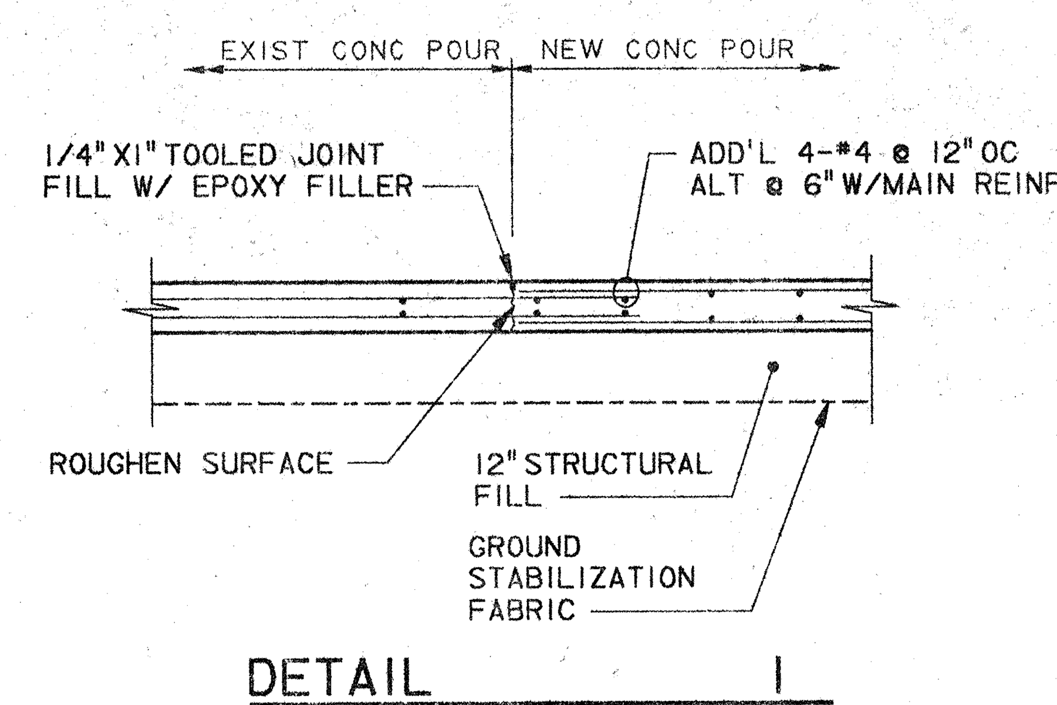
RUST
Rust Environment & Infrastructure Inc.
A Rust International Company

WEST CENTRAL WISCONSIN BIOSOLIDS FACILITY ELLSWORTH, WISCONSIN

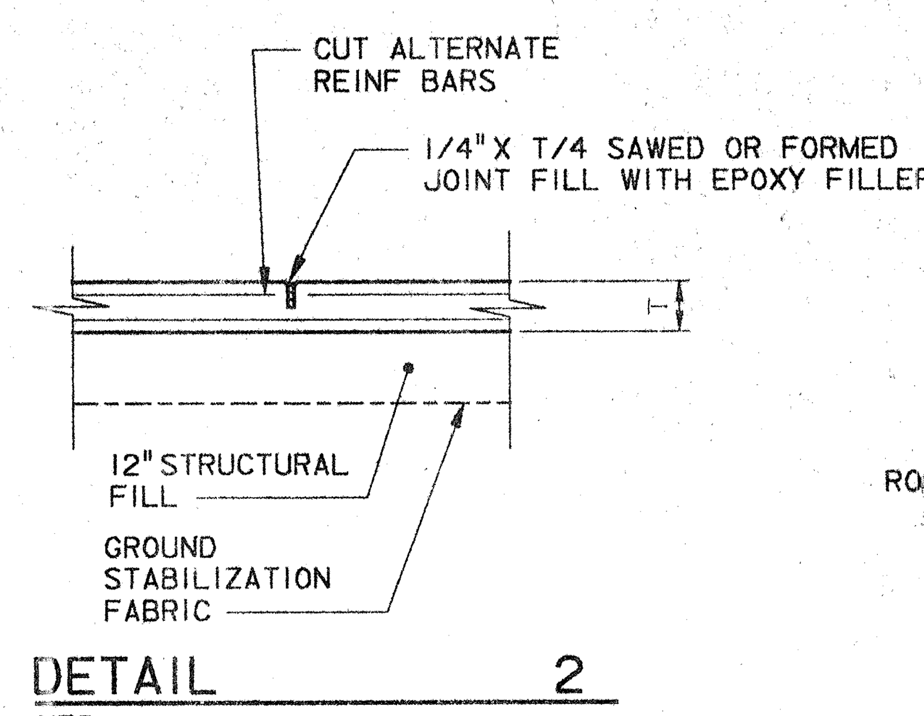
SITE UTILITY PLAN

DATE 6/95
SHEET NO. 10
FILE NO. A-67317
PROJECT No. 43317
CLIENT DRAWING NO.
02-C-2
RUST DRAWING NO.

is07/usr5/project/156227/



DETAIL 1
NTS



DETAIL 2
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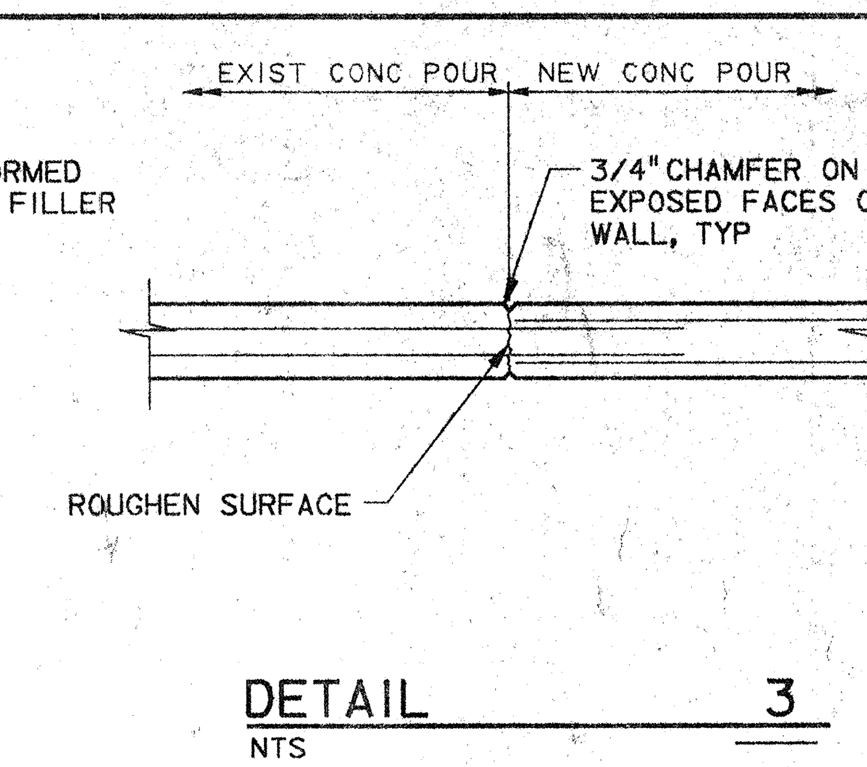

DETAIL 3
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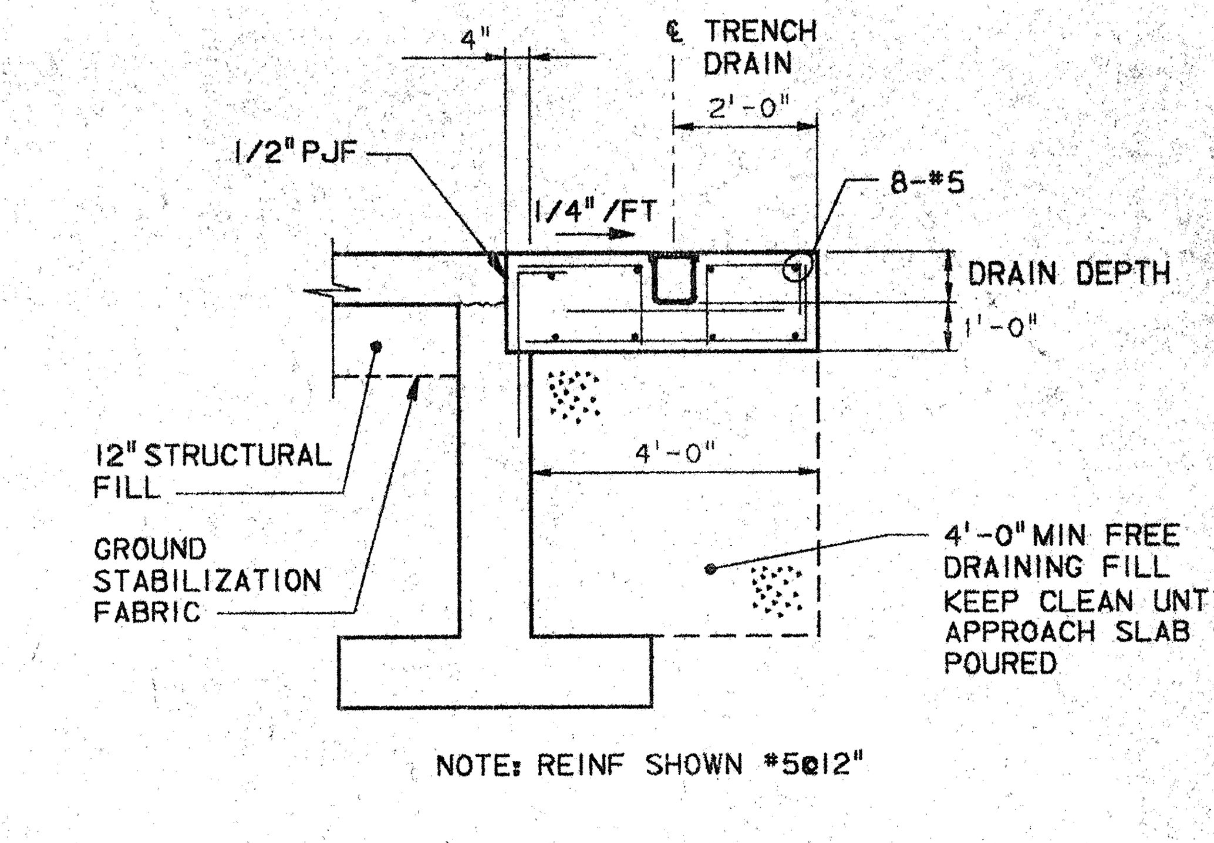

DETAIL 4
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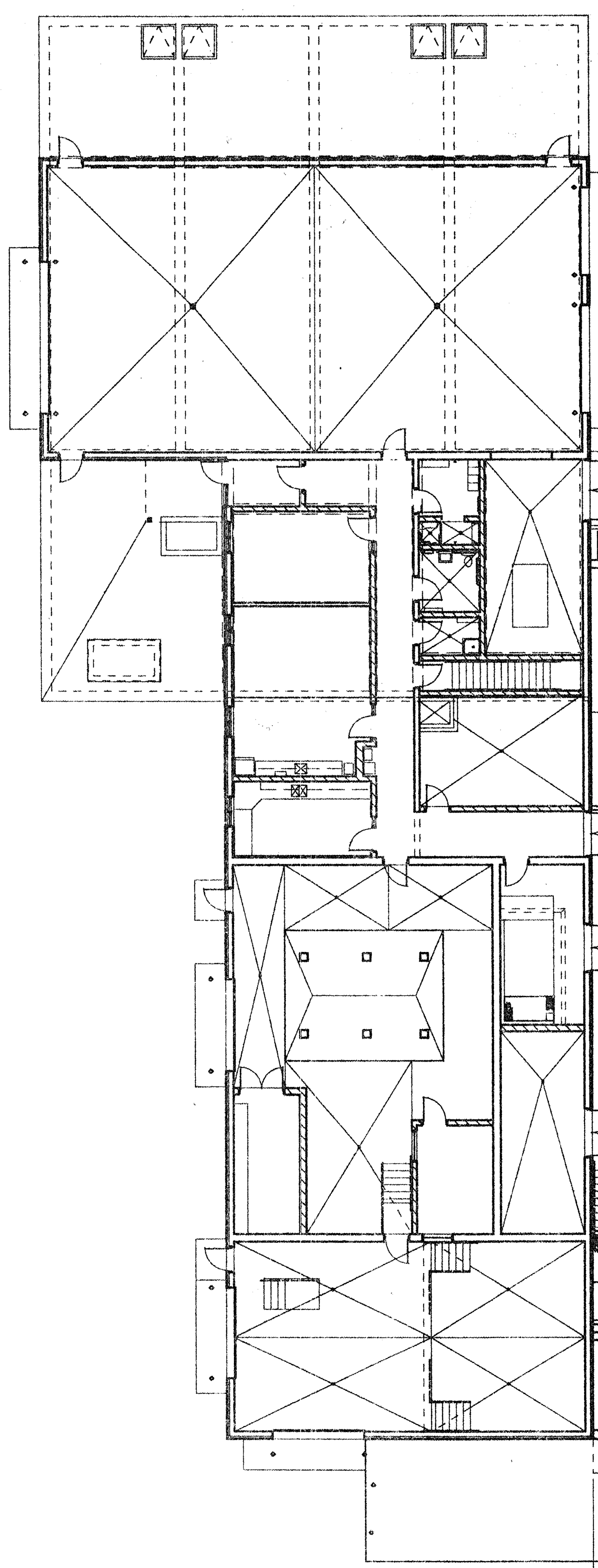
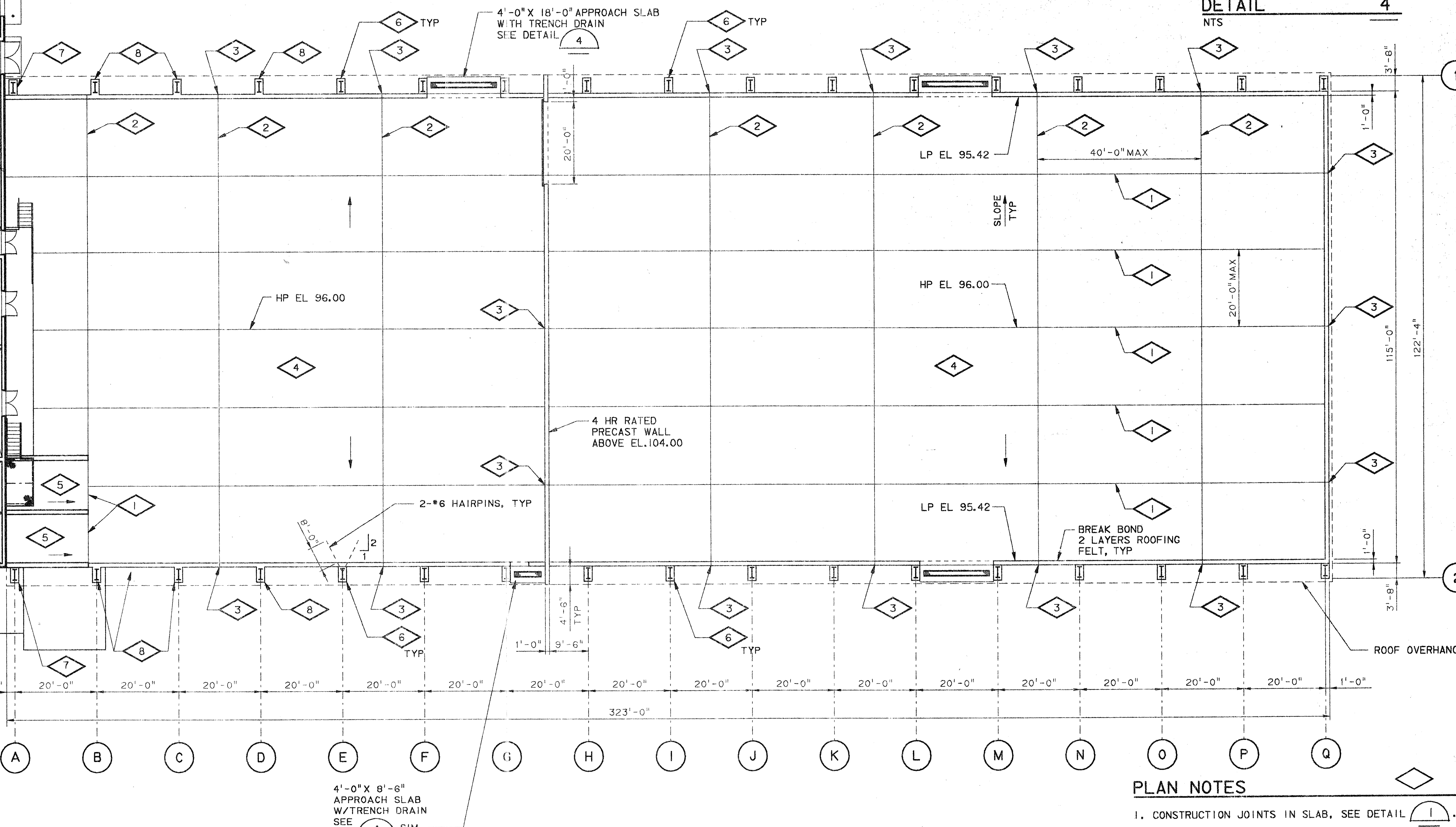
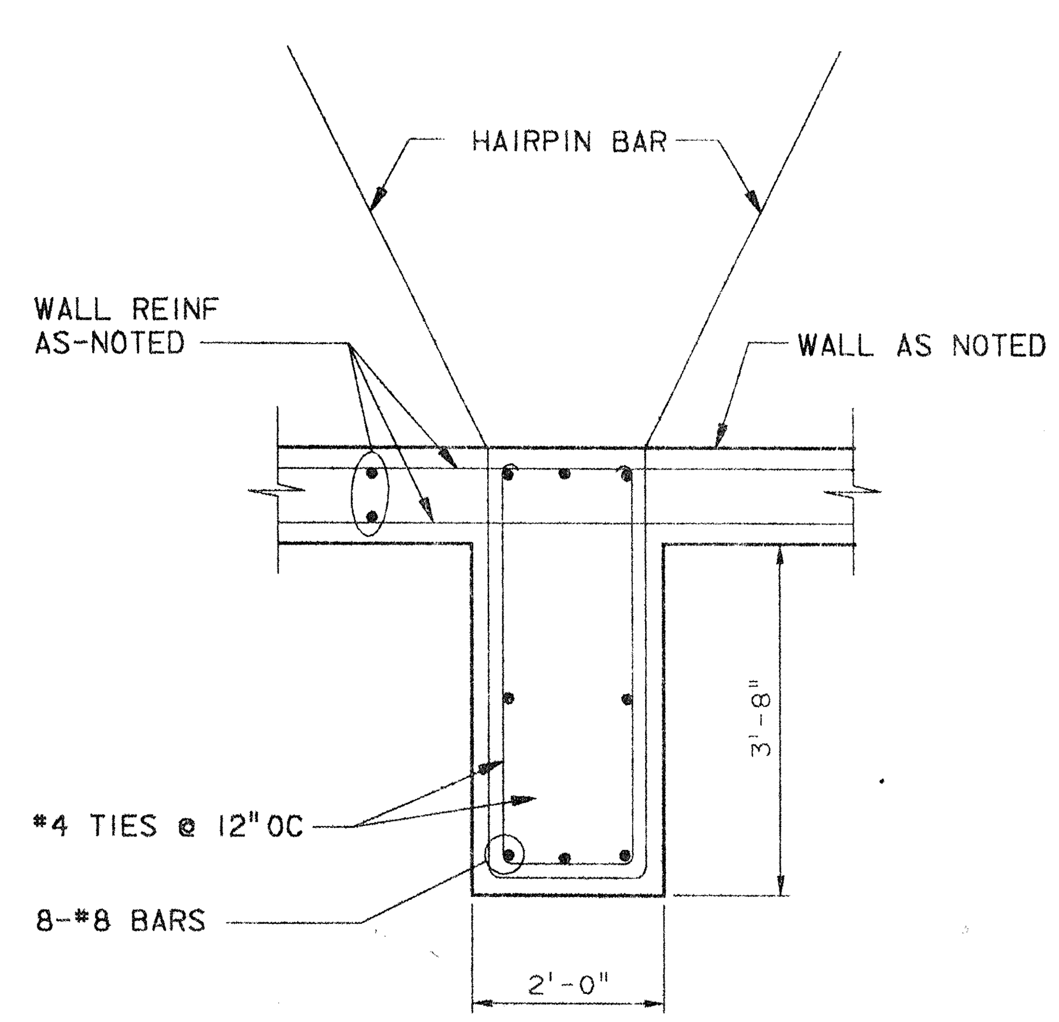



FIRST FLOOR PLAN
1/16" = 1'-0"



FOUNDATION PIER DETAIL 5
1/2" = 1'-0"

PLAN NOTES

1. CONSTRUCTION JOINTS IN SLAB, SEE DETAIL 1.
2. CONTROL JOINTS IN SLAB, SEE DETAIL 2.
3. CONSTRUCTION JOINTS IN WALL, SEE DETAIL 3.
4. 8" SLAB WITH #4@12" EW EF.
5. 12" SLAB WITH #4@12" EW EF.
6. CONCRETE PIER, SEE 5 T/ PIER EL 96.00
7. CONCRETE PIER, SEE 5 T/ PIER EL 103.33
8. CONCRETE PIER, SEE 5 T/ PIER EL 102.00

NAMES		DATE
DRAWN:	MLJ	9/95
DESIGN:	WHM	9/95
CHECKED:	PJE	9/95
PE:	RRT	9/95
APP'D:		
APP'D:		
APP'D:		

REVISIONS — NO. | MADE | CHK | DATE

Rust Environment & Infrastructure Inc.
A Rust International Company

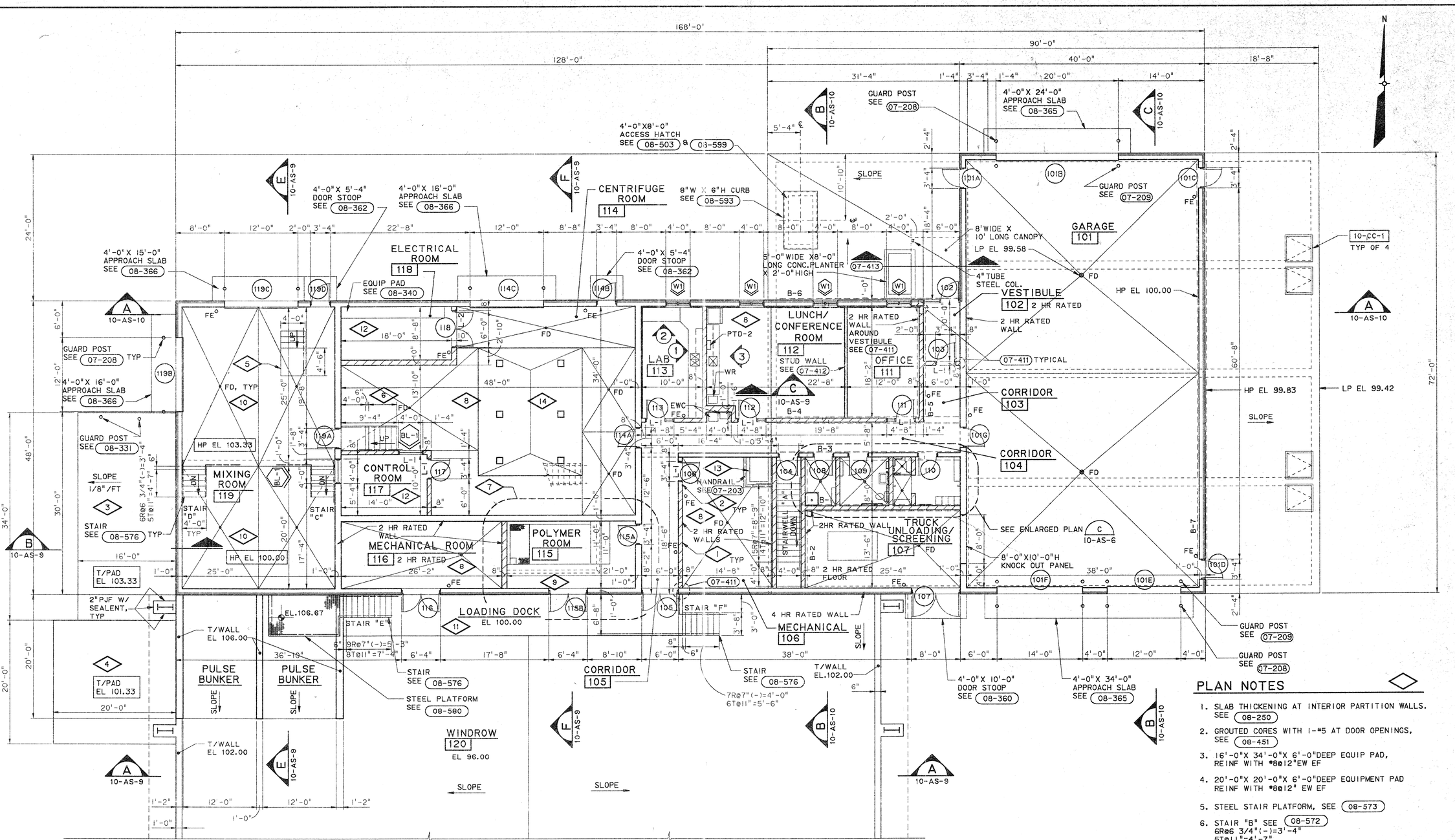
WEST CENTRAL WISCONSIN REGIONAL BIOSOLIDS FACILITY ELLSWORTH, WISCONSIN

ADMINISTRATIVE/PROCESSING BUILDING FLOOR PLAN AND DETAILS

DATE	9/95
SHEET NO.	21
FILE NO.	A-67306
PROJECT No.	43317
CLIENT DRAWING NO.	

10-AS-4
RUST DRAWING NO.

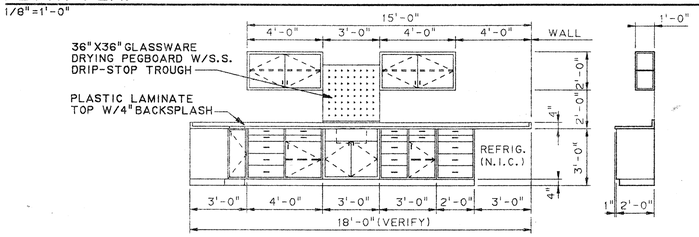
ls07/usr5/project/156227/ 10PLNIW.STU



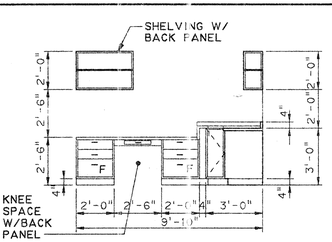
FLOOR PLAN
1/8"=1'-0"

PLAN NOTES

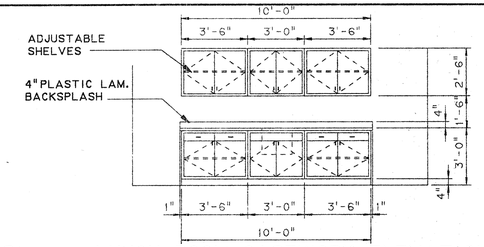
1. SLAB THICKENING AT INTERIOR PARTITION WALLS. SEE 08-250
2. GROUTED CORES WITH 1-#5 AT DOOR OPENINGS, SEE 08-451
3. 16'-0"X 34'-0"X 6'-0"DEEP EQUIP PAD, REINF WITH #8@12"EW EF
4. 20'-0"X 20'-0"X 6'-0"DEEP EQUIPMENT PAD REINF WITH #8@12" EW EF
5. STEEL STAIR PLATFORM, SEE 08-573
6. STAIR "B" SEE 08-572
   6R@6 3/4"(-)=3'-4"
   5T@11"=4'-7"
7. SEE ENLARGED FLOOR PLAN. B 10-AS-6
8. 6"CONC SLAB, FIBER REINF AND WWF, 6"STRUCTURAL FILL W/ VAPOR BARRIER OVER COMPACTED SUBGRADE.
9. 6"CONC SLAB REINF W/ #4@12"TOP, 6"STRUCTURAL FILL W/ VAPOR BARRIER OVER COMPACTED SUBGRADE.
10. 8"CONC SLAB REINF W/ #4@12"EW EF, 6"STRUCTURAL FILL W/VAPOR BARRIER OVER COMPACTED SUBGRADE.
11. 10"CONC SLAB REINF W/ #4@12" EW EF.
12. CEILING 8"PRECAST PLANK W/2"CONC TOPPING.
13. 4'-0"X 5'-0" HVAC CHASE, SEE 08-396
14. SEE A 10-AS-6 & D 10-AS-6 FOR ENLARGED FLOOR PLAN AND MEZZANINE PLAN.



LAB CASEWORK ELEVATION 1
1/4"=1'-0"



LAB CASEWORK ELEVATION 2
1/4"=1'-0"



LUNCH ROOM CASEWORK ELEVATION 3
1/4"=1'-0"

NO.	REVISIONS	MADE	CHK	DATE

	NAMES	DATE
DRAWN:	MLJ	9/95
DESIGN:	WHM	9/95
CHECKED:	PJE	9/95
PE:	RRT	9/95
APP'D:		
APP'D:		
APP'D:		

RUST
Rust Environment & Infrastructure Inc.
A Rust International Company

WEST CENTRAL WISCONSIN REGIONAL BIOSOLIDS FACILITY ELLSWORTH, WISCONSIN

ADMINISTRATIVE/PROCESSING BUILDING FLOOR PLAN

DATE	9/95
SHEET NO.	22
FILE NO.	A-67305
PROJECT No.	43317
CLIENT DRAWING NO.	10-AS-5
RUST DRAWING NO.	

APPENDIX D

Existing Biosolids and Centrate Data

West Central Wisconsin Biosolids Facility

Design Loadings

	2013			2014			2015			2016			2017			2018					
	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %			
January	401,749	1,890,937	2.55%	322,778	1,657,364	2.34%	274,970	1,413,344	2.33%	272,653	1,404,265	2.33%	319,996	1,508,373	2.54%	335,935	1,631,517	2.47%			
February	313,799	1,459,558	2.58%	266,564	1,348,665	2.37%	288,414	1,417,111	2.44%	306,521	1,451,478	2.53%	323,703	1,440,118	2.70%	318,133	1,408,443	2.71%			
March	319,240	1,554,927	2.46%	323,227	1,547,851	2.50%	324,010	1,615,103	2.41%	353,856	1,683,586	2.52%	349,617	1,579,253	2.65%	340,912	1,485,375	2.75%			
April	372,781	1,709,427	2.61%	343,308	1,567,897	2.63%	338,681	1,651,761	2.46%	321,555	1,560,452	2.47%	301,566	1,349,282	2.68%	327,410	1,394,204	2.82%			
May	344,325	1,649,485	2.50%	324,212	1,486,671	2.61%	307,265	1,589,179	2.32%	351,528	1,744,492	2.42%	372,890	1,657,665	2.70%	412,296	1,827,499	2.71%			
June	326,138	1,640,155	2.38%	348,803	1,665,614	2.51%	334,366	1,834,479	2.19%	329,753	1,755,703	2.25%	368,594	1,766,492	2.50%	328,282	1,570,452	2.51%			
July	332,415	1,751,944	2.28%	324,046	1,646,356	2.36%	301,438	1,694,508	2.13%	272,005	1,456,727	2.24%	282,025	1,447,707	2.34%	334,002	1,608,820	2.49%			
August	268,513	1,456,149	2.21%	277,895	1,363,179	2.44%	260,660	1,536,453	2.03%	305,907	1,717,231	2.14%	328,264	1,692,406	2.33%	315,540	1,621,384	2.33%			
September	253,736	1,410,010	2.16%	302,819	1,600,560	2.27%	284,495	1,550,717	2.20%	251,254	1,484,475	2.03%	278,834	1,426,135	2.34%	283,324	1,469,738	2.31%			
October	301,311	1,695,687	2.13%	313,444	1,725,677	2.18%	302,309	1,542,573	2.35%	288,247	1,579,704	2.19%	334,862	1,623,009	2.47%	348,205	1,755,171	2.38%			
November	273,056	1,483,216	2.21%	256,528	1,371,280	2.24%	291,548	1,454,352	2.40%	268,869	1,500,521	2.15%	299,205	1,527,016	2.35%	310,687	1,533,006	2.43%		Five-Year Avg		
December	299,097	1,502,476	2.39%	345,723	1,768,067	2.34%	349,918	1,692,097	2.48%	255,208	1,331,514	2.30%	321,696	1,542,468	2.50%	364,088	1,626,311	2.68%	lbs/month	gal/month	solids %
Annual Average	317,180	1,600,331	2.37%	312,446	1,562,432	2.40%	304,839	1,582,640	2.31%	298,113	1,555,846	2.30%	323,438	1,546,660	2.51%	334,901	1,577,660	2.55%	315,153	1,570,928	2.41%
Max Month 1	401,749	1,890,937	2.61%	348,803	1,768,067	2.63%	349,918	1,834,479	2.48%	353,856	1,755,703	2.53%	372,890	1,766,492	2.70%	412,296	1,827,499	2.82%			
Max Month 2	372,781	1,751,944	2.58%	345,723	1,725,677	2.61%	338,681	1,694,508	2.46%	351,528	1,744,492	2.52%	368,594	1,692,406	2.70%	364,088	1,631,517	2.75%			
Max Month 3	344,325	1,709,427	2.55%	343,308	1,665,614	2.51%	334,366	1,692,097	2.44%	329,753	1,717,231	2.47%	349,617	1,657,665	2.68%	348,205	1,631,517	2.71%			
Max Mon Avg	372,952	1,784,103	2.58%	345,945	1,719,786	2.58%	340,988	1,740,361	2.46%	345,045	1,739,142	2.51%	363,700	1,705,521	2.69%	374,863	1,696,844	2.76%	357,249	1,730,960	2.60%
Daily Avg.	20,087	94,547		17,440	88,403		17,496	91,724		17,693	87,785		18,644	88,325		20,615	91,374.95		18,663	90,360	
Weekly Avg	100,437	472,734		87,201	442,017		87,480	458,620		88,464	438,926		93,222	441,623		103,074	456,875		93,313	451,799	

MAX WEEK

	2015			2016			2017			2018			2019		
	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %
January	71,208	357,499	2.39%	70,841	361,432	2.35%	79,185	371,243	2.59%	79,535	387,163	2.43%	73,241	358,595	2.50%
February	77,465	363,864	2.55%	75,998	357,921	2.55%	89,104	399,028	2.57%	82,825	364,273	2.60%	86,027	381,905	2.58%
March	76,819	389,209	2.37%	82,494	390,106	2.54%	86,173	388,402	2.70%	87,872	377,849	2.58%	82,472	358,539	2.51%
April	87,152	417,533	2.50%	88,413	430,762	2.46%	78,939	359,976	2.62%	82,629	350,127	2.76%	99,005	428,054	2.68%
May	90,996	458,785	2.38%	94,146	452,480	2.49%	88,523	380,397	2.61%	103,613	460,135	2.74%	91,264	400,974	2.70%
June	85,096	455,235	2.24%	79,927	421,129	2.28%	89,048	412,163	2.48%	87,842	401,310	2.69%			
July	70,219	396,030	2.13%	77,125	405,399	2.28%	68,117	351,373	2.38%	90,768	420,183	2.59%			
August	63,516	366,155	2.08%	66,094	383,976	2.06%	73,317	372,507	2.44%	75,799	380,644	2.25%			
September	65,589	394,880	1.99%	67,299	390,995	2.06%	79,532	415,942	2.36%	76,333	398,165	2.27%			
October	78,752	387,676	2.44%	70,005	393,377	2.13%	76,036	363,099	2.42%	79,059	401,671	2.42%		Four-Year Avg	
November	75,614	396,091	2.29%	76,040	401,871	2.27%	81,748	400,081	2.48%	80,639	402,789	2.40%		2016-2019	
December	88,640	404,996	2.62%	63,554	363,537	2.10%	85,224	400,686	2.38%	97,627	412,603	2.54%		lbs	gal
Max Week	90,996	458,785		94,146	452,480		89,104	415,942		103,613	460,135		99,005	428,054		96,467	439,153

MAX DAY

	lbs	gal
2015	25,070	134,459
2016	24,047	130,371
2017	29,154	120,975
2018	31,257	140,470
2019	27,332	134,585
Average	27,372	132,172
MAX DAY	**31,257**	**140,470**

MAX ANNUAL

	lbs	gal
2013	3,806,160	19,203,971
2014	3,749,347	18,749,181
2015	3,658,072	18,991,677
2016	3,577,355	18,670,148
2017	3,881,253	18,559,924
2018	4,018,814	18,931,920
Average	3,781,833	18,851,137
MAX ANNUAL	4,018,814	19,203,971

West Central Wisconsin Biosolids Facility

Design Loadings-Members

	2013	2014			2015			2016			2017			2018					
	gal	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %			
January	1,420,671	272,278	1,345,927	2.43%	223,612	1,122,159	2.39%	226,308	1,085,728	2.50%	264,018	1,177,503	2.69%	280,177	1,251,262	2.68%			
February	1,062,955	224,855	1,071,331	2.52%	237,287	1,111,109	2.56%	254,849	1,127,376	2.71%	272,931	1,164,070	2.81%	274,462	1,137,513	2.89%			
March	1,094,152	274,117	1,229,781	2.67%	263,980	1,256,438	2.52%	294,154	1,308,336	2.70%	291,341	1,281,007	2.73%	288,167	1,178,231	2.93%			
April	1,239,841	294,886	1,263,221	2.80%	281,397	1,304,286	2.59%	266,839	1,227,117	2.61%	253,417	1,076,199	2.82%	281,130	1,119,180	3.01%			
May	1,139,099	255,955	1,138,849	2.69%	256,260	1,233,751	2.49%	279,817	1,336,595	2.51%	303,844	1,294,049	2.82%	347,937	1,432,435	2.91%			
June	1,036,299	275,487	1,322,746	2.50%	264,417	1,374,351	2.31%	255,692	1,295,241	2.37%	299,416	1,365,060	2.63%	163,377	764,215	2.56%			
July	1,160,452	271,250	1,335,349	2.44%	246,386	1,323,163	2.23%	214,560	1,094,418	2.35%	231,216	1,116,487	2.48%						
August	959,328	227,289	1,092,388	2.49%	213,039	1,217,427	2.10%	240,359	1,268,270	2.27%	267,925	1,322,629	2.43%						
September	696,261	239,313	1,243,294	2.31%	226,926	1,187,368	2.29%	200,355	1,138,317	2.11%	224,139	1,062,427	2.53%						
October	696,056	261,764	1,399,822	2.24%	234,645	1,171,444	2.40%	221,780	1,218,645	2.18%	276,838	1,238,529	2.68%						
November	1,151,625	206,886	1,066,491	2.33%	230,448	1,085,295	2.55%	213,088	1,154,114	2.21%	250,762	1,126,718	2.67%					Five-Year Avg	
December	1,171,629	299,515	1,468,229	2.45%	280,708	1,275,272	2.64%	220,087	1,100,151	2.40%	274,173	1,213,153	2.71%				lbs/month	gal/month	solids %
Annual Average	1,069,031	258,633	1,248,119	2.49%	246,592	1,221,839	2.42%	240,657	1,196,192	2.41%	267,502	1,203,153	2.67%	272,542	1,147,139	2.83%	257,185	1,203,288	2.56%
Max Month 1	1,420,671	299,515	1,468,229	2.80%	281,397	1,374,351	2.64%	294,154	1,336,595	2.71%	303,844	1,365,060	2.82%	347,937	1,432,435	3.01%			
Max Month 2	1,239,841	294,886	1,399,822	2.69%	280,708	1,323,163	2.59%	279,817	1,308,336	2.70%	299,416	1,322,629	2.82%	288,167	1,251,262	2.91%			
Max Month 3	1,171,629	275,487	1,345,927	2.67%	264,417	1,304,286	2.56%	266,839	1,295,241	2.61%	291,341	1,294,049	2.81%	281,130	1,178,231	2.93%			
Max Mon Avg	1,277,380	289,963	1,404,659	2.72%	275,507	1,333,933	2.60%	280,270	1,313,391	2.67%	298,200	1,327,246	2.82%	305,745	1,287,309	2.95%	289,937	1,333,308	2.75%
Daily Avg.	71,033.55	14,975.74	73,411		14,070	68,718		14,708	66,830		15,192	68,253		17,397	71,621.75		15,268	69,767	
Weekly Avg	355,168	74,879	367,057		70,349	343,588		73,539	334,149		75,961	341,265		86,984	358,109		76,342	348,834	

MAX WEEK

	2013	2014			2015			2016			2017			2018				
	gal	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %		
January	352,850	69,461	324,470	2.57%	58,393	287,546	2.39%	58,648	282,674	2.35%	71,027	304,633	2.56%	66,631	296,522	2.46%		
February	284,781	67,537	317,840	2.55%	64,306	288,475	2.55%	64,874	280,911	2.55%	73,532	298,750	2.68%	71,587	292,703	2.73%		
March	302,478	71,752	306,881	2.80%	62,244	306,505	2.37%	70,556	309,778	2.54%	71,168	315,833	2.69%	75,119	300,808	2.79%		
April	311,182	71,752	306,881	2.80%	75,529	340,799	2.50%	73,995	339,722	2.46%	66,594	290,012	2.66%	72,857	293,487	2.83%		
May	336,626	66,570	305,105	2.62%	76,599	368,154	2.38%	72,204	343,688	2.49%	75,150	307,297	2.79%	88,557	372,180	2.64%		
June	332,427	69,384	322,684	2.58%	63,644	331,290	2.24%	63,149	314,334	2.28%	69,979	310,289	2.59%	66,655	310,784	2.55%		
July	264,277	108,692	531,933	2.45%	58,064	311,020	2.13%	55,984	280,466	2.28%	56,185	286,373	2.32%					
August	267,343	57,196	279,887	2.45%	53,266	294,386	2.08%	53,344	286,084	2.06%	62,139	292,891	2.36%					
September	260,182	59,724	301,208	2.38%	53,194	304,053	1.99%	55,003	304,336	2.06%	61,369	286,689	2.29%					
October	264,834	60,510	321,430	2.26%	60,680	301,743	2.44%	62,794	333,428	2.13%	62,679	277,681	2.51%					
November	312,194	55,714	290,038	2.30%	62,393	308,773	2.29%	50,626	275,461	2.27%	66,961	277,476	2.31%				Five-Year Avg	
December	339,062	77,020	347,436	2.66%	71,833	304,422	2.62%	55,583	296,723	2.10%	78,296	334,509	2.55%				lbs	gal
Max Week	352,850	108,692	531,933		76,599	368,154		73,995	343,688		78,296	334,509		88,557	372,180		**85,228**	**390,093**

MAX DAY

	lbs	gal
2014	24,033	113,745
2015	22,378	104,286
2016	21,155	103,750
2017	27,040	106,400
2018	26,494	125,453
Average	24,220	110,727
MAX DAY	**27,040**	**125,453**

MAX ANNUAL-Member

	lbs	gal
2014	3,103,594	14,977,428
2015	2,959,106	14,662,063
2016	2,887,888	14,354,308
2017	3,210,018	14,437,831
2018	1,635,249	6,882,836
Average	3,040,152	14,607,908
MAX ANNUAL	3,210,018	14,977,428

West Central Wisconsin Biosolids Facility
Design Loadings-Non-Members

	2013	2014			2015			2016			2017			2018					
	gal	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %		Five-Year Avg	
																	lbs/month	gal/month	solids %
January	366,262	50,506	311,437	1.94%	51,124	291,185	2.11%	46,345	318,537	1.74%	55,978	330,870	2.03%	55,758	380,255	1.76%			
February	336,511	41,710	277,334	1.80%	51,161	306,002	2.00%	51,672	324,102	1.91%	50,772	276,048	2.21%	43,672	270,930	1.93%			
March	325,057	49,114	318,070	1.85%	60,174	358,665	2.01%	59,702	375,250	1.91%	58,276	298,246	2.34%	52,745	307,144	2.06%			
April	375,165	48,425	304,676	1.91%	57,315	347,475	1.98%	54,716	333,335	1.97%	48,150	273,083	2.11%	46,279	275,024	2.02%			
May	350,801	68,259	347,822	2.35%	57,078	355,428	1.93%	71,711	407,897	2.11%	69,046	363,616	2.28%	63,134	395,064	1.92%			
June	273,103	73,311	342,868	2.56%	69,853	460,128	1.82%	74,061	460,462	1.93%	69,177	401,432	2.07%	48,564	261,616	2.23%			
July	393,586	52,793	311,007	2.04%	55,052	371,345	1.78%	57,445	362,309	1.90%	50,810	331,220	1.84%						
August	201,849	50,601	270,791	2.24%	48,276	312,621	1.85%	65,548	448,961	1.75%	58,459	369,777	1.90%						
September	187,628	53,385	344,428	1.86%	58,206	363,349	1.92%	50,899	346,158	1.76%	54,695	363,708	1.80%						
October	262,130	51,680	325,855	1.90%	67,663	371,129	2.19%	66,467	361,059	2.21%	58,024	384,480	1.81%						
November	251,022	49,648	304,789	1.95%	61,769	364,616	2.03%	55,781	346,407	1.93%	58,413	400,298	1.75%						
December	324,028	46,212	299,838	1.85%	69,234	416,825	1.99%	35,121	231,363	1.82%	49,826	329,315	1.81%						
Annual Average	303,929	52,970	313,243	2.02%	58,909	359,897	1.97%	57,456	359,653	1.91%	56,802	343,508	2.00%	51,692	315,006	1.98%	55,566	338,261	1.98%
Max Month 1	393,586	73,311	347,822	2.56%	69,853	460,128	2.19%	74,061	460,462	2.21%	69,177	401,432	2.34%	63,134	395,064	2.23%			
Max Month 2	375,165	68,259	344,428	2.35%	69,234	416,825	2.11%	71,711	448,961	2.11%	69,046	400,298	2.28%	55,758	380,255	1.92%			
Max Month 3	366,262	53,385	342,868	2.24%	67,663	371,345	2.03%	66,467	407,897	1.97%	58,459	384,480	2.21%	52,745	307,144	2.06%			
Max Mon Avg	378,338	64,985	345,039	2.39%	68,916	416,099	2.11%	70,746	439,107	2.09%	65,561	395,403	2.28%	57,212	360,821	2.07%	65,484	391,294	2.19%
Daily Avg.	19,679.30	3,665.53	17,391		3,493	23,006		3,703	23,023		3,459	20,072		3,157	19,753		3,495	20,649	
Weekly Avg	98,397	18,328	86,956		17,463	115,032		18,515	115,116		17,294	100,358		15,783	98,766		17,477	103,245	

MAX WEEK

	2013	2014			2015			2016			2017			2018				
	gal	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	lbs	gal	solids %	Five-Year Avg	
																	lbs	gal
January	88,930	13,363	79,169	2.02%	13,274	79,767	2.39%	12,295	86,424	2.35%	18,077	94,395	2.56%	14,117	90,660	2.46%		
February	101,433	12,217	78,808	1.86%	13,165	87,073	2.55%	14,571	86,216	2.55%	14,769	79,038	2.68%	12,182	71,570	2.73%		
March	100,862	12,563	75,054	2.01%	15,133	91,993	2.37%	15,438	84,427	2.54%	15,203	73,517	2.69%	12,753	77,041	2.79%		
April	93,426	12,563	75,054	2.01%	15,643	90,089	2.50%	14,928	92,430	2.46%	13,766	74,289	2.66%	12,854	86,605	2.83%		
May	101,991	21,622	121,049	2.14%	15,365	96,738	2.38%	21,942	108,792	2.49%	16,670	91,837	2.79%	15,869	89,008	2.64%		
June	84,897	20,635	94,394	2.62%	21,491	123,945	2.24%	18,302	114,808	2.28%	21,080	103,313	2.59%	24,989	115,067	2.55%		
July	96,934	11,311	83,301	1.63%	13,145	90,643	2.13%	16,968	105,547	2.28%	13,168	86,223	2.32%					
August	60,900	13,687	70,148	2.34%	12,462	90,827	2.08%	16,607	99,443	2.06%	14,592	90,960	2.36%					
September	64,810	14,152	102,388	1.66%	15,482	86,209	1.99%	13,554	87,302	2.06%	18,163	129,253	2.29%					
October	106,170	12,405	79,840	1.86%	18,214	106,822	2.44%	18,330	96,148	2.13%	13,379	97,394	2.51%					
November	75,437	14,716	87,691	2.01%	17,440	108,677	2.29%	13,983	85,558	2.27%	14,185	97,465	2.31%					
December	78,904	13,131	80,159	1.96%	16,806	100,574	2.62%	9,939	66,814	2.10%	14,953	86,665	2.55%					
Max Week	106,170	21,622	121,049		21,491	123,945		21,942	114,808		21,080	129,253		24,989	115,067		**22,225**	**120,824**

MAX DAY

	lbs	gal
2014	8,164	44,898
2015	10,657	55,926
2016	8,891	45,300
2017	7,889	43,752
2018	8,160	50,701
Average	8,752	48,115
MAX DAY	**10,657**	**55,926**

MAX ANNUAL

	lbs	gal
2014	635,644	3,758,915
2015	706,904	4,318,768
2016	689,467	4,315,840
2017	681,627	4,122,093
2018	310,152	1,890,033
Average	678,411	4,128,904
MAX ANNUAL	706,904	4,318,768

West Central Wisconsin
Annual Loading Data

Centrate Summary

2015	Flow Monthly Average *MGD*	BOD Monthly Average *lbs/d*	TSS Monthly Averag *lbs/d*	Total NH3 Monthly Average *lbs/d*	Total P Monthly Average *lbs/d*	Flow Min Day *MGD*	Min Week *MGD*	Min 2-Week *MGD*	Max Day *MGD*	Max Week *MGD*	Max 2-Week *MGD*	
January	0.066	140	106	183	16.8	0.006	0.057	0.060	0.110	0.093	0.083	January
February	0.080	369	163	233	42.8	0.004	0.068	0.073	0.123	0.093	0.085	February
March	0.065	278	133	196	15.7	0.006	0.049	0.053	0.103	0.083	0.081	March
April	0.067	336	238	244	12.0	0.006	0.048	0.054	0.115	0.093	0.083	April
May	0.076	289	141	270	12.7	0.008	0.054	0.056	0.123	0.092	0.085	May
June	0.083	274	158	285	10.4	0.008	0.068	0.075	0.143	0.095	0.089	June
July	0.081	276	184	300	20.0	0.008	0.060	0.069	0.135	0.116	0.102	July
August	0.077	165	122	269	13.4	0.008	0.068	0.073	0.109	0.093	0.086	August
September	0.071	88	141	219	22.0	0.008	0.057	0.063	0.111	0.083	0.082	September
October	0.055	67	53	176	6.6	0.008	0.052	0.053	0.095	0.074	0.073	October
November	0.071	148	47	208	10.2	0.008	0.052	0.053	0.117	0.085	0.076	November
December	0.064	170	98	179	4.6	0.008	0.052	0.062	0.117	0.091	0.077	December
Average Monthly Loading	0.071	216	132	230	15.6	0.007	0.057	0.062	0.117	0.091	0.084	
High/Low Month 1	0.083	369	238	300	42.8	0.004	0.048	0.053	0.143	0.116	0.102	
High/Low Month 2	0.081	336	184	285	22.0	0.006	0.049	0.053	0.135	0.095	0.089	
High/Low Month 3	0.080	289	163	270	20.0	0.006	0.052	0.053	0.123	0.093	0.086	
Average of 3 High/Low Values	0.081	331	195	285	28.3	0.005	0.050	0.053	0.134	0.102	0.092	

	Flow	*Month*
Min Day	0.004	February
Sustained Weekly Min	0.048	April
Sustained 2-Week Min	0.053	March
Max Day	0.143	June
Sustained Weekly Max	0.116	July
Sustained 2-Week Max	0.102	July
Max Month	0.083	June
Annual Average	0.072	N/A

West Central Wisconsin
Annual Loading Data

Centrate Summary

2016	Flow Monthly Average *MGD*	BOD Monthly Average *lbs/d*	TSS Monthly Averag *lbs/d*	Total NH3 Monthly Average *lbs/d*	Total P Monthly Average *lbs/d*	Flow Min Day *MGD*	Min Week *MGD*	Min 2-Week *MGD*	Max Day *MGD*	Max Week *MGD*	Max 2-Week *MGD*	
January	0.069	419	122	201	4.9	0.006	0.057	0.059	0.113	0.089	0.079	January
February	0.081	634	423	245	32.5	0.008	0.057	0.064	0.130	0.096	0.093	February
March	0.073	455	140	243	22.7	0.014	0.049	0.057	0.144	0.094	0.095	March
April	0.068	484	160	220	5.5	0.018	0.047	0.059	0.111	0.087	0.076	April
May												May
June												June
July												July
August												August
September	0.063	63	74	208	1.4	0.008	0.024	0.024	0.109	0.079	0.070	September
October	0.071	241	288	227	3.9	0.008	0.059	0.066	0.117	0.087	0.079	October
November	0.072	317	162	212	3.5	0.008	0.056	0.061	0.100	0.084	0.079	November
December	0.068	335	288	229	5.7	0.015	0.054	0.058	0.098	0.089	0.082	December
Average Monthly Loading	0.071	368	207	223	10.0	0.011	0.050	0.056	0.115	0.088	0.082	
High/Low Month 1	0.081	634	423	245	32.5	0.006	0.024	0.024	0.144	0.096	0.095	
High/Low Month 2	0.073	484	288	243	22.7	0.008	0.047	0.057	0.130	0.094	0.093	
High/Low Month 3	0.072	455	288	229	5.7	0.008	0.049	0.058	0.117	0.089	0.082	
Average of 3 High/Low Values	0.075	524	333	239	20.3	0.007	0.040	0.046	0.130	0.093	0.090	

	Flow	*Month*
Min Day	0.006	January
Sustained Weekly Min	0.024	September
Sustained 2-Week Min	0.024	September
Max Day	0.144	March
Sustained Weekly Max	0.096	February
Sustained 2-Week Max	0.095	March
Max Month	0.081	February
Annual Average	0.072	N/A

West Central Wisconsin
Annual Loading Data

Centrate Summary

2017	Flow Monthly Average *MGD*	BOD Monthly Average *lbs/d*	TSS Monthly Averag *lbs/d*	Total NH3 Monthly Average *lbs/d*	Total P Monthly Average *lbs/d*	Flow Min Day *MGD*	Min Week *MGD*	Min 2-Week *MGD*	Max Day *MGD*	Max Week *MGD*	Max 2-Week *MGD*	
January	0.070	761	412	241	1.6	0.014	0.054	0.060	0.128	0.088	0.081	January
February	0.070	910	794	246	2.7	0.007	0.046	0.059	0.113	0.087	0.081	February
March	0.067	850	494	286	1.9	0.006	0.058	0.063	0.114	0.086	0.081	March
April	0.059	679	316	159	1.1	0.012	0.051	0.055	0.107	0.072	0.068	April
May	0.074	678	290	298	5.9	0.008	0.057	0.062	0.124	0.096	0.082	May
June	0.087	522	334	319	10.9	0.032	0.075	0.081	0.128	0.104	0.099	June
July	0.082	309	350	321	12.3	0.008	N/A	0.056	0.118	N/A	0.101	July
August	0.067	329	163	202	1.1	0.006	0.008	0.057	0.112	0.093	0.083	August
September	0.079	390	194	240	1.3	0.008	N/A	0.065	0.139	N/A	0.089	September
October	0.079	357	109	245	11.2	0.008	0.067	0.070	0.131	0.102	0.085	October
November	0.081	399	198	245	1.3	0.008	0.054	0.068	0.133	0.110	0.095	November
December	0.073	360	179	222	1.2	0.006	0.064	0.070	0.119	0.093	0.098	December
Average Monthly Loading	0.074	545	319	252	4.4	0.010	0.053	0.064	0.122	0.093	0.087	
High/Low Month 1	0.087	910	794	321	12.3	0.006	0.008	0.055	0.139	0.110	0.101	
High/Low Month 2	0.082	850	494	319	11.2	0.006	0.046	0.056	0.133	0.104	0.099	
High/Low Month 3	0.081	761	412	298	10.9	0.006	0.051	0.057	0.131	0.102	0.098	
Average of 3 High/Low Values	0.083	840	567	313	11.4	0.006	0.035	0.056	0.134	0.105	0.099	

	Flow	*Month*
Min Day	0.006	August
Sustained Weekly Min	0.008	August
Sustained 2-Week Min	0.055	April
Max Day	0.139	September
Sustained Weekly Max	0.110	November
Sustained 2-Week Max	0.101	July
Max Month	0.087	June
Annual Average	0.072	NA

West Central Wisconsin
Annual Loading Data

Centrate Summary

2018	Flow Monthly Average *MGD*	BOD Monthly Average *lbs/d*	TSS Monthly Averag *lbs/d*	Total NH3 Monthly Average *lbs/d*	Total P Monthly Average *lbs/d*	Flow Min Day *MGD*	Flow Min Week *MGD*	Flow Min 2-Week *MGD*	Flow Max Day *MGD*	Flow Max Week *MGD*	Flow Max 2-Week *MGD*	
January	0.064	395	74	184	4.1	0.006	0.045	0.053	0.124	0.096	0.083	January
February	0.066	523	113	199	4.0	0.008	0.048	0.051	0.116	0.088	0.077	February
March	0.067	629	155	220	1.4	0.012	N/A	0.057	0.107	N/A	0.077	March
April	0.064	639	129	242	3.0	0.012	0.052	0.058	0.114	0.074	0.074	April
May	0.092	1,113	317	337	4.8	0.014	0.066	0.068	0.148	0.129	0.108	May
June	0.085	1,181	289	277	13.4	0.008	0.068	0.082	0.148	0.112	0.106	June
July	0.080	1,220	185	337	3.6	0.008	0.061	0.069	0.142	0.105	0.088	July
August	0.073	311	168	219	1.4	0.008	0.064	0.070	0.124	0.097	0.081	August
September	0.086	301	138	222	4.4	0.024	0.057	0.062	0.124	0.100	0.098	September
October	0.078	266	34	259	3.4	0.008	0.063	0.072	0.124	0.097	0.093	October
November	0.085	289	37	281	3.6	0.008	0.061	0.067	0.133	0.119	0.106	November
December	0.085	603	288	237	2.9	0.008	0.067	0.069	0.138	0.106	0.099	December
Average Monthly Loading	0.077	622	161	251	4.2	0.010	0.059	0.065	0.129	0.102	0.091	
High/Low Month 1	0.092	1,220	317	337	13.4	0.006	0.045	0.051	0.148	0.129	0.108	
High/Low Month 2	0.086	1,181	289	337	4.8	0.008	0.048	0.053	0.148	0.119	0.106	
High/Low Month 3	0.085	1,113	288	281	4.4	0.008	0.052	0.057	0.142	0.112	0.106	
Average of 3 High/Low Values	0.088	1,171	298	318	7.5	0.007	0.048	0.054	0.146	0.120	0.107	

	Flow	*Month*
Min Day	0.006	January
Sustained Weekly Min	0.045	January
Sustained 2-Week Min	0.051	February
Max Day	0.148	June
Sustained Weekly Max	0.129	May
Sustained 2-Week Max	0.108	May
Max Month	0.092	May
Annual Average	0.072	NA

West Central Wisconsin
Annual Loading Data

Centrate Summary

2019	Flow Monthly Average *MGD*	BOD Monthly Average *lbs/d*	TSS Monthly Average *lbs/d*	Total NH3 Monthly Average *lbs/d*	Total P Monthly Average *lbs/d*	Flow Min Day *MGD*	Min Week *MGD*	Min 2-Week *MGD*	Max Day *MGD*	Max Week *MGD*	Max 2-Week *MGD*	
January	0.070	481	78	296	0.7	0.006	0.046	0.055	0.116	0.108	0.100	January
February	0.069	675	90	242	0.5	0.069	0.045	0.050	0.118	0.089	0.080	February
March	0.078	1,281	108	242	5.6	0.078	0.066	0.070	0.119	0.102	0.091	March
April	0.084	1,083	298	279	1.4	0.084	0.069	0.078	0.125	0.106	0.090	April
May	0.106	1,632	208	419	0.9	0.106	N/A	0.079	0.137	N/A	0.109	May
June												June
July												July
August												August
September												September
October												October
November												November
December												December
Average Monthly Loading	0.081	1,030	157	296	1.8	0.068	0.056	0.066	0.123	0.101	0.094	
High/Low Month 1	0.106	1,632	298	419	5.6	0.006	0.045	0.050	0.137	0.108	0.109	
High/Low Month 2	0.084	1,281	208	296	1.4	0.069	0.046	0.055	0.125	0.106	0.100	
High/Low Month 3	0.078	1,083	108	279	0.9	0.078	0.066	0.070	0.119	0.102	0.091	
Average of 3 High/Low Values	0.089	1,332	205	331	2.6	0.051	0.052	0.058	0.127	0.106	0.100	

	Flow	*Month*
Min Day	0.006	January
Sustained Weekly Min	0.045	February
Sustained 2-Week Min	0.050	February
Max Day	0.137	May
Sustained Weekly Max	0.108	January
Sustained 2-Week Max	0.109	May
Max Month	0.106	May
Annual Average	0.072	NA

	Annual Average					Flow Minimum Values			Flow Maximum Values			
	Flow *MGD*	BOD *lbs/d*	TSS *lbs/d*	NH3 *lbs/d*	Total P *lbs/d*	Min Day *MGD*	Min Week *MGD*	Min 2-Week *MGD*	Max Day *MGD*	Max Week *MGD*	Max 2-Week *MGD*	Max Month *MGD*
2015	0.071	216	132	230	16	0.004	0.048	0.053	0.143	0.116	0.102	0.083
2016	0.071	368	207	223	10	0.006	0.024	0.024	0.144	0.096	0.095	0.081
2017	0.074	545	319	252	4	0.006	0.008	0.055	0.139	0.110	0.101	0.087
2018	0.077	622	161	251	4	0.006	0.045	0.051	0.148	0.129	0.108	0.092
2019	0.081	1030	157	296	2	0.006	0.045	0.050	0.137	0.108	0.109	0.106
Average	0.075	557	195	250	7	0.006	0.034	0.047	0.142	0.112	0.103	0.090
Maximum	0.081	1,030	319	296	16	0.006	0.048	0.055	0.148	0.129	0.109	0.106
Average (3 highest)									**0.145**	**0.118**	**0.106**	**0.095**

	Max Month				
	Flow *MGD*	BOD *lbs/d*	TSS *lbs/d*	Total NH3 *lbs/d*	Total P *lbs/d*
2015	0.083	369	238	300	43
2016	0.081	634	423	245	32
2017	0.087	910	794	321	12
2018	0.092	1220	317	337	13
2019	0.106	1632	298	419	6
Average	**0.090**	**953**	**414**	**324**	**21**
Maximum	**0.106**	**1,632**	**794**	**419**	**43**
Average (3 highest)	**0.095**	**1,254**	**512**	**359**	**30**

West Central Wisconsin Biosolids Facility
Trucks per Day Data

Date	Total Member Loads	Total Non-Member Loads	Total Non-User Loads	Total Loads
1/1/2015				
1/2/2015				
1/3/2015				
1/4/2015				
1/5/2015	11.00	1.00		12.00
1/6/2015	6.00	5.00		11.00
1/7/2015	8.00	4.00		12.00
1/8/2015	7.00	1.00		8.00
1/9/2015	4.00			4.00
1/10/2015	1.00			1.00
1/11/2015	1.00	1.00		2.00
1/12/2015	11.00	1.00		12.00
1/13/2015	9.00	4.00		13.00
1/14/2015	8.00	2.00		10.00
1/15/2015	7.00	1.00		8.00
1/16/2015	1.00	1.00		2.00
1/17/2015				
1/18/2015				
1/19/2015	9.00	1.00		10.00
1/20/2015	7.00	5.00		12.00
1/21/2015	8.00	4.00		12.00
1/22/2015	11.00	1.00		12.00
1/23/2015	2.00			2.00
1/24/2015				
1/25/2015				
1/26/2015	9.00			9.00
1/27/2015	7.00	5.00		12.00
1/28/2015	10.00	2.00		12.00
1/29/2015	10.00	2.00		12.00
1/30/2015	3.00			3.00
1/31/2015				
2/1/2015				
2/2/2015	10.00	1.00		11.00
2/3/2015	9.00	4.00		13.00
2/4/2015	9.00	3.00		12.00
2/5/2015	8.00	1.00		9.00
2/6/2015		1.00		1.00
2/7/2015				
2/8/2015				
2/9/2015	9.00	2.00		11.00
2/10/2015	7.00	5.00		12.00
2/11/2015	11.00	2.00		13.00
2/12/2015	10.00	2.00		12.00
2/13/2015	2.00			2.00
2/14/2015				
2/15/2015				
2/16/2015	11.00			11.00
2/17/2015	7.00	5.00		12.00
2/18/2015	8.00	4.00		12.00
2/19/2015	8.00	2.00		10.00
2/20/2015	1.00	1.00		2.00
2/21/2015				
2/22/2015				
2/23/2015	9.00			9.00
2/24/2015	8.00	4.00		12.00
2/25/2015	9.00	4.00		13.00
2/26/2015	10.00	2.00		12.00
2/27/2015	2.00			2.00
2/28/2015				
3/1/2015				
3/2/2015	9.00	2.00		11.00
3/3/2015	6.00	7.00		13.00
3/4/2015	9.00	3.00		12.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

3/5/2015	11.00	1.00	12.00
3/6/2015	2.00		2.00
3/7/2015			
3/8/2015			
3/9/2015	10.00	2.00	12.00
3/10/2015	10.00	4.00	14.00
3/11/2015	8.00	4.00	12.00
3/12/2015	8.00	2.00	10.00
3/13/2015	4.00		4.00
3/14/2015	1.00		1.00
3/15/2015	2.00		2.00
3/16/2015	9.00	2.00	11.00
3/17/2015	9.00	6.00	15.00
3/18/2015	8.00	3.00	11.00
3/19/2015	11.00	1.00	12.00
3/20/2015			
3/21/2015	4.00	1.00	5.00
3/22/2015	4.00	1.00	5.00
3/23/2015	9.00		9.00
3/24/2015	8.00	6.00	14.00
3/25/2015	6.00	3.00	9.00
3/26/2015	8.00		8.00
3/27/2015	5.00		5.00
3/28/2015			
3/29/2015			
3/30/2015	12.00	1.00	13.00
3/31/2015	9.00	5.00	14.00
4/1/2015	8.00	4.00	12.00
4/2/2015	11.00	1.00	12.00
4/3/2015	3.00		3.00
4/4/2015	1.00		1.00
4/5/2015			
4/6/2015	7.00	2.00	9.00
4/7/2015	10.00	5.00	15.00
4/8/2015	10.00	4.00	14.00
4/9/2015	10.00	2.00	12.00
4/10/2015	8.00		8.00
4/11/2015			
4/12/2015			
4/13/2015	15.00	2.00	17.00
4/14/2015	6.00	6.00	12.00
4/15/2015	11.00	3.00	14.00
4/16/2015	13.00	1.00	14.00
4/17/2015	6.00		6.00
4/18/2015			
4/19/2015	1.00		1.00
4/20/2015	10.00	3.00	13.00
4/21/2015	9.00	5.00	14.00
4/22/2015	8.00	3.00	11.00
4/23/2015	11.00	1.00	12.00
4/24/2015	2.00	1.00	3.00
4/25/2015	2.00		2.00
4/26/2015			
4/27/2015	8.00	2.00	10.00
4/28/2015	9.00	5.00	14.00
4/29/2015	9.00	3.00	12.00
4/30/2015	12.00	1.00	13.00
5/1/2015	1.00		1.00
5/2/2015	3.00	2.00	5.00
5/3/2015			
5/4/2015	8.00	2.00	10.00
5/5/2015	11.00	5.00	16.00
5/6/2015	9.00	3.00	12.00
5/7/2015	10.00	1.00	11.00
5/8/2015	3.00	3.00	6.00
5/9/2015			
5/10/2015			

West Central Wisconsin Biosolids Facility
Trucks per Day Data

5/11/2015	9.00	5.00	14.00
5/12/2015	12.00	5.00	17.00
5/13/2015	11.00	2.00	13.00
5/14/2015	12.00	1.00	13.00
5/15/2015	3.00		3.00
5/16/2015	2.00		2.00
5/17/2015			
5/18/2015	11.00	3.00	14.00
5/19/2015	8.00	5.00	13.00
5/20/2015	9.00	3.00	12.00
5/21/2015	10.00	1.00	11.00
5/22/2015	3.00		3.00
5/23/2015			
5/24/2015			
5/25/2015			
5/26/2015	8.00	5.00	13.00
5/27/2015	12.00	3.00	15.00
5/28/2015	10.00	2.00	12.00
5/29/2015	5.00		5.00
5/30/2015			
5/31/2015			
6/1/2015	9.00	2.00	11.00
6/2/2015	13.00	5.00	18.00
6/3/2015	8.00	4.00	12.00
6/4/2015	10.00	1.00	11.00
6/5/2015	1.00	1.00	2.00
6/6/2015		1.00	1.00
6/7/2015			
6/8/2015	9.00	3.00	12.00
6/9/2015	10.00	4.00	14.00
6/10/2015	8.00	6.00	14.00
6/11/2015	14.00	5.00	19.00
6/12/2015	3.00		3.00
6/13/2015	2.00		2.00
6/14/2015			
6/15/2015	12.00	4.00	16.00
6/16/2015	8.00	5.00	13.00
6/17/2015	10.00	2.00	12.00
6/18/2015	11.00	1.00	12.00
6/19/2015	1.00	1.00	2.00
6/20/2015			
6/21/2015			
6/22/2015	7.00	4.00	11.00
6/23/2015	8.00	4.00	12.00
6/24/2015	9.00	2.00	11.00
6/25/2015	11.00	1.00	12.00
6/26/2015	5.00	2.00	7.00
6/27/2015			
6/28/2015			
6/29/2015	11.00	2.00	13.00
6/30/2015	8.00	6.00	14.00
7/1/2015	11.00	5.00	16.00
7/2/2015	7.00		7.00
7/3/2015			
7/4/2015			
7/5/2015			
7/6/2015	8.00	1.00	9.00
7/7/2015	7.00	5.00	12.00
7/8/2015	14.00	3.00	17.00
7/9/2015	12.00	2.00	14.00
7/10/2015	1.00		1.00
7/11/2015			
7/12/2015			
7/13/2015	11.00	1.00	12.00
7/14/2015	6.00	6.00	12.00
7/15/2015	10.00	2.00	12.00
7/16/2015	10.00	3.00	13.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

7/17/2015	3.00			3.00
7/18/2015				
7/19/2015	2.00			2.00
7/20/2015	10.00	3.00		13.00
7/21/2015	9.00	6.00		15.00
7/22/2015	10.00	2.00		12.00
7/23/2015	9.00	2.00		11.00
7/24/2015	1.00			1.00
7/25/2015				
7/26/2015				
7/27/2015	11.00	1.00		12.00
7/28/2015	8.00	5.00		13.00
7/29/2015	9.00	3.00		12.00
7/30/2015	9.00	3.00		12.00
7/31/2015				
8/1/2015				
8/2/2015				
8/3/2015	8.00	2.00		10.00
8/4/2015	9.00	4.00		13.00
8/5/2015	9.00	3.00		12.00
8/6/2015	9.00	2.00		11.00
8/7/2015	1.00			1.00
8/8/2015				
8/9/2015				
8/10/2015	9.00	1.00		10.00
8/11/2015	10.00	5.00		15.00
8/12/2015	9.00	3.00		12.00
8/13/2015	9.00	1.00		10.00
8/14/2015	2.00			2.00
8/15/2015				
8/16/2015	1.00	1.00		2.00
8/17/2015	10.00	1.00		11.00
8/18/2015	9.00	4.00		13.00
8/19/2015	10.00	2.00		12.00
8/20/2015	9.00	2.00		11.00
8/21/2015				
8/22/2015				
8/23/2015				
8/24/2015	10.00	1.00		11.00
8/25/2015	9.00	4.00	1.00	14.00
8/26/2015	8.00	4.00		12.00
8/27/2015	9.00	2.00		11.00
8/28/2015	1.00			1.00
8/29/2015				
8/30/2015	1.00			1.00
8/31/2015	9.00	2.00		11.00
9/1/2015	9.00	6.00		15.00
9/2/2015	9.00	3.00		12.00
9/3/2015	10.00	2.00		12.00
9/4/2015	2.00			2.00
9/5/2015				
9/6/2015				
9/7/2015	1.00	1.00		2.00
9/8/2015	8.00	5.00		13.00
9/9/2015	11.00	2.00		13.00
9/10/2015	8.00	2.00		10.00
9/11/2015	2.00			2.00
9/12/2015	2.00			2.00
9/13/2015				
9/14/2015	9.00	2.00		11.00
9/15/2015	7.00	5.00		12.00
9/16/2015	12.00	1.00		13.00
9/17/2015	7.00	3.00		10.00
9/18/2015	2.00			2.00
9/19/2015				
9/20/2015				
9/21/2015	9.00	1.00		10.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

9/22/2015	8.00	4.00		12.00
9/23/2015	11.00	1.00		12.00
9/24/2015	8.00	3.00		11.00
9/25/2015		1.00		1.00
9/26/2015				
9/27/2015				
9/28/2015	8.00	2.00		10.00
9/29/2015	8.00	4.00		12.00
9/30/2015	9.00	3.00		12.00
10/1/2015	8.00	3.00		11.00
10/2/2015	2.00			2.00
10/3/2015				
10/4/2015	3.00			3.00
10/5/2015	8.00	2.00		10.00
10/6/2015	9.00	4.00		13.00
10/7/2015	10.00			10.00
10/8/2015	6.00	3.00		9.00
10/9/2015		1.00		1.00
10/10/2015	2.00			2.00
10/11/2015	3.00			3.00
10/12/2015	9.00	2.00		11.00
10/13/2015	6.00	5.00		11.00
10/14/2015	9.00	3.00		12.00
10/15/2015	8.00	2.00		10.00
10/16/2015	2.00			2.00
10/17/2015	4.00			4.00
10/18/2015	3.00			3.00
10/19/2015	7.00	2.00		9.00
10/20/2015	6.00	4.00		10.00
10/21/2015	6.00	6.00		12.00
10/22/2015	7.00	3.00		10.00
10/23/2015	2.00			2.00
10/24/2015	2.00			2.00
10/25/2015	3.00			3.00
10/26/2015	6.00	2.00		8.00
10/27/2015	7.00	4.00		11.00
10/28/2015	8.00	4.00		12.00
10/29/2015	7.00	2.00		9.00
10/30/2015	3.00			3.00
10/31/2015	3.00			3.00
11/1/2015		2.00		2.00
11/2/2015	8.00	2.00		10.00
11/3/2015	7.00	5.00		12.00
11/4/2015	13.00	1.00		14.00
11/5/2015	9.00	2.00		11.00
11/6/2015	1.00			1.00
11/7/2015				
11/8/2015	1.00	1.00		2.00
11/9/2015	10.00	1.00	1.00	12.00
11/10/2015	6.00	8.00		14.00
11/11/2015	9.00	3.00		12.00
11/12/2015	6.00			6.00
11/13/2015	2.00			2.00
11/14/2015				
11/15/2015				
11/16/2015	9.00	1.00		10.00
11/17/2015	8.00	6.00		14.00
11/18/2015	11.00	1.00		12.00
11/19/2015	7.00	4.00		11.00
11/20/2015	3.00			3.00
11/21/2015	4.00			4.00
11/22/2015				
11/23/2015	10.00	2.00		12.00
11/24/2015	8.00	4.00		12.00
11/25/2015	6.00	4.00		10.00
11/26/2015				
11/27/2015				

West Central Wisconsin Biosolids Facility
Trucks per Day Data

11/28/2015				
11/29/2015				
11/30/2015	9.00	4.00		13.00
12/1/2015	6.00	5.00		11.00
12/2/2015	9.00	3.00		12.00
12/3/2015	10.00	2.00		12.00
12/4/2015	1.00	1.00		2.00
12/5/2015				
12/6/2015	1.00			1.00
12/7/2015	11.00	2.00		13.00
12/8/2015	7.00	5.00		12.00
12/9/2015	9.00	3.00		12.00
12/10/2015	9.00	2.00		11.00
12/11/2015	2.00	1.00		3.00
12/12/2015	2.00	1.00		3.00
12/13/2015				
12/14/2015	11.00	3.00		14.00
12/15/2015	5.00	3.00		8.00
12/16/2015	11.00	2.00		13.00
12/17/2015	8.00	3.00		11.00
12/18/2015	2.00			2.00
12/19/2015				
12/20/2015	2.00	1.00		3.00
12/21/2015	9.00	5.00		14.00
12/22/2015	11.00	4.00		15.00
12/23/2015	9.00	2.00		11.00
12/24/2015				
12/25/2015				
12/26/2015	2.00			2.00
12/27/2015	3.00	2.00		5.00
12/28/2015	10.00	2.00		12.00
12/29/2015	8.00	1.00		9.00
12/30/2015	10.00	2.00		12.00
12/31/2015	3.00	3.00		6.00
1/1/2016				
1/2/2016				
1/3/2016	4.00			4.00
1/4/2016	7.00	1.00		8.00
1/5/2016	7.00	6.00		13.00
1/6/2016	8.00	3.00		11.00
1/7/2016	11.00			11.00
1/8/2016	1.00	1.00		2.00
1/9/2016				
1/10/2016				
1/11/2016	11.00	2.00		13.00
1/12/2016	7.00	5.00		12.00
1/13/2016	8.00	4.00		12.00
1/14/2016	10.00			10.00
1/15/2016				
1/16/2016				
1/17/2016				
1/18/2016	10.00			10.00
1/19/2016	8.00	5.00		13.00
1/20/2016	7.00	4.00		11.00
1/21/2016	10.00	1.00		11.00
1/22/2016	1.00			1.00
1/23/2016				
1/24/2016				
1/25/2016	7.00	2.00		9.00
1/26/2016	8.00	4.00		12.00
1/27/2016	10.00	5.00		15.00
1/28/2016	10.00	1.00		11.00
1/29/2016	1.00			1.00
1/30/2016				
1/31/2016				
2/1/2016	11.00	4.00		15.00
2/2/2016	7.00	2.00		9.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

2/3/2016	5.00	3.00	8.00
2/4/2016	9.00	2.00	11.00
2/5/2016	2.00		2.00
2/6/2016			
2/7/2016			
2/8/2016	11.00	2.00	13.00
2/9/2016	8.00	5.00	13.00
2/10/2016	7.00	2.00	9.00
2/11/2016	8.00	2.00	10.00
2/12/2016	2.00		2.00
2/13/2016			
2/14/2016			
2/15/2016	11.00	1.00	12.00
2/16/2016	7.00	4.00	11.00
2/17/2016	7.00	4.00	11.00
2/18/2016	9.00	3.00	12.00
2/19/2016			
2/20/2016			
2/21/2016			
2/22/2016	9.00	2.00	11.00
2/23/2016	8.00	5.00	13.00
2/24/2016	9.00	3.00	12.00
2/25/2016	9.00	2.00	11.00
2/26/2016			
2/27/2016			
2/28/2016			
2/29/2016	10.00	1.00	11.00
3/1/2016	7.00	5.00	12.00
3/2/2016	9.00	3.00	12.00
3/3/2016	9.00	2.00	11.00
3/4/2016	2.00		2.00
3/5/2016			
3/6/2016			
3/7/2016	11.00	3.00	14.00
3/8/2016	11.00	5.00	16.00
3/9/2016	12.00	3.00	15.00
3/10/2016	11.00	2.00	13.00
3/11/2016	2.00		2.00
3/12/2016			
3/13/2016			
3/14/2016	10.00	3.00	13.00
3/15/2016	12.00	4.00	16.00
3/16/2016	11.00	3.00	14.00
3/17/2016	6.00	2.00	8.00
3/18/2016	2.00		2.00
3/19/2016	1.00	2.00	3.00
3/20/2016	2.00		2.00
3/21/2016	11.00	2.00	13.00
3/22/2016	7.00	6.00	13.00
3/23/2016	9.00	4.00	13.00
3/24/2016	7.00		7.00
3/25/2016	4.00		4.00
3/26/2016			
3/27/2016			
3/28/2016	10.00	3.00	13.00
3/29/2016	11.00	4.00	15.00
3/30/2016	11.00	3.00	14.00
3/31/2016	13.00	1.00	14.00
4/1/2016	2.00		2.00
4/2/2016			
4/3/2016	1.00	1.00	2.00
4/4/2016	10.00	3.00	13.00
4/5/2016	10.00	5.00	15.00
4/6/2016	10.00	5.00	15.00
4/7/2016	10.00	1.00	11.00
4/8/2016	4.00		4.00
4/9/2016			

West Central Wisconsin Biosolids Facility
Trucks per Day Data

4/10/2016			
4/11/2016	14.00		14.00
4/12/2016	9.00	5.00	14.00
4/13/2016	10.00	3.00	13.00
4/14/2016	11.00	2.00	13.00
4/15/2016			
4/16/2016			
4/17/2016	1.00	1.00	2.00
4/18/2016	13.00	1.00	14.00
4/19/2016	8.00	5.00	13.00
4/20/2016	9.00	3.00	12.00
4/21/2016	10.00	2.00	12.00
4/22/2016	1.00	1.00	2.00
4/23/2016			
4/24/2016	2.00		2.00
4/25/2016	10.00	2.00	12.00
4/26/2016	7.00	5.00	12.00
4/27/2016	11.00	3.00	14.00
4/28/2016	14.00	2.00	16.00
4/29/2016	2.00		2.00
4/30/2016		1.00	1.00
5/1/2016			
5/2/2016	11.00	3.00	14.00
5/3/2016	9.00	5.00	14.00
5/4/2016	10.00	2.00	12.00
5/5/2016	9.00	3.00	12.00
5/6/2016	4.00	1.00	5.00
5/7/2016			
5/8/2016			
5/9/2016	11.00	2.00	13.00
5/10/2016	9.00	4.00	13.00
5/11/2016	5.00	3.00	8.00
5/12/2016	10.00	2.00	12.00
5/13/2016	8.00	2.00	10.00
5/14/2016			
5/15/2016	3.00	1.00	4.00
5/16/2016	9.00	6.00	15.00
5/17/2016	9.00	5.00	14.00
5/18/2016	9.00	2.00	11.00
5/19/2016	10.00	1.00	11.00
5/20/2016	5.00	1.00	6.00
5/21/2016	3.00		3.00
5/22/2016			
5/23/2016	10.00	2.00	12.00
5/24/2016	12.00	6.00	18.00
5/25/2016	10.00	2.00	12.00
5/26/2016	8.00	3.00	11.00
5/27/2016			
5/28/2016			
5/29/2016			
5/30/2016			
5/31/2016	10.00	4.00	14.00
6/1/2016	7.00	4.00	11.00
6/2/2016	9.00	3.00	12.00
6/3/2016	2.00		2.00
6/4/2016			
6/5/2016			
6/6/2016	9.00	3.00	12.00
6/7/2016	8.00	5.00	13.00
6/8/2016	11.00	4.00	15.00
6/9/2016	10.00	2.00	12.00
6/10/2016	1.00	2.00	3.00
6/11/2016			
6/12/2016	2.00		2.00
6/13/2016	8.00	3.00	11.00
6/14/2016	8.00	5.00	13.00
6/15/2016	9.00	3.00	12.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

6/16/2016	9.00	3.00	12.00
6/17/2016	4.00		4.00
6/18/2016			
6/19/2016			
6/20/2016	12.00	3.00	15.00
6/21/2016	9.00	6.00	15.00
6/22/2016	12.00	3.00	15.00
6/23/2016	8.00	3.00	11.00
6/24/2016	2.00	1.00	3.00
6/25/2016	2.00		2.00
6/26/2016			
6/27/2016	12.00	2.00	14.00
6/28/2016	10.00	6.00	16.00
6/29/2016	8.00	3.00	11.00
6/30/2016	10.00	2.00	12.00
7/1/2016	3.00		3.00
7/2/2016			
7/3/2016			
7/4/2016			
7/5/2016	9.00	4.00	13.00
7/6/2016	10.00	2.00	12.00
7/7/2016	11.00	3.00	14.00
7/8/2016	5.00	1.00	6.00
7/9/2016			
7/10/2016			
7/11/2016	7.00	5.00	12.00
7/12/2016	8.00	5.00	13.00
7/13/2016	11.00	4.00	15.00
7/14/2016	10.00	1.00	11.00
7/15/2016	2.00		2.00
7/16/2016			
7/17/2016			
7/18/2016	10.00	4.00	14.00
7/19/2016	8.00	5.00	13.00
7/20/2016	10.00	3.00	13.00
7/21/2016	10.00		10.00
7/22/2016			
7/23/2016			
7/24/2016			
7/25/2016	8.00	3.00	11.00
7/26/2016	7.00	6.00	13.00
7/27/2016	9.00	3.00	12.00
7/28/2016	11.00	1.00	12.00
7/29/2016		1.00	1.00
7/30/2016			
7/31/2016			
8/1/2016	7.00	3.00	10.00
8/2/2016	8.00	5.00	13.00
8/3/2016	9.00	3.00	12.00
8/4/2016	11.00	1.00	12.00
8/5/2016			
8/6/2016			
8/7/2016			
8/8/2016	7.00	2.00	9.00
8/9/2016	8.00	5.00	13.00
8/10/2016	10.00	2.00	12.00
8/11/2016	10.00		10.00
8/12/2016	3.00	1.00	4.00
8/13/2016			
8/14/2016		1.00	1.00
8/15/2016	9.00	4.00	13.00
8/16/2016	8.00	4.00	12.00
8/17/2016	10.00	3.00	13.00
8/18/2016	6.00	2.00	8.00
8/19/2016	2.00		2.00
8/20/2016			
8/21/2016	1.00		1.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

8/22/2016	8.00	4.00	12.00
8/23/2016	8.00	4.00	12.00
8/24/2016	9.00	4.00	13.00
8/25/2016	8.00	2.00	10.00
8/26/2016			
8/27/2016			
8/28/2016	1.00	1.00	2.00
8/29/2016	9.00	4.00	13.00
8/30/2016	9.00	4.00	13.00
8/31/2016	9.00	3.00	12.00
9/1/2016	10.00	2.00	12.00
9/2/2016			
9/3/2016			
9/4/2016			
9/5/2016			
9/6/2016	8.00	4.00	12.00
9/7/2016	9.00	4.00	13.00
9/8/2016	9.00	2.00	11.00
9/9/2016			
9/10/2016			
9/11/2016			
9/12/2016	9.00	4.00	13.00
9/13/2016	9.00	4.00	13.00
9/14/2016	9.00	3.00	12.00
9/15/2016	9.00	1.00	10.00
9/16/2016	2.00		2.00
9/17/2016	2.00		2.00
9/18/2016			
9/19/2016	8.00	3.00	11.00
9/20/2016	8.00	5.00	13.00
9/21/2016	8.00	3.00	11.00
9/22/2016	12.00	1.00	13.00
9/23/2016	3.00		3.00
9/24/2016			
9/25/2016			
9/26/2016	6.00	3.00	9.00
9/27/2016	8.00	5.00	13.00
9/28/2016	9.00	3.00	12.00
9/29/2016	11.00	1.00	12.00
9/30/2016	2.00		2.00
10/1/2016	2.00		2.00
10/2/2016			
10/3/2016	8.00	4.00	12.00
10/4/2016	8.00	4.00	12.00
10/5/2016	9.00	3.00	12.00
10/6/2016	11.00	1.00	12.00
10/7/2016	2.00		2.00
10/8/2016	2.00	1.00	3.00
10/9/2016			
10/10/2016	6.00	4.00	10.00
10/11/2016	8.00	5.00	13.00
10/12/2016	9.00	3.00	12.00
10/13/2016	11.00	1.00	12.00
10/14/2016	2.00		2.00
10/15/2016	1.00		1.00
10/16/2016			
10/17/2016	6.00	6.00	12.00
10/18/2016	7.00	6.00	13.00
10/19/2016	9.00	2.00	11.00
10/20/2016	11.00	1.00	12.00
10/21/2016	1.00		1.00
10/22/2016			
10/23/2016			
10/24/2016	11.00	1.00	12.00
10/25/2016	8.00	5.00	13.00
10/26/2016	10.00	2.00	12.00
10/27/2016	12.00	1.00	13.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

10/28/2016			
10/29/2016			
10/30/2016			
10/31/2016	9.00	2.00	11.00
11/1/2016	8.00	4.00	12.00
11/2/2016	10.00	3.00	13.00
11/3/2016	12.00	1.00	13.00
11/4/2016	5.00		5.00
11/5/2016			
11/6/2016			
11/7/2016	8.00	2.00	10.00
11/8/2016	8.00	4.00	12.00
11/9/2016	8.00	4.00	12.00
11/10/2016	9.00	1.00	10.00
11/11/2016	1.00	1.00	2.00
11/12/2016			
11/13/2016			
11/14/2016	8.00	1.00	9.00
11/15/2016	7.00	6.00	13.00
11/16/2016	8.00	2.00	10.00
11/17/2016	7.00	2.00	9.00
11/18/2016	7.00		7.00
11/19/2016			
11/20/2016			
11/21/2016	9.00	2.00	11.00
11/22/2016	6.00	5.00	11.00
11/23/2016	7.00	4.00	11.00
11/24/2016			
11/25/2016			
11/26/2016			
11/27/2016			
11/28/2016	8.00	2.00	10.00
11/29/2016	8.00	5.00	13.00
11/30/2016	11.00	1.00	12.00
12/1/2016	9.00	1.00	10.00
12/2/2016			
12/3/2016			
12/4/2016			
12/5/2016	8.00	1.00	9.00
12/6/2016	8.00	5.00	13.00
12/7/2016	10.00	2.00	12.00
12/8/2016	10.00	1.00	11.00
12/9/2016	5.00		5.00
12/10/2016			
12/11/2016			
12/12/2016	9.00	1.00	10.00
12/13/2016	10.00	3.00	13.00
12/14/2016	9.00	2.00	11.00
12/15/2016	7.00	1.00	8.00
12/16/2016			
12/17/2016			
12/18/2016			
12/19/2016	7.00		7.00
12/20/2016	9.00	4.00	13.00
12/21/2016	11.00	1.00	12.00
12/22/2016	10.00	2.00	12.00
12/23/2016			
12/24/2016			
12/25/2016			
12/26/2016			
12/27/2016	10.00	4.00	14.00
12/28/2016	9.00	3.00	12.00
12/29/2016	10.00	1.00	11.00
12/30/2016	2.00		2.00
12/31/2016			
1/1/2017			
1/2/2017			

West Central Wisconsin Biosolids Facility
Trucks per Day Data

1/3/2017	11.00	2.00		13.00
1/4/2017	11.00	3.00		14.00
1/5/2017	12.00	1.00		13.00
1/6/2017	2.00	1.00		3.00
1/7/2017				
1/8/2017				
1/9/2017	8.00	3.00		11.00
1/10/2017	5.00	3.00		8.00
1/11/2017	9.00	3.00		12.00
1/12/2017	11.00	1.00		12.00
1/13/2017	2.00	1.00		3.00
1/14/2017				
1/15/2017				
1/16/2017	6.00	6.00		12.00
1/17/2017	2.00			2.00
1/18/2017	10.00	2.00		12.00
1/19/2017	11.00	4.00		15.00
1/20/2017	10.00			10.00
1/21/2017				
1/22/2017				
1/23/2017	9.00	2.00		11.00
1/24/2017	9.00	4.00		13.00
1/25/2017	8.00	2.00		10.00
1/26/2017	9.00	2.00		11.00
1/27/2017	2.00			2.00
1/28/2017				
1/29/2017				
1/30/2017	9.00	4.00		13.00
1/31/2017	6.00	4.00		10.00
2/1/2017	14.00	2.00		16.00
2/2/2017	10.00	2.00		12.00
2/3/2017				
2/4/2017	2.00	2.00		4.00
2/5/2017				
2/6/2017	9.00	1.00		10.00
2/7/2017	8.00	4.00		12.00
2/8/2017	8.00	2.00		10.00
2/9/2017	8.00	1.00		9.00
2/10/2017	3.00			3.00
2/11/2017				
2/12/2017				
2/13/2017	11.00			11.00
2/14/2017	8.00	5.00		13.00
2/15/2017	10.00	3.00		13.00
2/16/2017	9.00	2.00		11.00
2/17/2017	1.00			1.00
2/18/2017				
2/19/2017				
2/20/2017	11.00	2.00		13.00
2/21/2017	9.00	6.00		15.00
2/22/2017	10.00	3.00		13.00
2/23/2017	9.00	1.00		10.00
2/24/2017				
2/25/2017				
2/26/2017				
2/27/2017	11.00	1.00		12.00
2/28/2017	11.00	4.00		15.00
3/1/2017	11.00	1.00		12.00
3/2/2017	9.00	2.00		11.00
3/3/2017	4.00			4.00
3/4/2017				
3/5/2017				
3/6/2017	12.00	1.00		13.00
3/7/2017	9.00	6.00		15.00
3/8/2017	8.00	3.00		11.00
3/9/2017	11.00	2.00		13.00
3/10/2017				

West Central Wisconsin Biosolids Facility
Trucks per Day Data

3/11/2017	3.00		3.00
3/12/2017			
3/13/2017	12.00		12.00
3/14/2017	8.00	6.00	14.00
3/15/2017	9.00	3.00	12.00
3/16/2017	9.00	2.00	11.00
3/17/2017	1.00		1.00
3/18/2017			
3/19/2017			
3/20/2017	14.00	1.00	15.00
3/21/2017	9.00	5.00	14.00
3/22/2017	11.00	2.00	13.00
3/23/2017	12.00	2.00	14.00
3/24/2017	2.00	1.00	3.00
3/25/2017			
3/26/2017	5.00		5.00
3/27/2017	14.00	2.00	16.00
3/28/2017	8.00	6.00	14.00
3/29/2017	10.00	2.00	12.00
3/30/2017	9.00	2.00	11.00
3/31/2017	3.00		3.00
4/1/2017	1.00		1.00
4/2/2017			
4/3/2017	12.00	2.00	14.00
4/4/2017	10.00	5.00	15.00
4/5/2017	10.00	2.00	12.00
4/6/2017	9.00	2.00	11.00
4/7/2017			
4/8/2017			
4/9/2017			
4/10/2017	10.00	1.00	11.00
4/11/2017	9.00	4.00	13.00
4/12/2017	9.00	3.00	12.00
4/13/2017	10.00	2.00	12.00
4/14/2017	3.00		3.00
4/15/2017			
4/16/2017			
4/17/2017	11.00	3.00	14.00
4/18/2017	9.00	5.00	14.00
4/19/2017	10.00	2.00	12.00
4/20/2017	9.00	2.00	11.00
4/21/2017	1.00		1.00
4/22/2017			
4/23/2017	1.00	1.00	2.00
4/24/2017	8.00	1.00	9.00
4/25/2017	7.00	4.00	11.00
4/26/2017	11.00	2.00	13.00
4/27/2017	9.00	1.00	10.00
4/28/2017	5.00	1.00	6.00
4/29/2017			
4/30/2017	2.00		2.00
5/1/2017	7.00	3.00	10.00
5/2/2017	8.00	6.00	14.00
5/3/2017	7.00	2.00	9.00
5/4/2017	10.00	1.00	11.00
5/5/2017	4.00	1.00	5.00
5/6/2017			
5/7/2017			
5/8/2017	7.00	2.00	9.00
5/9/2017	9.00	3.00	12.00
5/10/2017	11.00	2.00	13.00
5/11/2017	10.00	1.00	11.00
5/12/2017	3.00	1.00	4.00
5/13/2017	1.00	1.00	2.00
5/14/2017	2.00		2.00
5/15/2017	8.00	4.00	12.00
5/16/2017	7.00	3.00	10.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

5/17/2017	11.00	2.00	13.00
5/18/2017	11.00	1.00	12.00
5/19/2017	1.00	2.00	3.00
5/20/2017			
5/21/2017	3.00		3.00
5/22/2017	6.00	4.00	10.00
5/23/2017	8.00	5.00	13.00
5/24/2017	11.00	1.00	12.00
5/25/2017	10.00	2.00	12.00
5/26/2017			
5/27/2017			
5/28/2017			
5/29/2017			
5/30/2017	8.00	5.00	13.00
5/31/2017	11.00	1.00	12.00
6/1/2017	9.00	3.00	12.00
6/2/2017	11.00	2.00	13.00
6/3/2017			
6/4/2017			
6/5/2017	8.00	3.00	11.00
6/6/2017	12.00	4.00	16.00
6/7/2017	10.00	2.00	12.00
6/8/2017	8.00	2.00	10.00
6/9/2017	4.00	5.00	9.00
6/10/2017			
6/11/2017			
6/12/2017	9.00	4.00	13.00
6/13/2017	10.00	3.00	13.00
6/14/2017	10.00	2.00	12.00
6/15/2017	10.00	2.00	12.00
6/16/2017	3.00	1.00	4.00
6/17/2017			
6/18/2017			
6/19/2017	10.00	1.00	11.00
6/20/2017	11.00	5.00	16.00
6/21/2017	9.00	2.00	11.00
6/22/2017	9.00	3.00	12.00
6/23/2017	1.00		1.00
6/24/2017			
6/25/2017			
6/26/2017	8.00	5.00	13.00
6/27/2017	13.00	3.00	16.00
6/28/2017	9.00	4.00	13.00
6/29/2017	9.00	2.00	11.00
6/30/2017	4.00		4.00
7/1/2017			
7/2/2017	3.00	1.00	4.00
7/3/2017			
7/4/2017			
7/5/2017	11.00	5.00	16.00
7/6/2017	13.00	3.00	16.00
7/7/2017	8.00	2.00	10.00
7/8/2017			
7/9/2017			
7/10/2017	9.00	4.00	13.00
7/11/2017	10.00	2.00	12.00
7/12/2017	7.00	4.00	11.00
7/13/2017	9.00	1.00	10.00
7/14/2017			
7/15/2017			
7/16/2017			
7/17/2017	7.00	4.00	11.00
7/18/2017	10.00	3.00	13.00
7/19/2017	8.00	3.00	11.00
7/20/2017	10.00	1.00	11.00
7/21/2017			
7/22/2017			

West Central Wisconsin Biosolids Facility
Trucks per Day Data

7/23/2017			
7/24/2017	9.00	2.00	11.00
7/25/2017	12.00	1.00	13.00
7/26/2017	8.00	3.00	11.00
7/27/2017	9.00	2.00	11.00
7/28/2017	1.00	1.00	2.00
7/29/2017			
7/30/2017			
7/31/2017	9.00	4.00	13.00
8/1/2017	11.00	2.00	13.00
8/2/2017	9.00	3.00	12.00
8/3/2017	8.00	3.00	11.00
8/4/2017			
8/5/2017			
8/6/2017		1.00	1.00
8/7/2017	10.00	2.00	12.00
8/8/2017	11.00	1.00	12.00
8/9/2017	9.00	2.00	11.00
8/10/2017	9.00	3.00	12.00
8/11/2017	1.00		1.00
8/12/2017			
8/13/2017			
8/14/2017	10.00	4.00	14.00
8/15/2017	12.00	1.00	13.00
8/16/2017	7.00	4.00	11.00
8/17/2017	8.00	3.00	11.00
8/18/2017	2.00		2.00
8/19/2017			
8/20/2017		2.00	2.00
8/21/2017	10.00	3.00	13.00
8/22/2017	11.00	1.00	12.00
8/23/2017	8.00	4.00	12.00
8/24/2017	8.00	2.00	10.00
8/25/2017	2.00	1.00	3.00
8/26/2017			
8/27/2017			
8/28/2017	9.00	2.00	11.00
8/29/2017	11.00	2.00	13.00
8/30/2017	7.00	4.00	11.00
8/31/2017	9.00	2.00	11.00
9/1/2017		1.00	1.00
9/2/2017			
9/3/2017			
9/4/2017			
9/5/2017	12.00	4.00	16.00
9/6/2017	9.00	5.00	14.00
9/7/2017	5.00	1.00	6.00
9/8/2017	7.00		7.00
9/9/2017			
9/10/2017			
9/11/2017	9.00	3.00	12.00
9/12/2017	11.00	2.00	13.00
9/13/2017	7.00	4.00	11.00
9/14/2017	9.00	2.00	11.00
9/15/2017			
9/16/2017			
9/17/2017			
9/18/2017	10.00	3.00	13.00
9/19/2017	14.00	2.00	16.00
9/20/2017	9.00	4.00	13.00
9/21/2017	5.00	2.00	7.00
9/22/2017	1.00		1.00
9/23/2017			
9/24/2017			
9/25/2017	8.00	6.00	14.00
9/26/2017	12.00	2.00	14.00
9/27/2017	9.00	4.00	13.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

9/28/2017	9.00	5.00	14.00
9/29/2017	3.00	2.00	5.00
9/30/2017			
10/1/2017			
10/2/2017	8.00	3.00	11.00
10/3/2017	13.00	2.00	15.00
10/4/2017	7.00	4.00	11.00
10/5/2017	8.00	2.00	10.00
10/6/2017	2.00		2.00
10/7/2017			
10/8/2017			
10/9/2017	11.00	3.00	14.00
10/10/2017	11.00	3.00	14.00
10/11/2017	8.00	3.00	11.00
10/12/2017	6.00	2.00	8.00
10/13/2017	3.00		3.00
10/14/2017			
10/15/2017			
10/16/2017	9.00	3.00	12.00
10/17/2017	9.00	4.00	13.00
10/18/2017	7.00	4.00	11.00
10/19/2017	8.00	3.00	11.00
10/20/2017	3.00		3.00
10/21/2017			
10/22/2017			
10/23/2017	8.00	3.00	11.00
10/24/2017	13.00	3.00	16.00
10/25/2017	8.00	4.00	12.00
10/26/2017	10.00	2.00	12.00
10/27/2017			
10/28/2017			
10/29/2017			
10/30/2017	12.00	4.00	16.00
10/31/2017	11.00	2.00	13.00
11/1/2017	5.00	3.00	8.00
11/2/2017	4.00	3.00	7.00
11/3/2017	3.00	1.00	4.00
11/4/2017			
11/5/2017			
11/6/2017	9.00	3.00	12.00
11/7/2017	11.00	3.00	14.00
11/8/2017	6.00	3.00	9.00
11/9/2017	6.00	2.00	8.00
11/10/2017			
11/11/2017			
11/12/2017			
11/13/2017	11.00	4.00	15.00
11/14/2017	12.00	1.00	13.00
11/15/2017	7.00	5.00	12.00
11/16/2017	7.00	3.00	10.00
11/17/2017	2.00		2.00
11/18/2017			
11/19/2017			
11/20/2017	11.00	3.00	14.00
11/21/2017	13.00	3.00	16.00
11/22/2017	10.00	5.00	15.00
11/23/2017			
11/24/2017			
11/25/2017			
11/26/2017			
11/27/2017	7.00	4.00	11.00
11/28/2017	13.00	2.00	15.00
11/29/2017	10.00	5.00	15.00
11/30/2017	13.00	3.00	16.00
12/1/2017	5.00		5.00
12/2/2017			
12/3/2017		1.00	1.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

12/4/2017	11.00	3.00	14.00
12/5/2017	11.00	1.00	12.00
12/6/2017	6.00	5.00	11.00
12/7/2017	9.00	3.00	12.00
12/8/2017	2.00		2.00
12/9/2017			
12/10/2017			
12/11/2017	13.00	3.00	16.00
12/12/2017	13.00	2.00	15.00
12/13/2017	6.00	5.00	11.00
12/14/2017	9.00	2.00	11.00
12/15/2017	3.00		3.00
12/16/2017			
12/17/2017			
12/18/2017	12.00	3.00	15.00
12/19/2017	12.00	1.00	13.00
12/20/2017	11.00	4.00	15.00
12/21/2017	8.00	2.00	10.00
12/22/2017			
12/23/2017			
12/24/2017			
12/25/2017			
12/26/2017	12.00	3.00	15.00
12/27/2017	9.00	5.00	14.00
12/28/2017	12.00	4.00	16.00
12/29/2017	5.00		5.00
12/30/2017			
12/31/2017			
1/1/2018			
1/2/2018	13.00	2.00	15.00
1/3/2018	9.00	5.00	14.00
1/4/2018	8.00	3.00	11.00
1/5/2018	6.00	1.00	7.00
1/6/2018	2.00		2.00
1/7/2018			
1/8/2018	9.00	3.00	12.00
1/9/2018	11.00	2.00	13.00
1/10/2018	6.00	5.00	11.00
1/11/2018	1.00	2.00	3.00
1/12/2018	7.00		7.00
1/13/2018		1.00	1.00
1/14/2018			
1/15/2018	9.00	2.00	11.00
1/16/2018	11.00	2.00	13.00
1/17/2018	8.00	6.00	14.00
1/18/2018	9.00	1.00	10.00
1/19/2018	1.00		1.00
1/20/2018	2.00	2.00	4.00
1/21/2018	2.00	1.00	3.00
1/22/2018			
1/23/2018	7.00		7.00
1/24/2018	6.00	3.00	9.00
1/25/2018	8.00	3.00	11.00
1/26/2018	8.00	2.00	10.00
1/27/2018	2.00		2.00
1/28/2018	2.00		2.00
1/29/2018	7.00	4.00	11.00
1/30/2018	11.00	1.00	12.00
1/31/2018	5.00	3.00	8.00
2/1/2018	6.00	2.00	8.00
2/2/2018	5.00	1.00	6.00
2/3/2018	2.00	1.00	3.00
2/4/2018	2.00		2.00
2/5/2018	5.00	2.00	7.00
2/6/2018	8.00	2.00	10.00
2/7/2018	8.00	4.00	12.00
2/8/2018	9.00	2.00	11.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

2/9/2018	2.00		2.00
2/10/2018			
2/11/2018	3.00		3.00
2/12/2018	8.00	3.00	11.00
2/13/2018	11.00	1.00	12.00
2/14/2018	10.00	3.00	13.00
2/15/2018	8.00	2.00	10.00
2/16/2018			
2/17/2018			
2/18/2018			
2/19/2018	7.00	1.00	8.00
2/20/2018	10.00	2.00	12.00
2/21/2018	10.00	4.00	14.00
2/22/2018	10.00	4.00	14.00
2/23/2018	3.00		3.00
2/24/2018			
2/25/2018			
2/26/2018	11.00	3.00	14.00
2/27/2018	10.00	1.00	11.00
2/28/2018	8.00	1.00	9.00
3/1/2018	7.00	4.00	11.00
3/2/2018	2.00	1.00	3.00
3/3/2018			
3/4/2018	4.00	2.00	6.00
3/5/2018	8.00	2.00	10.00
3/6/2018	7.00	1.00	8.00
3/7/2018	9.00	3.00	12.00
3/8/2018	8.00	3.00	11.00
3/9/2018	5.00		5.00
3/10/2018			
3/11/2018			
3/12/2018	13.00	3.00	16.00
3/13/2018	10.00	1.00	11.00
3/14/2018	9.00	3.00	12.00
3/15/2018	8.00	3.00	11.00
3/16/2018			
3/17/2018			
3/18/2018			
3/19/2018	6.00	3.00	9.00
3/20/2018	15.00	2.00	17.00
3/21/2018	9.00	3.00	12.00
3/22/2018	8.00	3.00	11.00
3/23/2018	3.00		3.00
3/24/2018			
3/25/2018			
3/26/2018	10.00	3.00	13.00
3/27/2018	13.00	1.00	14.00
3/28/2018	8.00	4.00	12.00
3/29/2018	11.00	3.00	14.00
3/30/2018			
3/31/2018			
4/1/2018			
4/2/2018	8.00	4.00	12.00
4/3/2018	8.00		8.00
4/4/2018	9.00	3.00	12.00
4/5/2018	9.00	4.00	13.00
4/6/2018	6.00		6.00
4/7/2018			
4/8/2018	6.00	1.00	7.00
4/9/2018	4.00	2.00	6.00
4/10/2018	15.00	1.00	16.00
4/11/2018	9.00	3.00	12.00
4/12/2018	10.00	2.00	12.00
4/13/2018	1.00		1.00
4/14/2018			
4/15/2018			
4/16/2018	10.00	2.00	12.00

West Central Wisconsin Biosolids Facility
Trucks per Day Data

4/17/2018	13.00	2.00	15.00
4/18/2018	10.00	3.00	13.00
4/19/2018	8.00	2.00	10.00
4/20/2018		1.00	1.00
4/21/2018			
4/22/2018			
4/23/2018	10.00	3.00	13.00
4/24/2018	12.00	1.00	13.00
4/25/2018	9.00	3.00	12.00
4/26/2018	8.00	3.00	11.00
4/27/2018	1.00	1.00	2.00
4/28/2018			
4/29/2018			
4/30/2018	9.00	4.00	13.00
5/1/2018	16.00	2.00	18.00
5/2/2018	8.00	4.00	12.00
5/3/2018	7.00	4.00	11.00
5/4/2018			
5/5/2018			
5/6/2018	4.00	1.00	5.00
5/7/2018	7.00	2.00	9.00
5/8/2018	15.00	4.00	19.00
5/9/2018	10.00	3.00	13.00
5/10/2018	6.00	3.00	9.00
5/11/2018			
5/12/2018			
5/13/2018			
5/14/2018	7.00	3.00	10.00
5/15/2018	16.00	3.00	19.00
5/16/2018	11.00	4.00	15.00
5/17/2018	8.00	3.00	11.00
5/18/2018			
5/19/2018			
5/20/2018		1.00	1.00
5/21/2018	13.00	4.00	17.00
5/22/2018	17.00	1.00	18.00
5/23/2018	12.00	3.00	15.00
5/24/2018	9.00	4.00	13.00
5/25/2018			
5/26/2018			
5/27/2018			
5/28/2018			
5/29/2018	14.00	3.00	17.00
5/30/2018	12.00	3.00	15.00
5/31/2018	11.00	4.00	15.00
6/1/2018	2.00	1.00	3.00
6/2/2018			
6/3/2018		1.00	1.00
6/4/2018	10.00	4.00	14.00
6/5/2018	13.00	3.00	16.00
6/6/2018	8.00	6.00	14.00
6/7/2018	7.00	4.00	11.00
6/8/2018	1.00		1.00
6/9/2018			
6/10/2018			
6/11/2018	9.00	2.00	11.00
6/12/2018	17.00	2.00	19.00
6/13/2018	8.00	7.00	15.00
6/14/2018	10.00	2.00	12.00
6/15/2018			
6/16/2018			
6/17/2018			
6/18/2018	10.00	4.00	14.00
6/19/2018	12.00	3.00	15.00
6/20/2018			
6/21/2018			
6/22/2018			

West Central Wisconsin Biosolids Facility
Trucks per Day Data

6/23/2018				
6/24/2018				
6/25/2018				
6/26/2018				
6/27/2018				
6/28/2018				
6/29/2018				
6/30/2018				

APPENDIX E

Future Loading Projections

West Central Wisconsin Biosolids Facility
2018 Loadings and Projections

		Existing Loadings	Projected Loadings from Existing 2.00% Per Yr Inc		Percent of Projected 2038 Loading
			2028	2038	
Daily					
Sludge	gallons	128,431	156,556	190,841	67.3%
Sludge	pounds	28,112	34,269	41,774	67.3%
Weekly					
Sludge	gallons	439,153	535,325	652,558	67.3%
Sludge	pounds	96,467	117,593	143,345	67.3%
Monthly					
Sludge	gallons	1,730,960	2,110,030	2,572,115	67.3%
Sludge	pounds	357,249	435,484	530,853	67.3%
Annual					
Sludge	gallons	18,851,137	22,979,431	28,011,798	67.3%
Sludge	pounds	3,781,833	4,610,034	5,619,606	67.3%

Existing loading values determined as noted below for 2014 - June 2018:

Daily Average of the three maximum days for 2017 and three maximum days for 2018

Weekly Average of the maximum weeks from 2016, 2017, and 2018

Monthly Refer to Annual Summary Sheet for average of the highest three months for each year evalua

Annual Average of the total gallons and pounds hauled to the facility from 2013 through 2017

*Max lbs is not necessarily the same day as gallons, given the concentration varies daily

2017 Annual percent of total gallons for Members = 78% and Non-Members = 22%

2017 Annual percent of total pounds for Members = 82% and Non-Members = 18%

Centrate Projections - 2% per Year Increase

	Centrate (current)	Centrate (2028)	Centrate (2038)
Daily	142,003	173,100	211,008
Weekly	471,219	574,413	700,206
Monthly	1,913,881	2,333,010	2,843,926
Annual	19,245,879	23,460,620	28,598,364

Current daily is the average of the 3 highest days that occurred from 2015-2019
Current weekly is the average of the 3 highest week totals that occurred from 2015-2019
Current monthly is the average of the 3 highest month totals that occurred from 2015-2019
Current annual is the average of the 3 highest year totals that occurred from 2015-2019

APPENDIX F

Cost Evaluations

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 1 - Upgrades for 2028 Design Loadings

	Description	Qty	Units	PHASE 1 10-Year Projection Unit Cost	Install Factor	Site Const	PHASE 1 10-Year Projection Installed Cost
1.0	**SITE WORK**						
	Erosion Control	1	LS	$10,000	1.00	1.00	$10,000
	Dewatering and Sheeting	1	LS	$25,000	1.00	1.00	$25,000
	Site Piping						
	Pipe #6 - Storage Tank Inlet	1	LS	$11,500	1.00	1.00	$11,500
	Pipe #7 - Storage Tank Discharge	1	LS	$16,300	1.00	2.00	$32,600
	Asphalt Paving	135	SY	$55	1.00	1.00	$7,425
	Concrete Paving	0	SY	$100	1.00	1.00	$0
	Sidewalks	0	SF	$8	1.00	1.00	$0
	Site Grading	1	LS	$7,500	1.00	1.00	$7,500
	Seed, Fertilizer, Mulch	135	SY	$5	1.00	1.00	$675
	Landscaping	1	LS	$2,500	1.00	1.00	$2,500
	Fencing	0	LF	$25	1.00	1.00	$0
	Area Lift Station - 8' diameter	15	VF	$5,000	1.20	1.00	$90,000
	Submersible Pumps	2	EA	$12,000	1.20	1.00	$28,800
	Piping and Valves	1	LS	$25,000	1.20	1.00	$30,000
	Cost Subtotal						**$216,000**
	Electrical			20%			$43,200
Construction Subtotal with Electrical							**$259,200**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 1 - Upgrades for 2028 Design Loadings

Description	Qty	Units	PHASE 1 10-Year Projection Unit Cost	Install Factor	Site Const	PHASE 1 10-Year Projection Installed Cost
1.1 RECEIVING						
Garage Expansion						
Demo existing walls	1	LS	$20,000	1.20	1.00	$24,000
Open north wall	1	LS	$10,000	1.20	1.00	$12,000
Install Center Column	5	CY	$1,150	1.20	1.00	$7,360
Shore Roofing	1	LS	$15,000	1.20	1.00	$18,000
14' Wide Overhead Doors	4	EA	$10,000	1.20	1.00	$48,000
Install Center Support Beam	1	LS	$20,000	1.20	1.00	$24,000
Building Construction						
Excavation	0	CY	$30	1.00	1.00	$0
Rock Excavation	0	CY	$100	1.00	1.00	$0
Structural Fill	0	CY	$25	1.00	1.00	$0
Concrete						
Circular walls	0	CY	$675	1.00	1.00	$0
Straight walls	0	CY	$600	1.00	1.00	$0
Slab on soil	0	CY	$550	1.00	1.00	$0
Shored slab	0	CY	$1,100	1.00	1.00	$0
Shored beams	10	CY	$1,700	1.00	1.00	$17,630
Columns	2	CY	$1,150	1.00	1.00	$2,409
Concrete fill	0	CY	$400	1.00	1.00	$0
Misc concrete	5	CY	$750	1.00	1.00	$3,750
Block walls - split face (single wythe)	0	SF	$30	1.00	1.00	$0
Block walls - split face (multi wythe)	1236	SF	$35	1.00	1.00	$43,256
Block wall - plain	0	SF	$20	1.00	1.00	$0
Concrete plank	1584	SF	$20	1.00	1.00	$31,680
Architectural	1584	SF	$20	1.00	1.00	$31,680
Misc. Metals/Floor Supports	8	EA	$7,500	1.20	1.00	$72,000
Stairs and Railings	0	LF	$100	1.00	1.00	$0
Aluminum Railing	0	LF	$35	1.00	1.00	$0
Concrete Bollards	6	EA	$500	1.00	1.00	$3,000
Equipment						
Truck Scale	1	EA	$100,000	1.20	1.00	$120,000
Truck HVAC	1	LS	$25,000	1.20	1.00	$30,000
Piping and Valves (interior)	0	LS	$0	1.00	1.00	$0
Painting						
Structure Surfaces	0	SF	$8	1.00	1.00	$0
Piping	0	SF	$15	1.00	1.00	$0
Equipment	1	EA	$0	1.00	1.00	$0
HVAC (C1D1/damp)	3168	SF	$50	1.00	1.00	$158,400
HVAC (standard)	0	SF	$30	1.00	1.00	$0
Plumbing (C1D1/damp)	3168	SF	$15	1.00	1.00	$47,520
Plumbing (standard)	0	SF	$10	1.00	1.00	$0
Cost Subtotal						**$694,684**
Electrical			20%			$138,937
Construction Subtotal with Electrical						**$833,621**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 1 - Upgrades for 2028 Design Loadings

Description	Qty	Units	PHASE 1 10-Year Projection Unit Cost	Install Factor	Site Const	PHASE 1 10-Year Projection Installed Cost
1.2 SCREENING						
Demolition						
Concrete Core 8"	4	EA	$1,500	1.00	1.00	$6,000
Wall Core 4"	1	EA	$1,500	1.00	1.00	$1,500
Building Construction						$0
Excavation	0	CY	$30	1.00	1.00	$0
Rock Excavation	0	CY	$100	1.00	1.00	$0
Structural Fill	0	CY	$25	1.00	1.00	$0
Concrete						
Circular walls	0	CY	$675	1.00	1.00	$0
Straight walls	0	CY	$600	1.00	1.00	$0
Slab on soil	0	CY	$550	1.00	1.00	$0
Shored slab	0	CY	$1,100	1.00	1.00	$0
Shored beams	0	CY	$1,700	1.00	1.00	$0
Columns	0	CY	$1,150	1.00	1.00	$0
Concrete fill	0	CY	$400	1.00	1.00	$0
Misc concrete	9	CY	$750	1.00	1.00	$6,750
Block walls - split face (single wythe)	0	SF	$30	1.00	1.00	$0
Block walls - split face (multi wythe)	715	SF	$35	1.00	1.00	$25,025
Block wall - plain	0	SF	$20	1.00	1.00	$0
Concrete plank	0	SF	$20	1.00	1.00	$0
Roofing	715	SF	$20	1.00	1.00	$14,300
Architectural	715	SF	$20	1.00	1.00	$14,300
Misc. Metals/Floor Supports	6	EA	$10,000	1.20	1.00	$72,000
Stairs and Railings	0	LF	$100	1.00	1.00	$0
Aluminum Railing	0	LF	$35	1.00	1.00	$0
Equipment						
Screen	1	EA	$175,000	1.20	1.00	$210,000
Piping and Valves (interior)						
Truck Discharge to Screen Piping	1	LS	$12,820	1.00	1.00	$12,820
Screen Discharge to Tank Piping	1	LS	$17,625	1.00	1.00	$17,625
Painting						
Structure Surfaces	1150	SF	$8	1.00	1.00	$9,200
Piping	153	SF	$15	1.00	1.00	$2,301
Equipment	1	EA	$0	1.00	1.00	$0
HVAC (C1D1/damp)	715	SF	$50	1.00	1.00	$35,750
HVAC (standard)	0	SF	$30	1.00	1.00	$0
Plumbing (C1D1/damp)	715	SF	$15	1.00	1.00	$10,725
Plumbing (standard)	0	SF	$10	1.00	1.00	$0
Cost Subtotal						**$438,296**
Electrical			25%			$109,574
Construction Subtotal with Electrical						**$547,870**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 1 - Upgrades for 2028 Design Loadings

Description	Qty	Units	PHASE 1 10-Year Projection Unit Cost	Install Factor	Site Const	PHASE 1 10-Year Projection Installed Cost
1.3 SLUDGE TANKS						
Demolition						
Concrete Cores	5	EA	$1,500	1.00	1.00	$7,500
Existing Odor Control Piping	1	LS	$5,000	1.00	2.00	$10,000
Building Construction						
Excavation	0	CY	$30	1.00	1.00	$0
Rock Excavation	0	CY	$100	1.00	1.00	$0
Structural Fill	0	CY	$25	1.00	1.00	$0
Concrete						
Circular walls	0	CY	$675	1.00	1.00	$0
Straight walls	0	CY	$600	1.00	1.00	$0
Slab on soil	0	CY	$550	1.00	1.00	$0
Shored slab	0	CY	$1,100	1.00	1.00	$0
Shored beams	0	CY	$1,700	1.00	1.00	$0
Columns	0	CY	$1,150	1.00	1.00	$0
Concrete fill	152	CY	$400	1.00	1.00	$60,694
Misc concrete	0	CY	$750	1.00	1.00	$0
Block walls - split face (single wythe)	0	SF	$30	1.00	1.00	$0
Block walls - split face (multi wythe)	0	SF	$35	1.00	1.00	$0
Block wall - plain	0	SF	$20	1.00	1.00	$0
Concrete plank	0	SF	$20	1.00	1.00	$0
Roofing	0	SF	$20	1.00	1.00	$0
Architectural	0	SF	$20	1.00	1.00	$0
Misc. Metals	0	LS	$20	1.00	1.00	$0
Access Hatches	4	EA	$2,500	1.20	2.00	$24,000
Stairs and Railings	0	LF	$100	1.00	1.00	$0
Aluminum Railing	0	LF	$35	1.00	1.00	$0
Equipment						
Sludge Mixing Pump	2	EA	$20,000	1.20	1.00	$48,000
Piping and Valves (interior)						
New Sludge Mixing Piping	1	LS	$52,000	1.20	1.00	$62,400
Modify Intake Piping	1	LS	$16,500	1.20	1.00	$19,800
New Odor Control Piping	1	LS	$10,200	1.20	1.00	$12,240
Modify Floor Drain Destinations	1	LS	$16,200	1.20	1.00	$19,440
Painting						
Structure Surfaces	0	SF	$8	1.00	1.00	$0
Piping	173	SF	$15	1.00	1.00	$2,592
Equipment	2	EA	$0	1.00	1.00	$0
HVAC (C1D1/damp)	0	SF	$50	1.00	1.00	$0
HVAC (standard)	0	SF	$30	1.00	1.00	$0
Plumbing (C1D1/damp)	0	SF	$15	1.00	1.00	$0
Plumbing (standard)	0	SF	$10	1.00	1.00	$0
Cost Subtotal						**$266,666**
Electrical			20%			$53,333
Construction Subtotal with Electrical						**$319,999**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 1 - Upgrades for 2028 Design Loadings

Description	Qty	Units	PHASE 1 10-Year Projection Unit Cost	Install Factor	Site Const	PHASE 1 10-Year Projection Installed Cost
1.4 CENTRATE STORAGE TANK						
Building Construction						
Excavation	4663	CY	$30	1.00	1.00	$139,895
Rock Excavation	0	CY	$100	1.00	1.00	$0
Structural Fill	177	CY	$25	1.00	1.00	$4,424
Concrete						
Circular walls	231	CY	$675	1.00	1.00	$156,216
Straight walls	0	CY	$600	1.00	1.00	$0
Slab on soil	268	CY	$550	1.00	1.00	$147,445
Shored slab	0	CY	$1,100	1.00	1.00	$0
Shored beams	0	CY	$1,700	1.00	1.00	$0
Columns	0	CY	$1,150	1.00	1.00	$0
Concrete fill	0	CY	$400	1.00	1.00	$0
Misc concrete	0	CY	$750	1.00	1.00	$0
Block walls - split face (single wythe)	0	SF	$30	1.00	1.00	$0
Block walls - split face (multi wythe)	0	SF	$35	1.00	1.00	$0
Block wall - plain	0	SF	$20	1.00	1.00	$0
Concrete plank	0	SF	$20	1.00	1.00	$0
Roofing	0	SF	$20	1.00	1.00	$0
Architectural	0	SF	$20	1.00	1.00	$0
Misc. Metals	0	LS	$20	1.00	1.00	$0
Stairs and Railings	245	LF	$100	1.00	1.00	$24,504
BioFilter Construction						
Excavation	453	CY	$30	1.00	1.00	$13,596
Structural Fill	253	CY	$25	1.00	1.00	$6,333
Retaining Wall	816	SF	$20	1.00	1.00	$16,320
Mulch	253	CY	$30	1.00	1.00	$7,600
Equipment						
Mixing Equipment	4	EA	$15,000	1.20	1.00	$72,000
Tank Cover	2	EA	$75,000	1.20	1.00	$180,000
Submersible Pumps	4	EA	$15,000	1.20	1.00	$72,000
Odor Control Blower	1	EA	$15,000	1.20	1.00	$18,000
Piping and Valves (Centrate)	1	LS	$60,000	1.20	1.00	$72,000
Piping and Valves (Odor)	1	LS	$33,000	1.20	1.00	$39,600
Painting						
Structure Surfaces	0	SF	$8	1.00	1.00	$0
Piping	0	SF	$15	1.00	1.00	$0
Equipment	4	EA	$0	1.00	1.00	$0
HVAC (C1D1/damp)	0	SF	$50	1.00	1.00	$0
HVAC (standard)	0	SF	$30	1.00	1.00	$0
Plumbing (C1D1/damp)	0	SF	$15	1.00	1.00	$0
Plumbing (standard)	0	SF	$10	1.00	1.00	$0
Cost Subtotal						**$969,934**
Electrical			25%			$242,483
Construction Subtotal with Electrical						**$1,212,417**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 1 - Upgrades for 2028 Design Loadings

Description	Qty	Units	PHASE 1 10-Year Projection Unit Cost	Install Factor	Site Const	PHASE 1 10-Year Projection Installed Cost
1.5 CHEMICAL FEED BUILDING						
Building Construction						
Excavation	192	CY	$30	1.00	1.00	$5,768
Rock Excavation	0	CY	$100	1.00	1.00	$0
Structural Fill	24	CY	$25	1.00	1.00	$611
Concrete						
Circular walls	0	CY	$675	1.00	1.00	$0
Straight walls	27	CY	$600	1.00	1.00	$16,000
Slab on soil	46	CY	$550	1.00	1.00	$25,080
Shored slab	0	CY	$1,100	1.00	1.00	$0
Shored beams	0	CY	$1,700	1.00	1.00	$0
Columns	0	CY	$1,150	1.00	1.00	$0
Concrete fill	0	CY	$400	1.00	1.00	$0
Misc concrete	0	CY	$750	1.00	1.00	$0
Block walls - split face (single wythe)	0	SF	$30	1.00	1.00	$0
Block walls - split face (multi wythe)	1720	SF	$35	1.00	1.00	$60,200
Block wall - plain	400	SF	$20	1.00	1.00	$8,000
Concrete plank	1320	SF	$20	1.00	1.00	$26,400
Roofing	1320	SF	$20	1.00	1.00	$26,400
Architectural	1320	SF	$20	1.00	1.00	$26,400
Misc. Metals	0	LS	$20	1.00	1.00	$0
Stairs and Railings	66	LF	$100	1.00	1.00	$6,600
Equipment						
Chemical Pumps	6	EA	$4,000	1.20	1.00	$28,800
Chemical Tanks	6	EA	$3,500	1.20	1.00	$25,200
Piping and Valves						
Chemical Headers	3	LS	$7,500	1.20	1.00	$27,000
Water service to building	1	LS	$19,450	1.20	1.00	$23,340
Carrier pipe to ex building	3	LS	$12,250	1.20	1.00	$44,100
Painting						
Structure Surfaces	3040	SF	$8	1.00	1.00	$24,320
Piping	0	SF	$15	1.00	1.00	$0
Equipment	6	EA	$0	1.00	1.00	$0
HVAC (C1D1/damp)	1320	SF	$50	1.00	1.00	$66,000
HVAC (standard)	0	SF	$30	1.00	1.00	$0
Plumbing (C1D1/damp)	1320	SF	$15	1.00	1.00	$19,800
Plumbing (standard)	0	SF	$10	1.00	1.00	$0
Cost Subtotal						**$460,019**
Electrical			20%			$92,003.82
Construction Subtotal with Electrical						**$552,023**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 1 - Upgrades for 2028 Design Loadings

Description	Qty	Units	PHASE 1 10-Year Projection Unit Cost	Install Factor	Site Const	PHASE 1 10-Year Projection Installed Cost
Phase 1 Upgrades Capital Cost Summary						
						Construction Subtotals with Electrical
1.0 Site Work						**$259,200**
1.1 Sludge Receiving						**$833,621**
1.2 Sludge Screening						**$547,870**
1.3 Sludge Holding Tanks						**$319,999**
1.4 Centrate Storage Tanks						**$1,212,417**
1.5 Chemical Feed Building						**$552,023**
Construction Subtotal						**$3,725,131**
Additional Contractor Costs			9%			$335,262
Total Construction Cost						**$4,060,393**
Additional Design and Management Costs						
Contingencies			10%			$406,039
Engineering, Admin, Legal			14%			$568,455
Resident Engineering			3%			$121,812
Cost Subtotal						**$1,096,306**
Total Phase 1 Capital Estimate						**$5,156,699**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 2 - Upgrades for 2038 Design Loadings

Description	Qty	Units	PHASE 2 20-Year Projection Unit Cost	Install Factor	Site Const.	PHASE 2 20-Year Projection Installed Cost
2.0 CENTRIFUGE UNITS						
Demolition						
Remove Existing Centrifuge Units	1	LS	$25,000	1.00	1.00	$25,000
Building Construction						
Excavation	0	CY	$30	1.00	1.00	$0
Rock Excavation	0	CY	$100	1.00	1.00	$0
Structural Fill	0	CY	$25	1.00	1.00	$0
Concrete						
Circular walls	0	CY	$675	1.00	1.00	$0
Straight walls	0	CY	$600	1.00	1.00	$0
Slab on soil	0	CY	$550	1.00	1.00	$0
Shored slab	9	CY	$1,100	1.00	1.00	$9,979
Shored beams	0	CY	$1,700	1.00	1.00	$0
Columns	5	CY	$1,150	1.00	1.00	$5,620
Concrete fill	0	CY	$400	1.00	1.00	$0
Misc concrete	0	CY	$750	1.00	1.00	$0
Block walls - split face (single wythe)	0	SF	$30	1.00	1.00	$0
Block walls - split face (multi wythe)	0	SF	$35	1.00	1.00	$0
Block wall - plain	0	SF	$20	1.00	1.00	$0
Architectural	240	SF	$20	1.00	1.00	$4,800
Misc. Metals	1	LS	$10,000	1.00	1.00	$10,000
Stairs and Railings	10	LF	$100	1.00	1.00	$1,000
Aluminum Railing	46	LF	$35	1.00	1.00	$1,622
Equipment						
Larger Centrifuge Units	1	EA	$543,900	1.15	1.00	$625,485
New Polymer Skid	1	EA	$15,000	1.15	1.00	$17,250
Conveyor Modifications	1	LS	$40,000	1.15	1.00	$46,000
Piping and Valves (interior)	1	LS	$25,000	1.00	1.00	$25,000
Diversion Piping	1	LS	$27,000	1.00	1.10	$29,700
Painting						
Structure Surfaces	0	SF	$8	1.00	1.00	$0
Piping	0	SF	$15	1.00	1.00	$0
Equipment	1	EA	$0	1.00	1.00	$0
HVAC (C1D1/damp)	1632	SF	$50	1.00	1.00	$81,600
HVAC (standard)	0	SF	$30	1.00	1.00	$0
Plumbing (C1D1/damp)	0	SF	$15	1.00	1.00	$0
Plumbing (standard)	0	SF	$10	1.00	1.00	$0
Cost Subtotal						**$883,056**
Electrical			20%			$176,611
Construction Subtotal with Electrical						**$1,059,667**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 2 - Upgrades for 2038 Design Loadings

Description	Qty	Units	PHASE 2 20-Year Projection Unit Cost	Install Factor	Site Const.	PHASE 2 20-Year Projection Installed Cost
2.1 PUMPING						
Demolition						
Demo 4" Piping	1	LS	$10,000	1.00	1.00	$10,000
Concrete Core (6")	1	EA	$1,500	1.00	1.00	$1,500
Concrete Core (12")	3	EA	$1,500	1.00	1.00	$4,500
Remove Concrete for feed piping	1	LS	$15,000	1.00	1.00	$15,000
Building Construction						
Excavation	0	CY	$30	1.00	1.00	$0
Rock Excavation	0	CY	$100	1.00	1.00	$0
Structural Fill	0	CY	$25	1.00	1.00	$0
Concrete						
Circular walls	0	CY	$675	1.00	1.00	$0
Straight walls	0	CY	$600	1.00	1.00	$0
Slab on soil	0	CY	$550	1.00	1.00	$0
Shored slab	0	CY	$1,100	1.00	1.00	$0
Shored beams	0	CY	$1,700	1.00	1.00	$0
Columns	0	CY	$1,150	1.00	1.00	$0
Concrete fill	7	CY	$400	1.00	1.50	$4,444
Misc concrete	2	CY	$750	1.00	1.50	$2,250
Block walls - split face (single wythe)	0	SF	$30	1.00	1.00	$0
Block walls - split face (multi wythe)	0	SF	$35	1.00	1.00	$0
Block wall - plain	0	SF	$20	1.00	1.00	$0
Concrete plank	0	SF	$20	1.00	1.00	$0
Roofing	0	SF	$20	1.00	1.00	$0
Architectural	200	SF	$20	1.00	1.50	$6,000
Misc. Metals	0	LS	$20	1.00	1.00	$0
Stairs and Railings	0	LF	$100	1.00	1.00	$0
Aluminum Railing	0	LF	$35	1.00	1.00	$0
Equipment						
Sludge Pumps	3	EA	$20,000	1.20	1.00	$72,000
Piping and Valves (interior)						
New pump suction (6")	1	LS	$1,000	1.00	1.10	$1,100
Pumping Discharge Header (8")	1	LS	$58,000	1.00	1.10	$63,800
Centrate to storage (12")	1	LS	$10,140	1.00	1.10	$11,154
Centrate from storage (6")	1	LS	$7,500	1.00	1.10	$8,250
Painting						
Structure Surfaces	0	SF	$8	1.00	1.00	$0
Piping	465	SF	$15	1.00	1.00	$6,974
Equipment	3	EA	$0	1.00	1.00	$0
HVAC (C1D1/damp)	1387	SF	$50	1.00	1.00	$69,330
HVAC (standard)	0	SF	$30	1.00	1.00	$0
Plumbing (C1D1/damp)	1387	SF	$15	1.00	1.00	$20,799
Plumbing (standard)	0	SF	$10	1.00	1.00	$0
Cost Subtotal						**$297,102**
Electrical			40%			$118,841
Construction Subtotal with Electrical						**$415,942**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 2 - Upgrades for 2038 Design Loadings

Description	Qty	Units	PHASE 2 20-Year Projection Unit Cost	Install Factor	Site Const.	PHASE 2 20-Year Projection Installed Cost
2.2 ADDITIONAL STORAGE AREA						
Site Work						
Erosion Control	1	LS	$10,000	1.00	1.00	$10,000
Asphalt Paving	535	SY	$55	1.00	1.00	$29,425
Concrete Paving	0	SY	$100	1.00	1.00	$0
Sidewalks	800	SF	$8	1.00	1.00	$6,400
Site Grading	1	LS	$20,000	1.00	1.00	$20,000
Seed, Fertilizer, Mulch	0	SY	$5	1.00	1.00	$0
Landscaping	0	SF	$10	1.00	1.00	$0
Fencing	1300	LF	$25	1.00	1.00	$32,500
Cost Subtotal						**$98,325**
Building Construction						
Excavation	0	CY	$30	1.00	1.00	$0
Rock Excavation	0	CY	$100	1.00	1.00	$0
Structural Fill	0	CY	$25	1.00	1.00	$0
Concrete						
Circular walls	0	CY	$675	1.00	1.00	$0
Straight walls	89	CY	$600	1.00	1.00	$53,667
Slab on soil	139	CY	$550	1.00	1.00	$76,389
Shored slab	0	CY	$1,100	1.00	1.00	$0
Shored beams	0	CY	$1,700	1.00	1.00	$0
Columns	0	CY	$1,150	1.00	1.00	$0
Concrete fill	0	CY	$400	1.00	1.00	$0
Misc concrete	0	CY	$750	1.00	1.00	$0
Block walls - split face (single wythe)	0	SF	$30	1.00	1.00	$0
Block walls - split face (multi wythe)	0	SF	$35	1.00	1.00	$0
Block wall - plain	0	SF	$20	1.00	1.00	$0
Metal Building	3000	SF	$60	1.00	1.00	$180,000
Concrete plank	0	SF	$20	1.00	1.00	$0
Roofing	0	SF	$20	1.00	1.00	$0
Architectural	3000	SF	$20	1.00	1.00	$60,000
Misc. Metals	0	LS	$20	1.00	1.00	$0
Stairs and Railings	0	LF	$100	1.00	1.00	$0
Aluminum Railing	0	LF	$35	1.00	1.00	$0
Equipment						
Wall Curtains	1	LS		1.20	1.00	$0
Odor Control	1	LS		1.20	1.00	$0
Piping and Valves						
Drains to Area Lift Station	1	EA	$24,500	1.20	1.00	$29,400
Water Service to Building	1	EA	$23,500	1.20	1.00	$28,200
Painting						
Structure Surfaces	0	SF	$8	1.00	1.00	$0
Piping	0	SF	$15	1.00	1.00	$0
Equipment	1	EA	$0	1.00	1.00	$0
HVAC (C1D1/damp)	0	SF	$50	1.00	1.00	$0
HVAC (standard)	0	SF	$30	1.00	1.00	$0
Plumbing (C1D1/damp)	3000	SF	$15	1.00	1.00	$45,000
Plumbing (standard)	0	SF	$10	1.00	1.00	$0
Cost Subtotal						**$669,306**
Electrical			20%			$133,861
Construction Subtotal with Electrical						**$901,492**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Phase 2 - Upgrades for 2038 Design Loadings

Description	Qty	Units	PHASE 2 20-Year Projection Unit Cost	Install Factor	Site Const.	PHASE 2 20-Year Projection Installed Cost
Phase 2 Upgrades Capital Cost Summary						
						Construction Subtotals with Electrical
2.0 Centrifuge Upgrades						**$1,059,667**
2.1 Sludge Pumping Upgrades						**$415,942**
2.2 Additional Storage Area						**$901,492**
Construction Subtotal						**$2,377,101**
Additional Contractor Costs			9%			$213,939
Total Construction Cost						**$2,591,040**
Additional Design and Management Costs						
Contingencies			10%			$259,104
Engineering, Admin, Legal			14%			$362,746
Resident Engineering			3%			$77,731
Cost Subtotal						**$699,581**
Total Phase 2 Project Cost						**$3,290,621**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option A

Add to any additional costs for Option A

							PHASE 1 =	**$5,156,699**	
							PHASE 2 =		**$3,290,621**
	Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**
A.1	**Lime Stabilization Equipment**								
	Demolition								
	Remove Existing Power Unit	1	LS	$0	$10,000	1.00	1.00	$0	$10,000
	Equipment								
	60 HP Power Unit	1	LS	$0	$82,000	1.20	1.00	$0	$98,400
	Piping and Valves (interior)	0	LS	$0	$0	1.00	1.00	$0	$0
	Painting								
	Structure Surfaces	0	SF	$8	$8	1.00	1.00	$0	$0
	Piping	0	SF	$15	$15	1.00	1.00	$0	$0
	Equipment	0	EA			1.00	1.00	$0	$0
	HVAC (C1D1/damp)	1000	SF	$50	$0	1.00	1.00	$50,000	$0
	HVAC (standard)	0	SF	$30	$30	1.00	1.00	$0	$0
	Plumbing (C1D1/damp)	0	SF	$15	$15	1.00	1.00	$0	$0
	Plumbing (standard)	0	SF	$10	$10	1.00	1.00	$0	$0
	Cost Subtotal							**$50,000**	**$108,400**
	Odor Control Equipment								
	Demolition								
	Remove Existing Chemical Scrubber	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
	Equipment								
	Bohn Biofilter	1	LS	$650,000	$281,532	1.20	1.00	$780,000	$337,838
	Ionization Unit (15,000 cfm)	1	LS	$318,356	$137,888	1.20	1.00	$382,027	$165,465
	Construction								
	Excavation	1111	CY	$30	$0	1.00	1.00	$33,333	$0
	Concrete	57	CY	$600	$0	1.00	1.00	$34,444	$0
	Concrete - Ionization/GAC	39	CY	$600	$259.88	1.00	1.00	$23,698	$10,264
	Excavation (Phase 2)	139	CY	$0	$30	1.00	1.00	$0	$4,167
	Concrete (Phase 2)	20	CY	$0	$600	1.00	1.00	$0	$12,222
	Accessories								
	Inside Ductwork	3715	SF	$50	$0	1.00	1.00	$185,725	$0
	Ductwork to Blower	75	LF	$100	$0	1.00	1.00	$7,500	$0
	6" Drain	150	LF	$70	$0	1.00	1.00	$10,500	$0
	Water - Irrigation	150	LF	$65	$0	1.00	1.00	$9,750	$0
	Inside Ductwork (Phase 2)	300	SF	$0	$50	1.00	1.00	$0	$15,000
	Ductwork to Blower (Phase 2)	50	LF	$0	$100	1.00	1.00	$0	$5,000
	6" Drain (Phase 2)	50	LF	$0	$70	1.00	1.00	$0	$3,500
	Water - Irrigation (Phase 2)	50	LF	$0	$65	1.00	1.00	$0	$3,250
	Cost Subtotal							**$1,516,977**	**$556,706**
Construction Subtotal								**$1,566,977**	**$665,106**
	Electrical			20%	20%			$313,395	$133,021
Construction Subtotal with Electrical								**$1,880,373**	**$798,128**
	Additional Contractor Costs			9%	9%			$169,234	$71,831
Total Construction Cost								**$2,049,606**	**$869,959**
Additional Design and Management Costs									
	Contingencies			10%	10%			$204,961	$86,996
	Engineering, Admin, Legal			14%	14%			$286,945	$121,794
	Resident Engineering			3%	3%			$61,488	$26,099
	Cost Subtotal							**$553,394**	**$234,889**
Total Project Cost								**$2,603,000**	**$1,104,848**
Total Option A Project Costs								**$7,759,699**	**$4,395,469**
							Sum:	**$12,155,168**	

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West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option B

Add to any additional costs for Option B

PHASE 1 =	**$5,156,699**
PHASE 2 =	**$2,389,130**

Description	Qty	Units	10-Year Projection Unit Cost	20-Year Projection Unit Cost	Install Factor	Site Const.	10-Year Projection Installed Cost	20-Year Projection Installed Cost
B.1 DRYER ROOM								
Demolition								
Wall Core	2	EA	$1,500	$0	1.00	1.00	$3,000	$0
Sawcutting	446	LF	$25.00	$0	1.00	1.00	$11,150	$0
Demo Existing floor	12012	SF	$2.50	$0	1.00	1.00	$30,030	$0
Building Construction								
Excavation	1582	CY	$30	$0	1.00	1.00	$47,466	$0
Rock Excavation	0	CY	$100	$0	1.00	1.00	$0	$0
Structural Fill	206	CY	$25	$0	1.00	1.00	$5,156	$0
Concrete								
Circular walls	0	CY	$675	$0	1.00	1.00	$0	$0
Straight walls (Foundation)	85	CY	$600	$0	1.00	1.00	$50,963	$0
Slab on soil	460	CY	$550	$0	1.00	1.00	$253,122	$0
Shored slab	0	CY	$1,100	$0	1.00	1.00	$0	$0
Shored beams	0	CY	$1,700	$0	1.00	1.00	$0	$0
Columns	26	CY	$1,150	$0	1.00	1.00	$29,438	$0
Concrete fill	0	CY	$400	$0	1.00	1.00	$0	$0
Misc concrete	10.0	CY	$750	$0	1.00	1.00	$7,500	$0
Block walls - split face (single wythe)	0	SF	$30	$0	1.00	1.00	$0	$0
Block walls - split face (multi wythe)	7546	SF	$35	$0	1.00	1.00	$264,110	$0
Block wall - plain	0	SF	$20	$0	1.00	1.00	$0	$0
Concrete plank	11136	SF	$20	$0	1.00	1.00	$222,720	$0
Architectural	11136	SF	$20	$0	1.00	1.00	$222,720	$0
Overhead Doors	2	EA	$10,000	$0	1.20	1.00	$24,000	$0
Misc. Metals	0	LS	$20	$0	1.00	1.00	$0	$0
Stairs and Railings	0	LF	$100	$0	1.00	1.00	$0	$0
Aluminum Railing	0	LF	$35	$0	1.00	1.00	$0	$0
Equipment								
1040 U Gryphon Dryer (2 included in LS	1	LS	$3,141,300	$300,700	1.20	1.00	$3,769,560	$360,840
Conveyor	1	LS	$149,750	$51,000	1.20	1.00	$179,700	$61,200
Piping and Valves (interior)								
Sludge Dryer Feed Piping	1	LS	$128,200	$0	1.00	1.00	$128,200	$0
Wash Water Suction	1	LS	$15,000	$0	1.00	1.00	$15,000	$0
Wash Water Discharge	1	LS	$21,200	$0	1.00	1.00	$21,200	$0
Condensate Drain	1	LS	$22,500	$0	1.20	1.00	$27,000	$0
Painting								
Structure Surfaces	20596	SF	$8	$0	1.00	1.00	$164,768	$0
Piping	1864	SF	$15	$0	1.00	1.00	$27,960	$0
Equipment	2	EA	$0	$0	1.00	1.00	$0	$0
New Natural Gas Service	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
HVAC (C1D1/damp)	11136	SF	$50	$0	1.00	1.00	$556,800	$0
HVAC (standard)	0	SF	$30	$0	1.00	1.00	$0	$0
Plumbing (C1D1/damp)	11136	SF	$15	$0	1.00	1.00	$167,040	$0
Plumbing (standard)	0	SF	$10	$0	1.00	1.00	$0	$0
Cost Subtotal							**$6,278,602**	**$422,040**
B.2 Lime Stabilization Equipment								
Demolition								
Remove Existing Power Unit	1	LS	$0	$10,000	1.00	1.00	$0	$10,000
Equipment								
60 HP Power Unit	1	LS	$0	$82,000	1.20	1.00	$0	$98,400
Piping and Valves (interior)	0	LS	$0	$0	1.00	1.00	$0	$0
Painting								
Structure Surfaces	0	SF	$8	$8	1.00	1.00	$0	$0
Piping	0	SF	$15	$15	1.00	1.00	$0	$0
Equipment	0	EA			1.00	1.00	$0	$0
HVAC (C1D1/damp)	1000	SF	$50	$50	1.00	1.00	$50,000	$50,000
HVAC (standard)	0	SF	$30	$30	1.00	1.00	$0	$0
Plumbing (C1D1/damp)	0	SF	$15	$15	1.00	1.00	$0	$0
Plumbing (standard)	0	SF	$10	$10	1.00	1.00	$0	$0
Cost Subtotal							**$50,000**	**$158,400**
Odor Control Equipment								

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option B

Add to any additional costs for Option B

PHASE 1 =	**$5,156,699**
PHASE 2 =	**$2,389,130**

Description	Qty	Units	10-Year Projection Unit Cost	20-Year Projection Unit Cost	Install Factor	Site Const.	10-Year Projection Installed Cost	20-Year Projection Installed Cost
Demolition								
Remove Existing Chemical Scrubber	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
Equipment								
Bohn Biofilter	1	LS	$639,715	$0	1.20	1.00	$767,658	$0
Ionization Unit (15,000 cfm)	1	LS	$318,356	$0	1.20	1.00	$382,027	$0
Construction								
Excavation	1394	CY	$30	$0	1.00	1.00	$41,811	$0
Concrete	65	CY	$600	$0	1.00	1.00	$38,889	$0
Concrete-Ionization/GAC	39	CY	$600	$0	1.00	1.00	$23,698	$0
Accessories								
Inside Ductwork	3715	SF	$50	$0	1.00	1.00	$185,725	$0
Ductwork to Blower	75	LF	$100	$0	1.00	1.00	$7,500	$0
6" Drain	150	LF	$70	$0	1.00	1.00	$10,500	$0
Water - Irrigation	150	LF	$65	$0	1.00	1.00	$9,750	$0
Cost Subtotal							**$1,517,557**	**$0**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option B

Add to any additional costs for Option B

							PHASE 1 =	**$5,156,699**	
							PHASE 2 =		**$2,389,130**
Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**		20-Year Projection **Installed Cost**
Construction Subtotal							**$7,846,160**		**$580,440**
Electrical			30%	30%			$2,353,848		$174,132
Construction Subtotal with Electrical							**$10,200,008**		**$754,572**
Additional Contractor Costs			9%	9%			$918,001		$67,911
Total Construction Cost							**$11,118,008**		**$822,483**
Additional Design and Management Costs									
Contingencies			10%	10%			$1,111,801		$82,248
Engineering, Admin, Legal			14%	14%			$1,556,521		$115,148
Resident Engineering			3%	3%			$333,540		$24,675
Cost Subtotal							**$3,001,862**		**$222,071**
Total Project Cost							**$14,119,871**		**$1,044,554**
Total Option B Project Costs							**$19,276,569**		**$3,433,684**
						Sum:	**$22,710,253**		

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option B - 24/7 Drying Full Load

Add to any additional costs for Option B

								PHASE 1 =	**$5,156,699**	
								PHASE 2 =		**$2,389,130**
	Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**	
B.1	**DRYER ROOM**									
	Demolition									
	Wall Core	2	EA	$1,500	$0	1.00	1.00	$3,000	$0	
	Sawcutting	364	LF	$25.00	$0	1.00	1.00	$9,100	$0	
	Demo Existing floor	7344	SF	$2.50	$0	1.00	1.00	$18,360	$0	
	Building Construction									
	Excavation	1107	CY	$30	$0	1.00	1.00	$33,207	$0	
	Rock Excavation	0	CY	$100	$0	1.00	1.00	$0	$0	
	Structural Fill	109	CY	$25	$0	1.00	1.00	$2,726	$0	
	Concrete									
	Circular walls	0	CY	$675	$0	1.00	1.00	$0	$0	
	Straight walls (Foundation)	69	CY	$600	$0	1.00	1.00	$41,244	$0	
	Slab on soil	257	CY	$550	$0	1.00	1.00	$141,207	$0	
	Shored slab	0	CY	$1,100	$0	1.00	1.00	$0	$0	
	Shored beams	0	CY	$1,700	$0	1.00	1.00	$0	$0	
	Columns	26	CY	$1,150	$0	1.00	1.00	$29,438	$0	
	Concrete fill	0	CY	$400	$0	1.00	1.00	$0	$0	
	Misc concrete	10	CY	$750	$0	1.00	1.00	$7,500	$0	
	Block walls - split face (single wythe)	0	SF	$30	$0	1.00	1.00	$0	$0	
	Block walls - split face (multi wythe)	6644	SF	$35	$0	1.00	1.00	$232,540	$0	
	Block wall - plain	0	SF	$20	$0	1.00	1.00	$0	$0	
	Concrete plank	5888	SF	$20	$0	1.00	1.00	$117,760	$0	
	Architectural	5888	SF	$20	$0	1.00	1.00	$117,760	$0	
	Overhead Doors	2	EA	$10,000	$0	1.20	1.00	$24,000	$0	
	Misc. Metals	0	LS	$20	$0	1.00	1.00	$0	$0	
	Stairs and Railings	0	LF	$100	$0	1.00	1.00	$0	$0	
	Aluminum Railing	0	LF	$35	$0	1.00	1.00	$0	$0	
	Equipment									
	1050 U Gryphon Dryer	1	LS	$2,038,056	$0	1.20	1.00	$2,445,667	$0	
	Conveyor	1	LS	$120,000	$0	1.20	1.00	$144,000	$0	
	Piping and Valves (interior)									
	Sludge Dryer Feed Piping	1	LS	$128,200	$0	1.00	1.00	$128,200	$0	
	Wash Water Suction	1	LS	$15,000	$0	1.00	1.00	$15,000	$0	
	Wash Water Discharge	1	LS	$21,200	$0	1.00	1.00	$21,200	$0	
	Condensate Drain	1	LS	$22,500	$0	1.20	1.00	$27,000	$0	
	Painting									
	Structure Surfaces	13544	SF	$8	$0	1.00	1.00	$108,352	$0	
	Piping	1864	SF	$15	$0	1.00	1.00	$27,960	$0	
	Equipment	2	EA	$0	$0	1.00	1.00	$0	$0	
	New Natural Gas Service	1	LS	$50,000	$0	1.00	1.00	$50,000	$0	
	HVAC (C1D1/damp)	5888	SF	$50	$0	1.00	1.00	$294,400	$0	
	HVAC (standard)	0	SF	$30	$0	1.00	1.00	$0	$0	
	Plumbing (C1D1/damp)	5888	SF	$15	$0	1.00	1.00	$88,320	$0	
	Plumbing (standard)	0	SF	$10	$0	1.00	1.00	$0	$0	
	Cost Subtotal							**$4,127,942**	**$0**	
B.2	**Lime Stabilization Equipment**									
	Demolition									
	Remove Existing Power Unit	1	LS	$0	$10,000	1.00	1.00	$0	$10,000	
	Equipment									
	60 HP Power Unit	1	LS	$0	$82,000	1.20	1.00	$0	$98,400	
	Piping and Valves (interior)	0	LS	$0	$0	1.00	1.00	$0	$0	
	Painting									
	Structure Surfaces	0	SF	$8	$8	1.00	1.00	$0	$0	
	Piping	0	SF	$15	$15	1.00	1.00	$0	$0	
	Equipment	0	EA			1.00	1.00	$0	$0	
	HVAC (C1D1/damp)	1000	SF	$50	$50	1.00	1.00	$50,000	$50,000	
	HVAC (standard)	0	SF	$30	$30	1.00	1.00	$0	$0	
	Plumbing (C1D1/damp)	0	SF	$15	$15	1.00	1.00	$0	$0	
	Plumbing (standard)	0	SF	$10	$10	1.00	1.00	$0	$0	
	Cost Subtotal							**$50,000**	**$158,400**	
	Odor Control Equipment									

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option B - 24/7 Drying Full Load

Add to any additional costs for Option B

							PHASE 1 =	**$5,156,699**
							PHASE 2 =	**$2,389,130**
Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**
Demolition								
Remove Existing Chemical Scrubber	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
Equipment								
Bohn Biofilter	1	LS	$716,263	$0	1.20	1.00	$859,516	$0
Ionization Unit (15,000 cfm)	1	LS	$318,356	$0	1.20	1.00	$382,027	$0
Construction								
Excavation	1561	CY	$30	$0	1.00	1.00	$46,817	$0
Concrete	68	CY	$600	$0	1.00	1.00	$40,889	$0
Concrete-Ionization/GAC	39	CY	$600	$0	1.00	1.00	$23,698	$0
Accessories								
Inside Ductwork	3715	SF	$50	$0	1.00	1.00	$185,725	$0
Ductwork to Blower	75	LF	$100	$0	1.00	1.00	$7,500	$0
6" Drain	150	LF	$70	$0	1.00	1.00	$10,500	$0
Water - Irrigation	150	LF	$65	$0	1.00	1.00	$9,750	$0
Cost Subtotal							**$1,616,421**	**$0**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option B - 24/7 Drying Full Load

Add to any additional costs for Option B

							PHASE 1 =	**$5,156,699**	
							PHASE 2 =		**$2,389,130**
Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**	
Construction Subtotal							**$5,794,362**	**$158,400**	
Electrical			30%	30%			$1,738,309	$47,520	
Construction Subtotal with Electrical							**$7,532,671**	**$205,920**	
Additional Contractor Costs			9%	9%			$677,940	$18,533	
Total Construction Cost							**$8,210,611**	**$224,453**	
Additional Design and Management Costs									
Contingencies			10%	10%			$821,061	$22,445	
Engineering, Admin, Legal			14%	14%			$1,149,486	$31,423	
Resident Engineering			3%	3%			$246,318	$6,734	
Cost Subtotal							**$2,216,865**	**$60,602**	
Total Project Cost							**$10,427,476**	**$285,055**	
Total Option B Project Costs							**$15,584,175**	**$2,674,185**	
						Sum:	**$18,258,360**		

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option C

Add to any additional costs for Option C

PHASE 1 =	**$5,156,699**
PHASE 2 =	**$2,389,130**

	Description	Qty	Units	10-Year Projection Unit Cost	20-Year Projection Unit Cost	Install Factor	Site Const.	10-Year Projection Installed Cost	20-Year Projection Installed Cost
C.1	**BIOSET**								
	Demolition								
	Demo Lime System Equipment	1	LS	$25,000	$0	1.00	1.00	$25,000	$0
	Wall Core	1	EA	$1,500	$0	1.00	1.00	$1,500	$0
	Equipment								
	Process Equipment Item	0	EA	$0	0.00	1.00	1.00	$0	$0
	Piping and Valves (interior)								
	Lime System Bypass Piping	1	LS	$28,200	0.00	1.00	1.00	$28,200	$0
	Painting				0.00		1.00		
	Structure Surfaces	0	SF	$8	0.00	1.00	1.00	$0	$0
	Piping	408	SF	$15	0.00	1.00	1.00	$6,126	$0
	Equipment	0	EA	$0	0.00	1.00	1.00	$0	$0
	HVAC (C1D1/damp)	0	SF	$50	0.00	1.00	1.00	$0	$0
	HVAC (standard)	0	SF	$30	0.00	1.00	1.00	$0	$0
	Plumbing (C1D1/damp)	0	SF	$15	0.00	1.00	1.00	$0	$0
	Plumbing (standard)	0	SF	$10	0.00	1.00	1.00	$0	$0
	Cost Subtotal							**$60,826**	**$0**
C.2	**DRYER ROOM**								
	Demolition								
	Wall Core	2	EA	$1,500	$0	1.00	1.00	$3,000	$0
	Wall Penetration for Conveyor	1	EA	$7,500	$0	1.20	1.00	$9,000	$0
	Sawcutting	446	LF	$2.50	$0	1.00	1.00	$1,115	$0
	Demo Existing Floor	12012	SF	$2.50	$0	1.00	1.00	$30,030	$0
	Building Construction								
	Excavation	1582	CY	$30	$0	1.00	1.00	$47,466	$0
	Rock Excavation	0	CY	$100	$0	1.00	1.00	$0	$0
	Structural Fill	206	CY	$25	$0	1.00	1.00	$5,156	$0
	Concrete								
	Circular walls	0	CY	$675	$0	1.00	1.00	$0	$0
	Straight walls	85	CY	$600	$0	1.00	1.00	$50,963	$0
	Slab on soil	460	CY	$550	$0	1.00	1.00	$253,122	$0
	Shored slab	0	CY	$1,100	$0	1.00	1.00	$0	$0
	Shored beams	0	CY	$1,700	$0	1.00	1.00	$0	$0
	Columns	26	CY	$1,150	$0	1.00	1.00	$29,438	$0
	Concrete fill	0	CY	$400	$0	1.00	1.00	$0	$0
	Misc concrete	10.0	CY	$750	$0	1.00	1.00	$7,500	$0
	Block walls - split face (single wythe)	0	SF	$30	$0	1.00	1.00	$0	$0
	Block walls - split face (multi wythe)	7546	SF	$35	$0	1.00	1.00	$264,110	$0
	Block wall - plain	0	SF	$20	$0	1.00	1.00	$0	$0
	Concrete plank	11136	SF	$20	$0	1.00	1.00	$222,720	$0
	Architectural	11136	SF	$20	$0	1.00	1.00	$222,720	$0
	Overhead Doors	2	EA	$10,000	$0	1.20	1.00	$24,000	$0
	Misc. Metals	0	LS	$20	$0	1.00	1.00	$0	$0
	Stairs and Railings	0	LF	$100	$0	1.00	1.00	$0	$0
	Aluminum Railing	0	LF	$35	$0	1.00	1.00	$0	$0

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option C

Add to any additional costs for Option C

							PHASE 1 =	**$5,156,699**
							PHASE 2 =	**$2,389,130**
Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**
Equipment								
Dewatered Product Conveyor	2	EA	$120,000	$0	1.20	1.00	$288,000	$0
1060 U Gryphon Dryer (2 included in LS	1	LS	$4,000,000	$1,000,000	1.00	1.00	$4,000,000	$1,000,000
Dried Product Conveyor	1	LS	$149,750	$51,000	1.20	1.00	$179,700	$61,200
Dry Product Storage								
Equalization Silo	1	LS	$200,000	$0	1.20	1.00	$240,000	$0
4-cell bagging system/scales	1	LS	$103,040	$0	1.20	1.00	$123,648	$0
Screw conveyor	1	LS	$100,000	$0	1.20	1.00	$120,000	$0
Rotary Valves	4	EA	$15,000	$0	1.20	1.00	$72,000	$0
Piping and Valves (interior)								
Sludge Dryer Feed Piping	1	LS	$128,200	$0	1.00	1.00	$128,200	$0
Wash Water Suction	1	LS	$15,000	$0	1.00	1.00	$15,000	$0
Wash Water Discharge	1	LS	$21,200	$0	1.00	1.00	$21,200	$0
Condensate Drain	1	LS	$22,500	$0	1.00	1.00	$22,500	$0
Painting								
Structure Surfaces	20596	SF	$8	$0	1.00	1.00	$164,768	$0
Piping	2168	SF	$15	$0	1.00	1.00	$32,515	$0
Equipment	2	EA	$0	$0	1.00	1.00	$0	$0
New Natural Gas Service	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
HVAC (C1D1/damp)	11136	SF	$50	$0	1.00	1.00	$556,800	$0
HVAC (standard)	0	SF	$30	$0	1.00	1.00	$0	$0
Plumbing (C1D1/damp)	11136	SF	$15	$0	1.00	1.00	$167,040	$0
Plumbing (standard)	0	SF	$10	$0	1.00	1.00	$0	$0
Cost Subtotal							**$7,351,711**	**$1,061,200**
Odor Control Equipment								
Demolition								
Remove Existing Chemical Scrubber	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
Equipment								
Bohn Biofilter	1	LS	$51,000	$0	1.20	1.00	$61,200	$0
Construction								
Excavation	111	CY	$30	$0	1.00	1.00	$3,333	$0
Concrete	19	CY	$600	$0	1.00	1.00	$11,111	$0
Accessories								
Inside Ductwork	3715	SF	$50	$0	1.00	1.00	$185,725	$0
Ductwork to Blower	75	LF	$100	$0	1.00	1.00	$7,500	$0
6" Drain	150	LF	$70	$0	1.00	1.00	$10,500	$0
Water - Irrigation	150	LF	$65	$0	1.00	1.00	$9,750	$0
Cost Subtotal							**$339,119**	**$0**
Construction Subtotal							**$7,751,656**	**$1,061,200**
Electrical			10%	25%			$775,166	$265,300
Construction Subtotal with Electrical							**$8,526,822**	**$1,326,500**
Additional Contractor Costs			9%	9%			$767,414	$119,385
Total Construction Cost							**$9,294,236**	**$1,445,885**
Additional Design and Management Costs								
Contingencies			10%	10%			$929,424	$144,589
Engineering, Admin, Legal			15%	15%			$1,394,135	$216,883
Resident Engineering			3%	3%			$278,827	$43,377
Cost Subtotal							**$2,602,386**	**$404,848**
Total Project Cost							**$11,896,622**	**$1,850,733**
Total OF ALL PROCESSES Project Cost							**$17,053,320**	**$4,239,862**
							Sum:	**$21,293,183**

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West Central Biosolids Facility
Facilities Plan
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11/7/2019
Option C

Add to any additional costs for Option C

PHASE 1 =	**$5,156,699**
PHASE 2 =	**$2,389,130**

	Description	Qty	Units	10-Year Projection Unit Cost	20-Year Projection Unit Cost	Install Factor	Site Const.	10-Year Projection Installed Cost	20-Year Projection Installed Cost
C.1	**BIOSET**								
	Demolition								
	Demo Lime System Equipment	1	LS	$25,000	$0	1.00	1.00	$25,000	$0
	Wall Core	1	EA	$1,500	$0	1.00	1.00	$1,500	$0
	Equipment								
	Process Equipment Item	0	EA	$0	0.00	1.00	1.00	$0	$0
	Piping and Valves (interior)								
	Lime System Bypass Piping	1	LS	$28,200	0.00	1.00	1.00	$28,200	$0
	Painting				0.00		1.00		
	Structure Surfaces	0	SF	$8	0.00	1.00	1.00	$0	$0
	Piping	408	SF	$15	0.00	1.00	1.00	$6,126	$0
	Equipment	0	EA	$0	0.00	1.00	1.00	$0	$0
	HVAC (C1D1/damp)	0	SF	$50	0.00	1.00	1.00	$0	$0
	HVAC (standard)	0	SF	$30	0.00	1.00	1.00	$0	$0
	Plumbing (C1D1/damp)	0	SF	$15	0.00	1.00	1.00	$0	$0
	Plumbing (standard)	0	SF	$10	0.00	1.00	1.00	$0	$0
	Cost Subtotal							**$60,826**	**$0**
C.2	**DRYER ROOM**								
	Demolition								
	Wall Core	2	EA	$1,500	$0	1.00	1.00	$3,000	$0
	Wall Penetration for Conveyor	1	EA	$7,500	$0	1.20	1.00	$9,000	$0
	Sawcutting	446	LF	$2.50	$0	1.00	1.00	$1,115	$0
	Demo Existing Floor	12012	SF	$2.50	$0	1.00	1.00	$30,030	$0
	Building Construction								
	Excavation	1582	CY	$30	$0	1.00	1.00	$47,466	$0
	Rock Excavation	0	CY	$100	$0	1.00	1.00	$0	$0
	Structural Fill	206	CY	$25	$0	1.00	1.00	$5,156	$0
	Concrete								
	Circular walls	0	CY	$675	$0	1.00	1.00	$0	$0
	Straight walls	85	CY	$600	$0	1.00	1.00	$50,963	$0
	Slab on soil	460	CY	$550	$0	1.00	1.00	$253,122	$0
	Shored slab	0	CY	$1,100	$0	1.00	1.00	$0	$0
	Shored beams	0	CY	$1,700	$0	1.00	1.00	$0	$0
	Columns	26	CY	$1,150	$0	1.00	1.00	$29,438	$0
	Concrete fill	0	CY	$400	$0	1.00	1.00	$0	$0
	Misc concrete	10.0	CY	$750	$0	1.00	1.00	$7,500	$0
	Block walls - split face (single wythe)	0	SF	$30	$0	1.00	1.00	$0	$0
	Block walls - split face (multi wythe)	7546	SF	$35	$0	1.00	1.00	$264,110	$0
	Block wall - plain	0	SF	$20	$0	1.00	1.00	$0	$0
	Concrete plank	11136	SF	$20	$0	1.00	1.00	$222,720	$0
	Architectural	11136	SF	$20	$0	1.00	1.00	$222,720	$0
	Overhead Doors	2	EA	$10,000	$0	1.20	1.00	$24,000	$0
	Misc. Metals	0	LS	$20	$0	1.00	1.00	$0	$0
	Stairs and Railings	0	LF	$100	$0	1.00	1.00	$0	$0
	Aluminum Railing	0	LF	$35	$0	1.00	1.00	$0	$0

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option C

Add to any additional costs for Option C

							PHASE 1 =	**$5,156,699**	
							PHASE 2 =		**$2,389,130**
Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**
Equipment								
Dewatered Product Conveyor	2	EA	$120,000	$0	1.20	1.00	$288,000	$0
1060 U Gryphon Dryer (2 included in LS	1	LS	$4,000,000	$1,000,000	1.00	1.00	$4,000,000	$1,000,000
Dried Product Conveyor	1	LS	$149,750	$51,000	1.20	1.00	$179,700	$61,200
Dry Product Storage								
Dry Product Silos	2	EA	$240,000	$0	1.35	1.00	$648,000	$0
Pnuematic Conveyor	2	EA	$120,000	$0	1.20	1.00	$288,000	$0
Discharge Bin Activator	2	LS	$25,000	$0	1.20	1.00	$60,000	$0
Discharge Conveyor	1	EA	$75,000	$0	1.20	1.00	$90,000	$0
Nitrogen Purge System	2	EA	$50,000	$0	1.20	1.00	$120,000	$0
Controls Enclosure	1	EA	$20,000	$0	1.20	1.00	$24,000	$0
Loadout Shed	1500	SF	$250	$0	1.20	1.00	$450,000	$0
Excavation	961	CY	$30	$0	1.00	1.00	$28,830	$0
Structural Fill	160	CY	$25	$0	1.00	1.00	$4,004	$0
Concrete Foundations/Footings	320	CY	$600	$0	1.00	1.00	$192,200	$0
Site Work	1	LS	$40,000	$0	1.20	1.00	$48,000	$0
Piping and Valves (interior)								
Sludge Dryer Feed Piping	1	LS	$128,200	$0	1.00	1.00	$128,200	$0
Wash Water Suction	1	LS	$15,000	$0	1.00	1.00	$15,000	$0
Wash Water Discharge	1	LS	$21,200	$0	1.00	1.00	$21,200	$0
Condensate Drain	1	LS	$22,500	$0	1.00	1.00	$22,500	$0
Painting								
Structure Surfaces	20596	SF	$8	$0	1.00	1.00	$164,768	$0
Piping	2168	SF	$15	$0	1.00	1.00	$32,515	$0
Equipment	2	EA	$0	$0	1.00	1.00	$0	$0
New Natural Gas Service	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
HVAC (C1D1/damp)	11136	SF	$50	$0	1.00	1.00	$556,800	$0
HVAC (standard)	0	SF	$30	$0	1.00	1.00	$0	$0
Plumbing (C1D1/damp)	11136	SF	$15	$0	1.00	1.00	$167,040	$0
Plumbing (standard)	0	SF	$10	$0	1.00	1.00	$0	$0
Cost Subtotal							**$8,749,097**	**$1,061,200**
Odor Control Equipment								
Demolition								
Remove Existing Chemical Scrubber	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
Equipment								
Bohn Biofilter	1	LS	$51,000	$0	1.20	1.00	$61,200	$0
Construction								
Excavation	111	CY	$30	$0	1.00	1.00	$3,333	$0
Concrete	19	CY	$600	$0	1.00	1.00	$11,111	$0
Accessories								
Inside Ductwork	3715	SF	$50	$0	1.00	1.00	$185,725	$0
Ductwork to Blower	75	LF	$100	$0	1.00	1.00	$7,500	$0
6" Drain	150	LF	$70	$0	1.00	1.00	$10,500	$0
Water - Irrigation	150	LF	$65	$0	1.00	1.00	$9,750	$0
Cost Subtotal							**$339,119**	**$0**
Construction Subtotal							**$9,149,042**	**$1,061,200**
Electrical			10%	25%			$914,904	$265,300
Construction Subtotal with Electrical							**$10,063,947**	**$1,326,500**
Additional Contractor Costs			9%	9%			$905,755	$119,385
Total Construction Cost							**$10,969,702**	**$1,445,885**
Additional Design and Management Costs								
Contingencies			10%	10%			$1,096,970	$144,589
Engineering, Admin, Legal			15%	15%			$1,645,455	$216,883
Resident Engineering			3%	3%			$329,091	$43,377
Cost Subtotal							**$3,071,517**	**$404,848**
Total Project Cost							**$14,041,218**	**$1,850,733**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option C

Add to any additional costs for Option C

							PHASE 1 =	**$5,156,699**
							PHASE 2 =	**$2,389,130**
Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**
Total OF ALL PROCESSES Project Cost							**$19,197,917**	**$4,239,862**
						Sum:	**$23,437,779**	

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option C - Full Load Drying 24 hr, 4 day per week

Add to any additional costs for Option C

							PHASE 1 =	**$5,156,699**	
							PHASE 2 =		**$2,389,130**
	Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**
C.1	**BIOSET**								
	Demolition								
	Demo Lime System Equipment	1	LS	$25,000	$0	1.00	1.00	$25,000	$0
	Wall Core	1	EA	$1,500	$0	1.00	1.00	$1,500	$0
	Equipment								
	Process Equipment Item	0	EA	$0	0.00	1.00	1.00	$0	$0
	Piping and Valves (interior)								
	Lime System Bypass Piping	1	LS	$28,200	0.00	1.00	1.00	$28,200	$0
	Painting				0.00		1.00		
	Structure Surfaces	0	SF	$8	0.00	1.00	1.00	$0	$0
	Piping	408	SF	$15	0.00	1.00	1.00	$6,126	$0
	Equipment	0	EA	$0	0.00	1.00	1.00	$0	$0
	HVAC (C1D1/damp)	0	SF	$50	0.00	1.00	1.00	$0	$0
	HVAC (standard)	0	SF	$30	0.00	1.00	1.00	$0	$0
	Plumbing (C1D1/damp)	0	SF	$15	0.00	1.00	1.00	$0	$0
	Plumbing (standard)	0	SF	$10	0.00	1.00	1.00	$0	$0
	Cost Subtotal							**$60,826**	**$0**
C.2	**DRYER ROOM**								
	Demolition								
	Wall Core	2	EA	$1,500	$0	1.00	1.00	$3,000	$0
	Wall Penetration for Conveyor	1	EA	$7,500	$0	1.20	1.00	$9,000	$0
	Sawcutting	406	LF	$2.50	$0	1.00	1.00	$1,015	$0
	Demo Existing Floor	10192	SF	$2.50	$0	1.00	1.00	$25,480	$0
	Building Construction								
	Excavation	1396	CY	$30	$0	1.00	1.00	$41,877	$0
	Rock Excavation	0	CY	$100	$0	1.00	1.00	$0	$0
	Structural Fill	174	CY	$25	$0	1.00	1.00	$4,350	$0
	Concrete								
	Circular walls	0	CY	$675	$0	1.00	1.00	$0	$0
	Straight walls	77	CY	$600	$0	1.00	1.00	$46,222	$0
	Slab on soil	391	CY	$550	$0	1.00	1.00	$215,233	$0
	Shored slab	0	CY	$1,100	$0	1.00	1.00	$0	$0
	Shored beams	0	CY	$1,700	$0	1.00	1.00	$0	$0
	Columns	26	CY	$1,150	$0	1.00	1.00	$29,438	$0
	Concrete fill	0	CY	$400	$0	1.00	1.00	$0	$0
	Misc concrete	10.0	CY	$750	$0	1.00	1.00	$7,500	$0
	Block walls - split face (single wythe)	0	SF	$30	$0	1.00	1.00	$0	$0
	Block walls - split face (multi wythe)	6666	SF	$35	$0	1.00	1.00	$233,310	$0
	Block wall - plain	0	SF	$20	$0	1.00	1.00	$0	$0
	Concrete plank	9396	SF	$20	$0	1.00	1.00	$187,920	$0
	Architectural	9396	SF	$20	$0	1.00	1.00	$187,920	$0
	Overhead Doors	2	EA	$10,000	$0	1.20	1.00	$24,000	$0
	Misc. Metals	0	LS	$20	$0	1.00	1.00	$0	$0
	Stairs and Railings	0	LF	$100	$0	1.00	1.00	$0	$0
	Aluminum Railing	0	LF	$35	$0	1.00	1.00	$0	$0

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option C - Full Load Drying 24 hr, 4 day per week

Add to any additional costs for Option C

							PHASE 1 =	**$5,156,699**
							PHASE 2 =	**$2,389,130**
Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**
Equipment								
Dewatered Product Conveyor	2	EA	$120,000	$0	1.20	1.00	$288,000	$0
1040 U Gryphon Dryer (2 included in LS	1	LS	$3,930,556	$0	1.00	1.00	$3,930,556	$0
Dried Product Conveyor	1	LS	$149,750	$0	1.20	1.00	$179,700	$0
Dry Product Storage								
Equalization Silo	1	LS	$200,000	$0	1.20	1.00	$240,000	$0
4-cell bagging system/scales	1	LS	$103,040	$0	1.20	1.00	$123,648	$0
Screw conveyor	1	LS	$100,000	$0	1.20	1.00	$120,000	$0
Rotary Valves	4	EA	$15,000	$0	1.20	1.00	$72,000	$0
Piping and Valves (interior)								
Sludge Dryer Feed Piping	1	LS	$128,200	$0	1.00	1.00	$128,200	$0
Wash Water Suction	1	LS	$15,000	$0	1.00	1.00	$15,000	$0
Wash Water Discharge	1	LS	$21,200	$0	1.00	1.00	$21,200	$0
Condensate Drain	1	LS	$22,500	$0	1.00	1.00	$22,500	$0
Painting								
Structure Surfaces	17976	SF	$8	$0	1.00	1.00	$143,808	$0
Piping	2168	SF	$15	$0	1.00	1.00	$32,515	$0
Equipment	2	EA	$0	$0	1.00	1.00	$0	$0
New Natural Gas Service	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
HVAC (C1D1/damp)	9396	SF	$50	$0	1.00	1.00	$469,800	$0
HVAC (standard)	0	SF	$30	$0	1.00	1.00	$0	$0
Plumbing (C1D1/damp)	9396	SF	$15	$0	1.00	1.00	$140,940	$0
Plumbing (standard)	0	SF	$10	$0	1.00	1.00	$0	$0
Cost Subtotal							**$6,994,133**	**$0**
Odor Control Equipment								
Demolition								
Remove Existing Chemical Scrubber	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
Equipment								
Bohn Biofilter	1	LS	$34,000	$0	1.20	1.00	$40,800	$0
Construction								
Excavation	74	CY	$30	$0	1.00	1.00	$2,222	$0
Concrete	15	CY	$600	$0	1.00	1.00	$8,889	$0
Accessories								
Inside Ductwork	3715	SF	$50	$0	1.00	1.00	$185,725	$0
Ductwork to Blower	75	LF	$100	$0	1.00	1.00	$7,500	$0
6" Drain	150	LF	$70	$0	1.00	1.00	$10,500	$0
Water - Irrigation	150	LF	$65	$0	1.00	1.00	$9,750	$0
Cost Subtotal							**$315,386**	**$0**
Construction Subtotal							**$7,370,345**	**$0**
Electrical			10%	10%			$737,034	$0
Construction Subtotal with Electrical							**$8,107,379**	**$0**
Additional Contractor Costs			9%	9%			$729,664	$0
Total Construction Cost							**$8,837,043**	**$0**
Additional Design and Management Costs								
Contingencies			10%	10%			$883,704	$0
Engineering, Admin, Legal			15%	15%			$1,325,557	$0
Resident Engineering			3%	3%			$265,111	$0
Cost Subtotal							**$2,474,372**	**$0**
Total Project Cost							**$11,311,416**	**$0**
Total OF ALL PROCESSES Project Cost							**$16,468,114**	**$2,389,130**
							Sum:	**$18,857,244**

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West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option C - Full Load Drying 24 hr, 4 day per week

Add to any additional costs for Option C

							PHASE 1 =	**$5,156,699**	
							PHASE 2 =		**$2,389,130**
	Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**
C.1	**BIOSET**								
	Demolition								
	Demo Lime System Equipment	1	LS	$25,000	$0	1.00	1.00	$25,000	$0
	Wall Core	1	EA	$1,500	$0	1.00	1.00	$1,500	$0
	Equipment								
	Process Equipment Item	0	EA	$0	0.00	1.00	1.00	$0	$0
	Piping and Valves (interior)								
	Lime System Bypass Piping	1	LS	$28,200	0.00	1.00	1.00	$28,200	$0
	Painting				0.00		1.00		
	Structure Surfaces	0	SF	$8	0.00	1.00	1.00	$0	$0
	Piping	408	SF	$15	0.00	1.00	1.00	$6,126	$0
	Equipment	0	EA	$0	0.00	1.00	1.00	$0	$0
	HVAC (C1D1/damp)	0	SF	$50	0.00	1.00	1.00	$0	$0
	HVAC (standard)	0	SF	$30	0.00	1.00	1.00	$0	$0
	Plumbing (C1D1/damp)	0	SF	$15	0.00	1.00	1.00	$0	$0
	Plumbing (standard)	0	SF	$10	0.00	1.00	1.00	$0	$0
	Cost Subtotal							**$60,826**	**$0**
C.2	**DRYER ROOM**								
	Demolition								
	Wall Core	2	EA	$1,500	$0	1.00	1.00	$3,000	$0
	Wall Penetration for Conveyor	1	EA	$7,500	$0	1.20	1.00	$9,000	$0
	Sawcutting	406	LF	$2.50	$0	1.00	1.00	$1,015	$0
	Demo Existing Floor	10192	SF	$2.50	$0	1.00	1.00	$25,480	$0
	Building Construction								
	Excavation	1396	CY	$30	$0	1.00	1.00	$41,877	$0
	Rock Excavation	0	CY	$100	$0	1.00	1.00	$0	$0
	Structural Fill	174	CY	$25	$0	1.00	1.00	$4,350	$0
	Concrete								
	Circular walls	0	CY	$675	$0	1.00	1.00	$0	$0
	Straight walls	77	CY	$600	$0	1.00	1.00	$46,222	$0
	Slab on soil	391	CY	$550	$0	1.00	1.00	$215,233	$0
	Shored slab	0	CY	$1,100	$0	1.00	1.00	$0	$0
	Shored beams	0	CY	$1,700	$0	1.00	1.00	$0	$0
	Columns	26	CY	$1,150	$0	1.00	1.00	$29,438	$0
	Concrete fill	0	CY	$400	$0	1.00	1.00	$0	$0
	Misc concrete	10.0	CY	$750	$0	1.00	1.00	$7,500	$0
	Block walls - split face (single wythe)	0	SF	$30	$0	1.00	1.00	$0	$0
	Block walls - split face (multi wythe)	6666	SF	$35	$0	1.00	1.00	$233,310	$0
	Block wall - plain	0	SF	$20	$0	1.00	1.00	$0	$0
	Concrete plank	9396	SF	$20	$0	1.00	1.00	$187,920	$0
	Architectural	9396	SF	$20	$0	1.00	1.00	$187,920	$0
	Overhead Doors	2	EA	$10,000	$0	1.20	1.00	$24,000	$0
	Misc. Metals	0	LS	$20	$0	1.00	1.00	$0	$0
	Stairs and Railings	0	LF	$100	$0	1.00	1.00	$0	$0
	Aluminum Railing	0	LF	$35	$0	1.00	1.00	$0	$0

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option C - Full Load Drying 24 hr, 4 day per week

Add to any additional costs for Option C

							PHASE 1 =	**$5,156,699**
							PHASE 2 =	**$2,389,130**
Description	**Qty**	**Units**	10-Year Projection **Unit Cost**	20-Year Projection **Unit Cost**	**Install Factor**	**Site Const.**	10-Year Projection **Installed Cost**	20-Year Projection **Installed Cost**
Equipment								
Dewatered Product Conveyor	2	EA	$120,000	$0	1.20	1.00	$288,000	$0
1040 U Gryphon Dryer (2 included in LS	1	LS	$3,930,556	$0	1.00	1.00	$3,930,556	$0
Dried Product Conveyor	1	LS	$149,750	$0	1.20	1.00	$179,700	$0
Dry Product Storage								
Dry Product Silos	2	EA	$240,000	$0	1.35	1.00	$648,000	$0
Pnuematic Conveyor	2	EA	$120,000	$0	1.20	1.00	$288,000	$0
Discharge Bin Activator	2	LS	$25,000	$0	1.20	1.00	$60,000	$0
Discharge Conveyor	1	EA	$75,000	$0	1.20	1.00	$90,000	$0
Nitrogen Purge System	2	EA	$50,000	$0	1.20	1.00	$120,000	$0
Controls Enclosure	1	EA	$20,000	$0	1.20	1.00	$24,000	$0
Loadout Shed	1500	SF	$250	$0	1.20	1.00	$450,000	$0
Excavation	961	CY	$30	$0	1.00	1.00	$28,830	$0
Structural Fill	160	CY	$25	$0	1.00	1.00	$4,004	$0
Concrete Foundations/Footings	320	CY	$600	$0	1.00	1.00	$192,200	$0
Site Work	1	LS	$40,000	$0	1.20	1.00	$48,000	$0
Piping and Valves (interior)								
Sludge Dryer Feed Piping	1	LS	$128,200	$0	1.00	1.00	$128,200	$0
Wash Water Suction	1	LS	$15,000	$0	1.00	1.00	$15,000	$0
Wash Water Discharge	1	LS	$21,200	$0	1.00	1.00	$21,200	$0
Condensate Drain	1	LS	$22,500	$0	1.00	1.00	$22,500	$0
Painting								
Structure Surfaces	17976	SF	$8	$0	1.00	1.00	$143,808	$0
Piping	2168	SF	$15	$0	1.00	1.00	$32,515	$0
Equipment	2	EA	$0	$0	1.00	1.00	$0	$0
New Natural Gas Service	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
HVAC (C1D1/damp)	9396	SF	$50	$0	1.00	1.00	$469,800	$0
HVAC (standard)	0	SF	$30	$0	1.00	1.00	$0	$0
Plumbing (C1D1/damp)	9396	SF	$15	$0	1.00	1.00	$140,940	$0
Plumbing (standard)	0	SF	$10	$0	1.00	1.00	$0	$0
Cost Subtotal							**$8,391,519**	**$0**
Odor Control Equipment								
Demolition								
Remove Existing Chemical Scrubber	1	LS	$50,000	$0	1.00	1.00	$50,000	$0
Equipment								
Bohn Biofilter	1	LS	$34,000	$0	1.20	1.00	$40,800	$0
Construction								
Excavation	74	CY	$30	$0	1.00	1.00	$2,222	$0
Concrete	15	CY	$600	$0	1.00	1.00	$8,889	$0
Accessories								
Inside Ductwork	3715	SF	$50	$0	1.00	1.00	$185,725	$0
Ductwork to Blower	75	LF	$100	$0	1.00	1.00	$7,500	$0
6" Drain	150	LF	$70	$0	1.00	1.00	$10,500	$0
Water - Irrigation	150	LF	$65	$0	1.00	1.00	$9,750	$0
Cost Subtotal							**$315,386**	**$0**
Construction Subtotal							**$8,767,731**	**$0**
Electrical			10%	10%			$876,773	$0
Construction Subtotal with Electrical							**$9,644,504**	**$0**
Additional Contractor Costs			9%	9%			$868,005	$0
Total Construction Cost							**$10,512,509**	**$0**
Additional Design and Management Costs								
Contingencies			10%	10%			$1,051,251	$0
Engineering, Admin, Legal			15%	15%			$1,576,876	$0
Resident Engineering			3%	3%			$315,375	$0
Cost Subtotal							**$2,943,503**	**$0**
Total Project Cost							**$13,456,012**	**$0**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Option C - Full Load Drying 24 hr, 4 day per week

Add to any additional costs for Option C

PHASE 1 =	**$5,156,699**	
PHASE 2 =		**$2,389,130**

Description	Qty	Units	10-Year Projection Unit Cost	20-Year Projection Unit Cost	Install Factor	Site Const.	10-Year Projection Installed Cost	20-Year Projection Installed Cost
Total OF ALL PROCESSES Project Cost							**$18,612,711**	**$2,389,130**
						Sum:	**$21,001,840**	

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Present Worth Evaluation - O&M

Annual Growth % 2%

Acc. #	Item	2020 Budget	Alternative A Lime Only			Alternative B1 Lime + Dry			Alternative B2 Lime + Dry Full 24/4			Alternative C1 - Silos Dry Only			Alternative C2 - Silos Dry Only 24/4			Alternative C1 - Bagging Dry Only			Alternative C2 - Bagging Dry Only 24/4		
			Start-Up	Phase 1 (2028)	Phase 2 (2038)	Start-Up	Phase 1 (2028)	Phase 2 (2038)	Start-Up	Phase 1 (2028)	Phase 2 (2038)	Start-Up	Phase 1 (2028)	Phase 2 (2038)	Start-Up	Phase 1 (2028)	Phase 2 (2038)	Start-Up	Phase 1 (2028)	Phase 2 (2038)	Start-Up	Phase 1 (2028)	Phase 2 (2038)
Operational Expenses																							
100-00-51110	Salaries and Wages	$156,790.28	$156,790.28	$187,378.90	$228,413.83	$235,185.42	$281,068.35	$342,620.75	$235,185.42	$281,068.35	$342,620.75	$156,790.28	$187,378.90	$228,413.83	$156,790.28	$187,378.90	$228,413.83	$235,185.42	$281,068.35	$342,620.75	$235,185.42	$281,068.35	$342,620.75
100-00-51121	FICA/Medicare	$11,994.46	$11,994.46	$11,994.46	$11,994.46	$17,991.69	$17,991.69	$17,991.69	$17,991.69	$17,991.69	$17,991.69	$11,994.46	$11,994.46	$11,994.46	$11,994.46	$11,994.46	$11,994.46	$17,991.69	$17,991.69	$17,991.69	$17,991.69	$17,991.69	$17,991.69
100-00-51122	Retirement	$10,583.34	$10,583.34	$10,583.34	$10,583.34	$15,875.01	$15,875.01	$15,875.01	$15,875.01	$15,875.01	$15,875.01	$10,583.34	$10,583.34	$10,583.34	$10,583.34	$10,583.34	$10,583.34	$15,875.01	$15,875.01	$15,875.01	$15,875.01	$15,875.01	$15,875.01
100-00-51131	Health Insurance	$84,000.00	$84,000.00	$84,000.00	$84,000.00	$126,000.00	$126,000.00	$126,000.00	$126,000.00	$126,000.00	$126,000.00	$84,000.00	$84,000.00	$84,000.00	$84,000.00	$84,000.00	$84,000.00	$126,000.00	$126,000.00	$126,000.00	$126,000.00	$126,000.00	$126,000.00
100-00-51132	Life Insurance	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00
100-00-51133	Health Savings Accounts	$9,000.00	$9,000.00	$9,000.00	$9,000.00	$13,500.00	$13,500.00	$13,500.00	$13,500.00	$13,500.00	$13,500.00	$9,000.00	$9,000.00	$9,000.00	$9,000.00	$9,000.00	$9,000.00	$13,500.00	$13,500.00	$13,500.00	$13,500.00	$13,500.00	$13,500.00
100-00-51210	Telephone	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00
100-00-51220	Water & Sewer Services	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00	$7,000.00
100-00-51230	Electricity	$65,000.00	$65,000.00	$76,774.55	$108,364.55	$107,432.38	$199,901.79	$255,078.99	$107,827.20	$191,029.65	$234,322.77	$126,520.11	$216,141.39	$274,405.68	$135,306.39	$227,029.57	$287,679.79	$126,520.11	$216,141.39	$274,405.68	$135,306.39	$227,029.57	$287,679.79
100-00-51240	Natural Gas	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00
	Sludge Dryer Gas		$0.00	$0.00	$0.00	$93,132.17	$133,225.75	$162,523.67	$104,039.94	$129,153.02	$159,288.73	$135,057.82	$167,366.91	$204,042.09	$165,490.12	$205,079.35	$250,018.47	$135,057.82	$167,366.91	$204,042.09	$165,490.12	$205,079.35	$250,018.47
100-00-51250	Training	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00
100-00-51260	Lawn Care	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00
100-00-51310	Sludge Conditioning Chemicals	$175,000.00	$175,000.00	$209,141.20	$254,941.96	$175,000.00	$209,141.20	$254,941.96	$175,000.00	$209,141.20	$254,941.96	$175,000.00	$209,141.20	$254,941.96	$175,000.00	$209,141.20	$254,941.96	$175,000.00	$209,141.20	$254,941.96	$175,000.00	$209,141.20	$254,941.96
100-00-51320	Hot Dust/Lime	$165,000.00	$165,000.00	$197,190.27	$240,373.84	$165,000.00	$197,190.27	$240,373.84	$165,000.00	$197,190.27	$240,373.84	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-51340	Sulfamic Acid	$10,000.00	$10,000.00	$11,950.93	$14,568.11	$10,000.00	$11,950.93	$14,568.11	$10,000.00	$11,950.93	$14,568.11	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-51410	Lab Supplies	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00
100-00-51420	Outside Lab Testing	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00
100-00-51425	Misc. General Expenses	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00	$14,000.00
100-00-51426	Boot Allowance	$300.00	$300.00	$300.00	$300.00	$450.00	$450.00	$450.00	$450.00	$450.00	$450.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$450.00	$450.00	$450.00	$450.00	$450.00	$450.00
100-00-51427	Engineering	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00
100-00-51510	Fuel for Equipment	$3,000.00	$3,000.00	$3,585.28	$4,370.43	$3,000.00	$3,585.28	$4,370.43	$3,000.00	$3,585.28	$4,370.43	$3,000.00	$3,585.28	$4,370.43	$3,000.00	$3,585.28	$4,370.43	$3,000.00	$3,585.28	$4,370.43	$3,000.00	$3,585.28	$4,370.43
100-00-51620	Contingency	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00
100-00-51621	Centrate Treatment & Hauling	$25,000.00	$25,000.00	$29,877.31	$36,420.28	$25,000.00	$29,877.31	$36,420.28	$25,000.00	$29,877.31	$36,420.28	$25,000.00	$29,877.31	$36,420.28	$25,000.00	$29,877.31	$36,420.28	$25,000.00	$29,877.31	$36,420.28	$25,000.00	$29,877.31	$36,420.28
100-00-51710	Phosphorus Chemicals	$65,000.00	$65,000.00	$77,681.02	$94,692.73	$65,000.00	$77,681.02	$94,692.73	$65,000.00	$77,681.02	$94,692.73	$65,000.00	$77,681.02	$94,692.73	$65,000.00	$77,681.02	$94,692.73	$65,000.00	$77,681.02	$94,692.73	$65,000.00	$77,681.02	$94,692.73
100-00-51810	Property and Liability Ins.-Bond	$15,000.00	$15,000.00	$15,000.00	$15,000.00	$30,000.00	$30,000.00	$30,000.00	$25,000.00	$25,000.00	$25,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00
100-00-51820	Workers Compensation	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$15,000.00	$15,000.00	$15,000.00	$15,000.00	$15,000.00	$15,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$15,000.00	$15,000.00	$15,000.00	$15,000.00	$15,000.00	$15,000.00
100-00-51825	Payment for Gov. Services (Tax)	$46,412.33	$46,412.33	$57,962.64	$74,197.08	$46,412.33	$57,962.64	$74,197.08	$46,412.33	$57,962.64	$74,197.08	$46,412.33	$57,962.64	$74,197.08	$46,412.33	$57,962.64	$74,197.08	$46,412.33	$57,962.64	$74,197.08	$46,412.33	$57,962.64	$74,197.08
100-00-51850	Environmental Fees	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00	$380.00
100-00-51990	Odor Control Chemicals	$50,000.00	$50,000.00	$59,754.63	$72,840.56	$50,000.00	$59,754.63	$72,840.56	$50,000.00	$59,754.63	$72,840.56	$50,000.00	$59,754.63	$72,840.56	$50,000.00	$59,754.63	$72,840.56	$50,000.00	$59,754.63	$72,840.56	$50,000.00	$59,754.63	$72,840.56
100-00-51000	**Total Operation Expense**	**$996,460.41**	**$996,460.41**	**$1,146,554.52**	**$1,364,441.17**	**$1,290,859.00**	**$1,577,035.87**	**$1,868,325.10**	**$1,297,161.59**	**$1,559,091.00**	**$1,839,333.94**	**$1,033,038.33**	**$1,259,147.08**	**$1,494,582.44**	**$1,072,256.92**	**$1,307,747.69**	**$1,553,832.93**	**$1,176,872.37**	**$1,418,275.43**	**$1,674,228.26**	**$1,216,090.96**	**$1,466,876.04**	**$1,733,478.75**

Maintenance																							
100-00-52110	Maint. Of Structure & Improvements	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00	$40,000.00
	Maint. Of Additional Storage		$3,000.00	$10,000.00	$10,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	Maint. Of Chemical Feed		$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00
100-00-52116	Safety Training & Supplies	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00
100-00-52120	Maint. Of Heat, Ventilation, & AC	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00
100-00-52210	Maint. Of Dewatering Equip.	$10,000.00	$10,000.00	$20,000.00	$20,000.00	$10,000.00	$20,000.00	$20,000.00	$10,000.00	$20,000.00	$20,000.00	$10,000.00	$20,000.00	$20,000.00	$10,000.00	$20,000.00	$20,000.00	$10,000.00	$20,000.00	$20,000.00	$10,000.00	$20,000.00	$20,000.00
100-00-52220	Maint. Of Bioset	$10,000.00	$10,000.00	$11,950.93	$14,568.11	$10,000.00	$11,950.93	$14,568.11	$10,000.00	$11,950.93	$14,568.11	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	Maint. Of Sludge Dryer		$0.00	$0.00	$0.00	$20,000.00	$23,901.85	$29,136.22	$15,000.00	$17,926.39	$21,852.17	$20,000.00	$23,901.85	$29,136.22	$20,000.00	$23,901.85	$29,136.22	$20,000.00	$23,901.85	$29,136.22	$20,000.00	$23,901.85	$29,136.22
100-00-52230	Maint. Of Screener	$500.00	$500.00	$1,000.00	$1,000.00	$500.00	$1,000.00	$1,000.00	$500.00	$1,000.00	$1,000.00	$500.00	$1,000.00	$1,000.00	$500.00	$1,000.00	$1,000.00	$500.00	$1,000.00	$1,000.00	$500.00	$1,000.00	$1,000.00
100-00-52240	Maint. Of Conveying Equip	$500.00	$1,000.00	$1,195.09	$1,456.81	$1,000.00	$1,195.09	$1,456.81	$1,000.00	$1,195.09	$1,456.81	$1,000.00	$1,195.09	$1,456.81	$1,000.00	$1,195.09	$1,456.81	$1,000.00	$1,195.09	$1,456.81	$1,000.00	$1,195.09	$1,456.81
100-00-52250	Maint. Of Loader	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00
100-00-52255	Truck Maintenance	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00
100-00-52260	Maint. Scale	$4,000.00	$4,000.00	$4,780.37	$5,827.24	$4,000.00	$4,780.37	$5,827.24	$4,000.00	$4,780.37	$5,827.24	$4,000.00	$4,780.37	$5,827.24	$4,000.00	$4,780.37	$5,827.24	$4,000.00	$4,780.37	$5,827.24	$4,000.00	$4,780.37	$5,827.24
100-00-52270	Maint. Of Sludge Storage Tanks	$5,000.00	$5,000.00	$5,975.46	$7,284.06	$5,000.00	$5,975.46	$7,284.06	$5,000.00	$5,975.46	$7,284.06	$5,000.00	$5,975.46	$7,284.06	$5,000.00	$5,975.46	$7,284.06	$5,000.00	$5,975.46	$7,284.06	$5,000.00	$5,975.46	$7,284.06
	Maint. Of Centrate Storage Tank		$ 3,000.00	$ 3,585.28	$ 4,370.43	$ 3,000.00	$ 3,585.28	$ 4,370.43	$ 3,000.00	$ 3,585.28	$ 4,370.43	$ 3,000.00	$ 3,585.28	$ 4,370.43	$ 3,000.00	$ 3,585.28	$ 4,370.43	$ 3,000.00	$ 3,585.28	$ 4,370.43	$ 3,000.00	$ 3,585.28	$ 4,370.43
100-00-52280	Maint. Sludge Feed Pumps	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00
100-00-52300	Maint. Of Odor Control Equip.	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00
100-00-52400	Maint of Silos	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-52810	Maint of Office Equip.	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00
100-00-52910	Projects	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00	$200,000.00
100-00-52990	Maint. Of Other Equip.	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00
200-00-59100	Transfer from Replacement to General	$ (200,000.00)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
100-00-52000	**Total Maintenance Expense**	**$124,500.00**	**$334,000.00**	**$355,987.13**	**$362,006.66**	**$351,000.00**	**$369,888.98**	**$381,142.88**	**$346,000.00**	**$363,913.52**	**$373,858.82**	**$339,000.00**	**$355,938.05**	**$364,574.77**	**$339,000.00**	**$355,938.05**	**$364,574.77**	**$339,000.00**	**$355,938.05**	**$364,574.77**	**$339,000.00**	**$355,938.05**	**$364,574.77**
Administrative																							
100-00-53110	Salaries and Wages	$18,000.00	$18,000.00	$19,686.33	$21,745.96	$18,000.00	$19,686.33	$21,745.96	$18,000.00	$19,686.33	$21,745.96	$18,000.00	$19,686.33	$21,745.96	$18,000.00	$19,686.33	$21,745.96	$18,000.00	$19,686.33	$21,745.96	$18,000.00	$19,686.33	$21,745.96
100-00-53121	FICA/Medicare	$1,400.00	$1,400.00	$1,531.16	$1,691.35	$1,400.00	$1,531.16	$1,691.35	$1,400.00	$1,531.16	$1,691.35	$1,400.00	$1,531.16	$1,691.35	$1,400.00	$1,531.16	$1,691.35	$1,400.00	$1,531.16	$1,691.35	$1,400.00	$1,531.16	$1,691.35
100-00-53122	Retirement	$1,215.00	$1,215.00	$1,585.30	$2,130.51	$1,215.00	$1,585.30	$2,130.51	$1,215.00	$1,585.30	$2,130.51	$1,215.00	$1,585.30	$2,130.51	$1,215.00	$1,585.30	$2,130.51	$1,215.00	$1,585.30	$2,130.51	$1,215.00	$1,585.30	$2,130.51
100-00-53131	Health Insurance	$7,000.00	$7,000.00	$9,133.41	$12,274.54	$7,000.00	$9,133.41	$12,274.54	$7,000.00	$9,133.41	$12,274.54	$7,000.00	$9,133.41	$12,274.54	$7,000.00	$9,133.41	$12,274.54	$7,000.00	$9,133.41	$12,274.54	$7,000.00	$9,133.41	$12,274.54
100-00-53132	Life Insurance	$500.00	$500.00	$652.39	$876.75	$500.00	$652.39	$876.75	$500.00	$652.39	$876.75	$500.00	$652.39	$876.75	$500.00	$652.39	$876.75	$500.00	$652.39	$876.75	$500.00	$652.39	$876.75
100-00-53210	Commission Expenses	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00
100-00-53310	Office Supplies and Expenses	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00
100-00-53315	Outside Legal Services	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00
100-00-53316	Outside Bookkeeping Services	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-53410	Accounting & Auditing	$13,000.00	$13,000.00	$22,131.63	$37,677.62	$13,000.00	$64,143.62	$22,131.63	$13,000.00	$37,677.62	$22,131.63	$13,000.00	$37,677.62	$22,131.63	$13,000.00	$37,677.62	$22,131.63	$13,000.00	$37,677.62	$22,131.63	$13,000.00	$37,677.62	$22,131.63
100-00-53420	Engineering	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00
100-00-53990	Misc. General Expenses	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00	$4,000.00
100-00-53000	**Total Administrative**	**$93,115.00**	**$93,115.00**	**$106,720.22**	**$128,396.74**	**$93,115.00**	**$148,732.22**	**$112,850.75**	**$93,115.00**	**$122,266.21**	**$112,850.75**	**$93,115.00**	**$122,266.21**	**$112,850.75**	**$93,115.00**	**$122,266.21**	**$112,850.75**	**$93,115.00**	**$122,266.21**	**$112,850.75**	**$93,115.00**	**$122,266.21**	**$112,850.75**
Transportation																							
100-00-54100	Transportation of Biosolids	$845,748.00	$845,748.00	$1,010,747.15	$1,232,095.14	$845,748.00	$1,010,747.15	$1,232,095.14	$845,748.00	$1,010,747.15	$1,232,095.14	$845,748.00	$1,010,747.15	$1,232,095.14	$845,748.00	$1,010,747.15	$1,232,095.14	$845,748.00	$1,010,747.15	$1,232,095.14	$845,748.00	$1,010,747.15	$1,232,095.14
	Transportation of Centrate	$50,000.00	$50,000.00	$59,754.63	$72,840.56	$52,916.27	$65,194.68	$79,472.57	$52,916.27	$65,194.68	$79,472.57	$53,956.40	$66,315.45	$80,838.41	$53,956.40	$66,315.45	$80,838.41	$56,872.67	$71,755.50	$87,470.42	$56,872.67	$71,755.50	$87,470.42
100-00-54000	**Total Transportation**	**$895,748.00**	**$895,748.00**	**$1,070,501.78**	**$1,304,935.69**	**$898,664.27**	**$1,075,941.83**	**$1,311,567.70**	**$898,664.27**	**$1,075,941.83**	**$1,311,567.70**	**$899,704.40**	**$1,077,062.60**	**$1,312,933.54**	**$899,704.40**	**$1,077,062.60**	**$1,312,933.54**	**$902,620.67**	**$1,082,502.65**	**$1,319,565.55**	**$902,620.67**	**$1,082,502.65**	**$1,319,565.55**
Subsidiary Expenses																							
100-00-55100	Product marketing and distribution	$60,000.00	$60,000.00	$71,705.55	$87,408.67	$29,571.75	$50,152.05	$61,138.35	$29,571.75	$50,152.05	$61,138.35	$13,449.15	$22,815.00	$27,805.05	$13,449.15	$22,815.00	$27,805.05	$13,449.15	$22,815.00	$27,805.05	$13,449.15	$22,815.00	$27,805.05
100-00-55250	Research/Development	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-55270	Contingency	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-55700	Rental and Equip.	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-55000	**Total Subsidiary**	**$60,000.00**	**$60,000.00**	**$71,705.55**	**$87,408.67**	**$29,571.75**	**$50,152.05**	**$61,138.35**	**$29,571.75**	**$50,152.05**	**$61,138.35**	**$13,449.15**	**$22,815.00**	**$27,805.05**	**$13,449.15**	**$22,815.00**	**$27,805.05**	**$13,449.15**	**$22,815.00**	**$27,805.05**	**$13,449.15**	**$22,815.00**	**$27,805.05**
Transfers																							
100-00-59200	Transfer to Equip. Repl. Fund	$300,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-59300	Transfer to Debt Service Fund	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-59500	Capital Fund	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
100-00-59000	**Total Transfers**	**$300,000.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
	Total Expenditures	**$2,469,823**	**$2,379,323**	**$2,751,469**	**$3,247,189**	**$2,663,210**	**$3,221,751**	**$3,735,025**	**$2,664,513**	**$3,171,365**	**$3,698,750**	**$2,378,307**	**$2,837,229**	**$3,312,747**	**$2,417,525**	**$2,885,830**	**$3,371,997**	**$2,525,057**	**$3,001,797**	**$3,499,024**	**$2,564,276**	**$3,050,398**	**$3,558,275**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
11/7/2019
Present Worth Evaluation - Replacement Fund

Inflation Rate for Future Equipment Cost	0.00%
Interest Rate for Calculation	4.500%
Current Year	2019

										Silos		Bagging	
Description	**Purchase Cost**	**Quantity**	**Equip Life**	**Equip Install**	**Inflated Cost**	**Annual Fund $**	**Alternative A Continued Lime Stabilization, No Sludge Drying**	**Alternative B1 Continued Lime Stabilization, Sludge Drying to 60% (10 Hr Days)**	**Alternative B2 Continued Lime Stabilization, Sludge Drying to 60% (Full Load, 24 Hrs)**	**Alternative C1 Remove Lime Stabilization, Sludge Drying to 90% (10 Hr Days)**	**Alternative C2 Remove Lime Stabilization, Sludge Drying to 90% (24 Hr Days)**	**Alternative C1 Remove Lime Stabilization, Sludge Drying to 90% (10 Hr Days)**	**Alternative C2 Remove Lime Stabilization, Sludge Drying to 90% (24 Hr Days)**
General Items													
Sludge Unloading													
Truck Scale (Phase 1)	$100,000	1	20	20%	$120,000	$3,825	$3,825	$3,825	$3,825	$3,825	$3,825	$3,825	$3,825
Truck Scale (Phase 2)	$100,000	0	20	20%	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sludge Screen (Phase 1)	$175,000	1	20	20%	$210,000	$6,694	$6,694	$6,694	$6,694	$6,694	$6,694	$6,694	$6,694
Sludge Screen (Phase 2)	$175,000	0	15	20%	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sludge Storage and Pumping													
Sludge Mixing Pump	$20,000	2	20	20%	$48,000	$1,530	$1,530	$1,530	$1,530	$1,530	$1,530	$1,530	$1,530
Sludge Feed Pump (Phase 2)	$20,000	3	20	20%	$72,000	$2,295	$2,295	$2,295	$2,295	$2,295	$2,295	$2,295	$2,295
Centrate Storage													
Mixing Equipment	$15,000	4	20	20%	$72,000	$2,295	$2,295	$2,295	$2,295	$2,295	$2,295	$2,295	$2,295
Tank Cover	$75,000	2	20	20%	$180,000	$5,738	$5,738	$5,738	$5,738	$5,738	$5,738	$5,738	$5,738
Submersible Pumps	$15,000	4	20	20%	$72,000	$2,295	$2,295	$2,295	$2,295	$2,295	$2,295	$2,295	$2,295
Odor Control Blower	$15,000	1	20	20%	$18,000	$574	$574	$574	$574	$574	$574	$574	$574
Chemical Feed													
Chemical Pumps	$4,000	6	20	20%	$28,800	$918	$918	$918	$918	$918	$918	$918	$918
Chemical Tanks	$3,500	6	20	20%	$25,200	$803	$803	$803	$803	$803	$803	$803	$803
Centrifuge													
Centrifuge	$543,900	1	20	20%	$652,680	$20,805	$20,805	$20,805	$20,805	$20,805	$20,805	$20,805	$20,805
Polymer	$15,000	1	20	20%	$18,000	$574	$574	$574	$574	$574	$574	$574	$574
Conveyor	$40,000	1	20	20%	$48,000	$1,530	$1,530	$1,530	$1,530	$1,530	$1,530	$1,530	$1,530
Sludge Processing Equipment													
Lime Stabilization	$82,000	1	20	20%	$98,400	$3,137	$3,137	$3,137	$3,137				
Dryer - 1030	$1,514,167	1	20	20%	$1,817,000	$57,919							
Dryer - 1040	$3,141,300	1	20	20%	$3,769,560	$120,159		$120,159					
Dryer - 1040 (24/4)	$3,930,556	1	20	20%	$4,716,667	$150,349					$150,349		$150,349
Dryer - 1050	$2,038,056	1	20	20%	$2,445,667	$77,958			$77,958				
Dryer - 1060	$4,000,000	1	20	20%	$4,800,000	$153,005				$153,005		$153,005	
Dried Product Conveyor	$149,750	1	20	20%	$179,700	$5,728		$5,728	$5,728	$5,728	$5,728	$5,728	$5,728
Dried Product Storage Silos	$558,000	1	20	20%	$669,600	$21,344				$21,344	$21,344		
Bagging System	$315,648	1	20	20%	$378,778	$12,074						$12,074	$12,074
Odor Control - Biofilter													
Alt A	$650,000	1	10	20%	$780,000	$63,475	$63,475						
Alt B1	$639,715	1	10	20%	$767,658	$62,471		$62,471					
Alt B2	$716,263	1	10	20%	$859,516	$69,946			$69,946				
Alt B3	$766,700	1	10	20%	$920,040	$74,872							
Alt C1	$51,000	1	10	20%	$61,200	$4,980				$4,980		$4,980	
Alt C2	$34,000	1	10	20%	$40,800	$3,320					$3,320		$3,320
					New (Phase 1)		**$91,284**	**$216,167**	**$181,442**	**$209,730**	**$205,414**	**$200,460**	**$196,144**
					New (Phase 2)		**$25,204**	**$25,204**	**$25,204**	**$25,204**	**$25,204**	**$25,204**	**$25,204**

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
6/25/2020
Present Worth Evaluation Summary

	Alternative A Continued Lime Stabilization, No Sludge Drying	Alternative B-1 Continued Lime Stabilization, Sludge Drying to 60% (10 Hr Days)	Alternative B-2 Continued Lime Stabilization, Sludge Drying to 60% (Full Load, 24 Hrs)
Capital Cost	$ 12,155,168	$ 22,710,253	$ 18,258,360
Year 1 O&M	$ 2,379,323	$ 2,663,210	$ 2,664,513
Year 1 Replacement	$ 91,284	$ 216,167	$ 181,442
20 Year Present Worth	$ 52,367,678	$ 71,058,195	$ 65,854,947
Capital P&I	$779,719	$1,456,798	$1,171,221
Annual Cost	$3,250,327	$4,336,175	$4,017,176

	Alternative C1 - Silos Remove Lime Stabilization, Sludge Drying to 90% (10 Hr Days)	Alternative C2 - Silos Remove Lime Stabilization, Sludge Drying to 90% (24 Hr Days)	Alternative C1 - Bagging Remove Lime Stabilization, Sludge Drying to 90% (10 Hr Days)	Alternative C2 - Bagging Remove Lime Stabilization, Sludge Drying to 90% (24 Hr Days)
Capital Cost	$ 23,437,779	$ 21,001,840	$ 21,293,183	$ 18,857,244
Year 1 O&M	$ 2,378,307	$ 2,417,525	$ 2,525,057	$ 2,564,276
Year 1 Replacement	$ 209,730	$ 205,414	$ 200,460	$ 196,144
20 Year Present Worth	$ 66,207,806	$ 64,914,687	$ 66,311,261	$ 65,018,141
Capital P&I	$1,503,466	$1,347,208	$1,365,897	$1,209,638
Annual Cost	$4,091,504	$3,970,147	$4,091,414	$3,970,057

West Central Biosolids Facility
Facilities Plan
Facility Upgrades Cost Estimate
12/19/2019
Present Worth Evaluation

Rate of Return	3.625%
Capital Inflation	0.0%
O&M Inflation	0.0%

		Alternative A					**Alternative B1**				
		Continued Lime Stabilization, No Sludge Drying					**Continued Lime Stabilization, Sludge Drying to 60% (10 Hr Days)**				
Year #	Year	Capital Costs	O&M Costs	Replacement Fund	Annual Cost	PW	Capital Costs	O&M Costs	Replacement Fund	Annual Cost	PW
Year 1	2019	$7,759,699	$2,379,323	$91,284	$10,230,306	$10,230,306	$19,276,569	$2,663,210	$216,167	$22,155,946	$22,155,946
Year 2	2020		$2,420,673	$91,284	$2,511,957	$2,424,084		$2,725,270	$216,167	$2,941,437	$2,838,540
Year 3	2021		$2,462,022	$91,284	$2,553,307	$2,377,792		$2,787,330	$216,167	$3,003,497	$2,797,037
Year 4	2022		$2,503,372	$91,284	$2,594,656	$2,331,773		$2,849,390	$216,167	$3,065,557	$2,754,963
Year 5	2023		$2,544,722	$91,284	$2,636,006	$2,286,063		$2,911,450	$216,167	$3,127,617	$2,712,411
Year 6	2024		$2,586,071	$91,284	$2,677,355	$2,240,698		$2,973,511	$216,167	$3,189,678	$2,669,464
Year 7	2025		$2,627,421	$91,284	$2,718,705	$2,195,709		$3,035,571	$216,167	$3,251,738	$2,626,203
Year 8	2026		$2,668,770	$91,284	$2,760,054	$2,151,126		$3,097,631	$216,167	$3,313,798	$2,582,701
Year 9	2027		$2,710,120	$91,284	$2,801,404	$2,106,975		$3,159,691	$216,167	$3,375,858	$2,539,030
Year 10	2028	$4,395,469	$2,751,469	$116,488	$7,263,427	$5,271,821	$3,433,684	$3,221,751	$241,371	$6,896,805	$5,005,726
Year 11	2029		$2,801,041	$116,488	$2,917,529	$2,043,477		$3,273,078	$241,371	$3,514,449	$2,461,568
Year 12	2030		$2,850,613	$116,488	$2,967,101	$2,005,499		$3,324,406	$241,371	$3,565,777	$2,410,150
Year 13	2031		$2,900,185	$116,488	$3,016,673	$1,967,677		$3,375,733	$241,371	$3,617,104	$2,359,318
Year 14	2032		$2,949,757	$116,488	$3,066,245	$1,930,047		$3,427,060	$241,371	$3,668,431	$2,309,092
Year 15	2033		$2,999,329	$116,488	$3,115,817	$1,892,641		$3,478,388	$241,371	$3,719,759	$2,259,494
Year 16	2034		$3,048,901	$116,488	$3,165,389	$1,855,491		$3,529,715	$241,371	$3,771,086	$2,210,540
Year 17	2035		$3,098,473	$116,488	$3,214,961	$1,818,624		$3,581,043	$241,371	$3,822,413	$2,162,245
Year 18	2036		$3,148,045	$116,488	$3,264,533	$1,782,066		$3,632,370	$241,371	$3,873,741	$2,114,625
Year 19	2037		$3,197,617	$116,488	$3,314,105	$1,745,840		$3,683,697	$241,371	$3,925,068	$2,067,690
Year 20	2038		$3,247,189	$116,488	$3,363,677	$1,709,968		$3,735,025	$241,371	$3,976,396	$2,021,451
Salvage Value						$0					$0
Total						**$52,367,678**					**$71,058,195**

Alternative B2
Continued Lime Stabilization, Sludge Drying to 60% (Full Load, 24 Hrs)

Year #	Year	Capital Costs	O&M Costs	Replacement Fund	Annual Cost	PW
Year 1	2019	$15,584,175	$2,664,513	$181,442	$18,430,129	$18,430,129
Year 2	2020		$2,720,829	$181,442	$2,902,271	$2,800,744
Year 3	2021		$2,777,146	$181,442	$2,958,588	$2,755,215
Year 4	2022		$2,833,463	$181,442	$3,014,905	$2,709,443
Year 5	2023		$2,889,780	$181,442	$3,071,222	$2,663,502
Year 6	2024		$2,946,097	$181,442	$3,127,539	$2,617,460
Year 7	2025		$3,002,414	$181,442	$3,183,856	$2,571,379
Year 8	2026		$3,058,731	$181,442	$3,240,173	$2,525,319
Year 9	2027		$3,115,048	$181,442	$3,296,489	$2,479,336
Year 10	2028	$2,674,185	$3,171,365	$206,646	$6,052,195	$4,392,705
Year 11	2029		$3,224,103	$206,646	$3,430,749	$2,402,943
Year 12	2030		$3,276,842	$206,646	$3,483,487	$2,354,530
Year 13	2031		$3,329,580	$206,646	$3,536,226	$2,306,564
Year 14	2032		$3,382,319	$206,646	$3,588,964	$2,259,072
Year 15	2033		$3,435,057	$206,646	$3,641,703	$2,212,080
Year 16	2034		$3,487,796	$206,646	$3,694,441	$2,165,612
Year 17	2035		$3,540,534	$206,646	$3,747,180	$2,119,687
Year 18	2036		$3,593,273	$206,646	$3,799,918	$2,074,326
Year 19	2037		$3,646,011	$206,646	$3,852,657	$2,029,544
Year 20	2038		$3,698,750	$206,646	$3,905,395	$1,985,357
Salvage Value						$0
Total						**$65,854,947**

		Alternative C1 Remove Lime Stabilization, Sludge Drying to 90% (10 Hr Days)					Alternative C2 Remove Lime Stabilization, Sludge Drying to 90% (24 Hr Days)				
Year #	Year	Capital Costs	O&M Costs	Replacement Fund	Annual Cost	PW	Capital Costs	O&M Costs	Replacement Fund	Annual Cost	PW
Year 1	2019	$19,197,917	$2,378,307	$209,730	$21,785,954	$21,785,954	$18,612,711	$2,417,525	$205,414	$21,235,650	$21,235,650
Year 2	2020		$2,429,298	$209,730	$2,639,029	$2,546,710		$2,469,559	$205,414	$2,674,973	$2,581,398
Year 3	2021		$2,480,290	$209,730	$2,690,020	$2,505,108		$2,521,593	$205,414	$2,727,007	$2,539,552
Year 4	2022		$2,531,281	$209,730	$2,741,011	$2,463,299		$2,573,627	$205,414	$2,779,041	$2,497,476
Year 5	2023		$2,582,272	$209,730	$2,792,003	$2,421,350		$2,625,661	$205,414	$2,831,075	$2,455,235
Year 6	2024		$2,633,264	$209,730	$2,842,994	$2,379,322		$2,677,694	$205,414	$2,883,108	$2,412,894
Year 7	2025		$2,684,255	$209,730	$2,893,985	$2,337,271		$2,729,728	$205,414	$2,935,142	$2,370,510
Year 8	2026		$2,735,246	$209,730	$2,944,977	$2,295,250		$2,781,762	$205,414	$2,987,176	$2,328,139
Year 9	2027		$2,786,238	$209,730	$2,995,968	$2,253,309		$2,833,796	$205,414	$3,039,210	$2,285,832
Year 10	2028	$4,239,862	$2,837,229	$234,934	$7,312,026	$5,307,094	$2,389,130	$2,885,830	$230,618	$5,505,577	$3,995,968
Year 11	2029		$2,884,781	$234,934	$3,119,715	$2,185,091		$2,934,446	$230,618	$3,165,064	$2,216,854
Year 12	2030		$2,932,332	$234,934	$3,167,267	$2,140,793		$2,983,063	$230,618	$3,213,681	$2,172,165
Year 13	2031		$2,979,884	$234,934	$3,214,818	$2,096,920		$3,031,680	$230,618	$3,262,298	$2,127,889
Year 14	2032		$3,027,436	$234,934	$3,262,370	$2,053,498		$3,080,297	$230,618	$3,310,914	$2,084,054
Year 15	2033		$3,074,988	$234,934	$3,309,922	$2,010,547		$3,128,913	$230,618	$3,359,531	$2,040,681
Year 16	2034		$3,122,540	$234,934	$3,357,474	$1,968,088		$3,177,530	$230,618	$3,408,148	$1,997,792
Year 17	2035		$3,170,091	$234,934	$3,405,026	$1,926,139		$3,226,147	$230,618	$3,456,765	$1,955,407
Year 18	2036		$3,217,643	$234,934	$3,452,577	$1,884,717		$3,274,764	$230,618	$3,505,381	$1,913,542
Year 19	2037		$3,265,195	$234,934	$3,500,129	$1,843,836		$3,323,380	$230,618	$3,553,998	$1,872,214
Year 20	2038		$3,312,747	$234,934	$3,547,681	$1,803,509		$3,371,997	$230,618	$3,602,615	$1,831,435
Salvage Value						$0					$0
Total						**$66,207,806**					**$64,914,687**

		Alternative C1 - Bagging Remove Lime Stabilization, Sludge Drying to 90% (10 Hr Days)					Alternative C2 - Bagging Remove Lime Stabilization, Sludge Drying to 90% (24 Hr Days)				
Year #	Year	Capital Costs	O&M Costs	Replacement Fund	Annual Cost	PW	Capital Costs	O&M Costs	Replacement Fund	Annual Cost	PW
Year 1	2019	$17,053,320	$2,525,057	$200,460	$19,778,838	$19,778,838	$16,468,114	$2,564,276	$196,144	$19,228,534	$19,228,534
Year 2	2020		$2,578,028	$200,460	$2,778,488	$2,681,292		$2,618,289	$196,144	$2,814,433	$2,715,979
Year 3	2021		$2,630,999	$200,460	$2,831,460	$2,636,825		$2,672,303	$196,144	$2,868,447	$2,671,269
Year 4	2022		$2,683,971	$200,460	$2,884,431	$2,592,188		$2,726,317	$196,144	$2,922,460	$2,626,364
Year 5	2023		$2,736,942	$200,460	$2,937,402	$2,547,447		$2,780,330	$196,144	$2,976,474	$2,581,332
Year 6	2024		$2,789,913	$200,460	$2,990,373	$2,502,665		$2,834,344	$196,144	$3,030,487	$2,536,237
Year 7	2025		$2,842,884	$200,460	$3,043,344	$2,457,898		$2,888,357	$196,144	$3,084,501	$2,491,137
Year 8	2026		$2,895,855	$200,460	$3,096,315	$2,413,200		$2,942,371	$196,144	$3,138,514	$2,446,089
Year 9	2027		$2,948,826	$200,460	$3,149,286	$2,368,622		$2,996,384	$196,144	$3,192,528	$2,401,145
Year 10	2028	$4,239,862	$3,001,797	$225,664	$7,467,324	$5,419,810	$2,389,130	$3,050,398	$221,347	$5,660,875	$4,108,683
Year 11	2029		$3,051,520	$225,664	$3,277,184	$2,295,384		$3,101,186	$221,347	$3,322,533	$2,327,147
Year 12	2030		$3,101,243	$225,664	$3,326,907	$2,248,695		$3,151,973	$221,347	$3,373,321	$2,280,067
Year 13	2031		$3,150,965	$225,664	$3,376,629	$2,202,464		$3,202,761	$221,347	$3,424,109	$2,233,433
Year 14	2032		$3,200,688	$225,664	$3,426,352	$2,156,716		$3,253,549	$221,347	$3,474,896	$2,187,272
Year 15	2033		$3,250,411	$225,664	$3,476,075	$2,111,473		$3,304,336	$221,347	$3,525,684	$2,141,607
Year 16	2034		$3,300,134	$225,664	$3,525,798	$2,066,756		$3,355,124	$221,347	$3,576,472	$2,096,460
Year 17	2035		$3,349,856	$225,664	$3,575,520	$2,022,584		$3,405,912	$221,347	$3,627,259	$2,051,851
Year 18	2036		$3,399,579	$225,664	$3,625,243	$1,978,973		$3,456,699	$221,347	$3,678,047	$2,007,798
Year 19	2037		$3,449,302	$225,664	$3,674,966	$1,935,938		$3,507,487	$221,347	$3,728,835	$1,964,316
Year 20	2038		$3,499,024	$225,664	$3,724,688	$1,893,493		$3,558,275	$221,347	$3,779,622	$1,921,419
Salvage Value						$0					$0
Total						**$66,311,261**					**$65,018,141**

APPENDIX G

Design Data Models for Alternatives

West Central Wisconsin Biosolids Facility
Ellsworth, Wisconsin
Facilities Plan System Model
Alternative Summary

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
General Sludge Processing												
Incoming Sludge												
Volume	*gpd*			72,308	99,599	127,136	110,383	121,411	154,978	134,557	147,999	188,917
Solids Loading	*ppd*			15,475	21,067	27,494	21,886	25,681	33,515	26,679	31,305	40,855
Trucking Quantity												
Regular	*loads/day*			10	13	17	15	17	21	19	21	26
Road Restricted	*loads/day*			11	15	20	17	19	24	21	23	30
Raw Sludge Tanks												
Quantity in Use	#			2	2	2	4	4	4	4	4	4
Available Capacity	*gal*			64,498	37,207	9,670	52,452	41,193	7,150	27,987	14,263	-27,236
Sludge Pumping and Centrifuge												
Flow	*gpm*	300	200	145	166	212	186	205	262	227	250	319
Loading	*lbs/hr*	3,000	2,200	1,864	2,107	2,749	2,222	2,607	3,403	2,709	3,178	4,148
Bioset - Alt A												
Solids Feed												
Solids	*wet ton/hr*	8.2		4.2	4.6	6.1	4.9	5.7	7.5	6.0	7.0	9.1
Lime Feed	*lbs/day*			7,833	10,496	13,698	11,070	12,990	16,952	13,495	15,834	20,665
Bioset Pumping Rate (Alt 1 & 2)	*gpm*	42		18	20	26	21	25	33	26	31	40
Bioset Pumping Rate (Alt 3)	*gpm*			17	19	24	20	23	30	24	28	37
Lime Sludge Production												
Volume	*cy/yr*			10,299			13,232			16,129		
Solids	*wet ton/yr*			8,840			11,357			13,844		

West Central Wisconsin Biosolids Facility
Ellsworth, Wisconsin
Facilities Plan System Model
Alternative Summary

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Sludge Drying and Storage - Alt B												
Dryer Feed	*wet ton/hr*			4.7	5.2	6.8	5.5	7.2	8.4	6.7	8.8	10.2
Evaporation Rate	*ton/hr*			2.3	2.6	3.4	2.7	3.6	4.2	3.3	4.4	5.1
Dry Sludge Production												
Volume	*cy/yr*			5,055			6,526			7,955		
Solids	*wet ton/yr*			4,423			5,710			6,960		
Sludge Drying and Storage - Alt C												
Dryer Feed	*wet ton/hr*	0.0	0.0	4.2	4.6	6.1	4.9	5.7	7.5	6.0	7.0	9.1
Evaporation Rate	*ton/hr*	0.0	0.0	3.2	3.5	4.6	3.7	4.3	5.7	4.5	5.3	6.9
Dry Sludge Production												
Volume	*cy/yr*	0	0	2,299			2,954			3,601		
Solids	*wet ton/yr*	0	0	1,939			2,491			3,036		
Centrate Treatment/Storage												
Existing Storage	*gal*			136,806	136,806	136,806	0	0	0	0	0	0
Centrate Production	*gpd*			79,462	108,758	138,448	121,260	133,810	170,518	147,356	162,653	207,401
New Storage												
Diameter	*ft*			40	40	40	40	40	40	40	40	40
Depth	*ft*			22	22	22	22	22	22	22	22	22
Cone Depth	*ft*			5	5	5	5	5	5	5	5	5
Storage Volume	*gal*			0	0	0	169,194	169,194	169,194	169,194	169,194	169,194
Centrate Solids Treatment												
Volume	*gpd*			0.0	0.0	0.0	1,332.1	1,563.1	2,039.9	1,623.8	1,905.4	2,486.6
TS	*ppd*			0.0	0.0	0.0	333.3	391.1	510.4	406.3	476.7	622.2

West Central Wisconsin Biosolids Facility
Ellsworth, Wisconsin
Facilities Plan System Model
Alternative 1: Lime Only

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Influent Conditions												
Sludge												
Volume	*gal/year*						22,959,736			27,987,790		
	gal/week				448,196			546,349			665,996	
	gpd			72,308	99,599	127,136	110,383	121,411	154,978	134,557	147,999	188,917
Solids Loading	*lbs/year*						4,552,258			5,549,178		
	lbs/week				94,803			115,564			140,872	
	ppd			15,475	21,067	27,494	21,886	25,681	33,515	26,679	31,305	40,855
Recycle												
Volume	*gpd*			0	0	0	1,332	1,563	2,040	1,624	1,905	2,487
Solids Loading	*ppd*			0	0	0	333	391	510	406	477	622
Total												
Volume	*gpd*			72,308	99,599	127,136	111,716	122,974	157,018	136,181	149,905	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,219	26,072	34,025	27,085	31,782	41,477
Operations												
Work Week (Conveyor Starts)	*days*			4.40	4.50	4.50	4.00	4.50	4.50	4.00	4.50	4.50
Work Day (Sludge Pump Runtime)	*hrs*			8.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
	hrs/week			36.52	45.00	45.00	40.00	45.00	45.00	40.00	45.00	45.00

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Solids Unloading, Truck Handling, and Screening												
Total Sludge												
Volume	*gpd*			72,308	99,599	127,136	111,716	122,974	157,018	136,181	149,905	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,219	26,072	34,025	27,085	31,782	41,477
Scale	*qty*			1	1	1	1	1	1	1	1	1
Trucking Volume												
Regular Average	*gal/load*	7,000	7,138	7,138	7,138	7,138	7,138	7,138	7,138	7,138	7,138	7,138
	lbs/load	58,380	59,531	59,531	59,531	59,531	59,531	59,531	59,531	59,531	59,531	59,531
Road Restrictions	*gal/load*	6,000	6,338	6,338	6,338	6,338	6,338	6,338	6,338	6,338	6,338	6,338
	lbs/load	50,040	52,859	52,859	52,859	52,859	52,859	52,859	52,859	52,859	52,859	52,859
Trucking Quantity												
Regular	*loads/day*			10	13	17	15	17	21	19	21	26
Road Restricted	*loads/day*			11	15	20	17	19	24	21	23	30
Screening												
Number of Sludge Screens	*qty*			1	1	1	1	1	1	1	1	1
Screening Capacity	*gpm*	470		470	470	470	470	470	470	470	470	470
Unload Duration												
Hookup/Sign-in	*min*			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Unload												
Regular	*min*			15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Road Restrictions	*min*			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Load												
Centrate Pump Flow	*gpm*			500	500	500	500	500	500	500	500	500
Regular	*min*			14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3
Road Restrictions	*min*			12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
Unhook	*min*			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Load Duration												
Regular	*min*			39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5
Road Restrictions	*min*			36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2
Truck Load/Unload Duration												
Regular	*hrs/day/scale*			6.6	8.6	11.2	9.9	11.2	13.8	12.5	13.8	17.1
Road Restrictions	*hrs/day/scale*			6.6	9.0	12.1	10.2	11.5	14.5	12.7	13.9	18.1

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Raw Sludge Storage												
Total Sludge												
Volume	*gpd*			72,308	99,599	127,136	111,716	122,974	157,018	136,181	149,905	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,219	26,072	34,025	27,085	31,782	41,477
Raw Sludge Tanks												
Width	*ft*			16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
Length	*ft*			56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
SWD	*ft*			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Individual Volume	*gal*			68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403
Quantity in Use	#			2	2	2	4	4	4	4	4	4
Efficiency Rating	%			100%	100%	100%	60%	60%	60%	60%	60%	60%
Usable Tank Volume	*gal*			136,806	136,806	136,806	164,167	164,167	164,167	164,167	164,167	164,167
Available Capacity	*gal*			64,498	37,207	9,670	52,452	41,193	7,150	27,987	14,263	-27,236

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Sludge Pumping and Centrifuge												
Total Sludge												
Volume	*gpd*			72,308	99,599	127,136	111,716	122,974	157,018	136,181	149,905	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,219	26,072	34,025	27,085	31,782	41,477
Operations												
Work Week	*days*			4.4	4.5	4.5	4.0	4.5	4.5	4.0	4.5	4.5
Work Day	*hrs*			8.3	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pump/Centrifuge in Use	*qty*			1	1	1	1	1	1	1	1	1
Equipment Rating												
Flow	*gpm =>pump*	300	200	145	166	212	186	205	262	227	250	319
	gpm =>Cent	250	200									
	gpm =>Alfa	225	200									
Loading	*lbs/hr =>Cent*	3000	2200	1,864	2,107	2,749	2,222	2,607	3,403	2,709	3,178	4,148
	lbs/hr =>Alfa	2813	?									
Performance												
Feed Solids	*%*			2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%
Cake Solids	*%*			22.00%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%
Cake Density	*lbs/cf*			62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4
Capture Efficiency	*%*			98.55%	97%	97%	97%	97%	97%	97%	97%	97%
Cake Discharge												
Volume	*cf/day*			1,111	1,489	1,943	1,570	1,842	2,404	1,914	2,246	2,931
Solids	*dry ppd*			15,251	20,435	26,669	21,553	25,290	33,005	26,272	30,828	40,233
	wet ppd			69,321	92,888	121,224	97,966	114,954	150,021	119,420	140,128	182,877
	wet ton/day			34.7	46.4	60.6	49.0	57.5	75.0	59.7	70.1	91.4
	wet ton/hr			4.2	4.6	6.1	4.9	5.7	7.5	6.0	7.0	9.1

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Water Additions												
Startup/Plug												
Duration	*min*			15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Rate	*gpm*			60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Volume	*gpd*			900	900	900	900	900	900	900	900	900
Solids	*ppd*			1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Polymer												
Feed Rate	*lbs/dt*			30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8
Neat Concentration	*%*			42%	42%	42%	42%	42%	42%	42%	42%	42%
Polymer Density	*lbs/gal*			8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
Make-Up Concentration	*%*			0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Volume	*gpd*			13,364	18,193	23,743	19,188	22,515	29,384	23,390	27,446	35,819
CIP/Wash												
Duration	*min*			20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Rate	*gpm*			60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Volume	*gpd*			1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Solids	*ppd*			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Centrate												
Volume	*gpd*			63,998	88,464	112,605	99,972	109,194	139,035	121,865	133,107	169,482
Solids	*ppd*			212	620	813	655	770	1,009	801	942	1,232
Total Centrate												
Volume	*gpd*			79,462	108,758	138,448	121,260	133,810	170,518	147,356	162,653	207,401
Solids	*ppd*			224	632	825	667	782	1,021	813	953	1,244
Trucking Check												
Regular	*gal/truck*			7,946	8,366	8,144	8,084	7,871	8,120	7,756	7,745	7,977
Road Restrictions	*gal/truck*			7,224	7,251	6,922	7,133	7,043	7,105	7,017	7,072	6,913

				Current				2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Bioset Lime												
Solids Feed												
Volume	*cf/day*			1,111	1,489	1,943	1,570	1,842	2,404	1,914	2,246	2,931
Solids	*dry ppd*			15,251	20,435	26,669	21,553	25,290	33,005	26,272	30,828	40,233
	dry lbs/hr			1,837	2,044	2,667	2,155	2,529	3,300	2,627	3,083	4,023
	wet ppd			69,321	92,888	121,224	97,966	114,954	150,021	119,420	140,128	182,877
	wet lbs/hr	16,429		8,352	9,289	12,122	9,797	11,495	15,002	11,942	14,013	18,288
	wet ton/day			34.7	46.4	60.6	49.0	57.5	75.0	59.7	70.1	91.4
	wet ton/hr			4.2	4.6	6.1	4.9	5.7	7.5	6.0	7.0	9.1
Temperature												
Feed Cake	*deg F*			55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Final	*deg F*			135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0
IS LIME SYSTEM BEING USED	*Yes/No*			yes	yes	yes	yes	yes	yes	yes	yes	yes
Lime												
Dosage - wet basis	*% wet solids*			11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%
CaO Content	*%*			93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%
Heat Capacity of Lime	*btu/lb*			600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0
Lime Density	*lbs/cf*			75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Sulfamic Acid												
Dosage - dry basis	*% dry solids*			0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%
Equivalent CaO Content	*%*			131.0%	131.0%	131.0%	131.0%	131.0%	131.0%	131.0%	131.0%	131.0%
Operations												
Work Week	*days*			4.40	4.50	4.50	4.00	4.50	4.50	4.00	4.50	4.50
Work Day	*hrs*			8.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Lime Addition	*lbs/hr*			944	1,050	1,370	1,107	1,299	1,695	1,349	1,583	2,067
	lbs/min	57		15.73	17	23	18	22	28	22	26	34
	cf/hr			13	14	18	15	17	23	18	21	28
	lbs/day			7,833	10,496	13,698	11,070	12,990	16,952	13,495	15,834	20,665
Dry Ratio	*%*			51%	51%	51%	51%	51%	51%	51%	51%	51%
Sulfamic Acid Addition	*lbs/day*			14	15	20	16	19	25	20	23	30
Heat												
Sludge Requirement	*btu/hr*			588,239	654,224	853,797	689,993	809,637	1,056,622	841,097	986,944	1,288,029
From Lime	*btu/hr*			526,622	585,695	764,363	617,717	724,829	945,942	752,994	883,564	1,153,110
From Sulfamic Acid	*btu/hr*			1,305	1,205	1,572	1,271	1,491	1,946	1,549	1,817	2,372
Deficit (surplus)	*btu/hr*			(60,312)	(67,324)	(87,862)	(71,005)	(83,317)	(108,734)	(86,555)	(101,564)	(132,547)

				Current				2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Cake Sludge												
Volume	*cf/hr*			146	163	213	172	202	263	209	246	321
	gpm	42		18	20	26	21	25	33	26	31	40
	cf/day			1,215	1,629	2,125	1,718	2,015	2,630	2,094	2,457	3,206
Solids	*dry lbs/hr*			2,795	3,108	4,057	3,278	3,847	5,020	3,996	4,689	6,120
	dry ppd			23,198	31,085	40,567	32,784	38,469	50,205	39,964	46,894	61,200
	wet lbs/hr			9,309	10,354	13,512	10,920	12,813	16,722	13,311	15,619	20,384
	wet ppd			77,269	103,537	135,122	109,198	128,133	167,221	133,112	156,194	203,843
	wet ton/hr			4.7	5.2	6.8	5.5	6.4	8.4	6.7	7.8	10.2
	wet ton/day			38.6	51.8	67.6	54.6	64.1	83.6	66.6	78.1	101.9
	%			30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Temperature	*deg F*			127	127	127	127	127	127	127	127	127
	deg C			53	53	53	53	53	53	53	53	53
Reactor												
Length	*ft*			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Diameter	*ft*			25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Volume	*cf*			314	314	314	314	314	314	314	314	314
Detention Time	*min*	60		129	116	89	110	94	72	90	77	59
Lime Silo												
Quantity	#	2		2	2	2	2	2	2	2	2	2
Silo Volume	*cf*	2100		2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Lime Storage Volume	*cf*			4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200
Lime Storage	*weeks*			9.1	6.7	5.1	7.1	5.4	4.1	5.8	4.4	3.4

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Sludge Drying												
Cake Sludge												
Volume	*cf/hr*			146	163	213	172	202	263	209	246	321
	gpm			18	20	26	21	25	33	26	31	40
	cf/day			1,215	1,629	2,125	1,718	2,015	2,630	2,094	2,457	3,206
Solids	*dry lbs/hr*			2,795	3,108	4,057	3,278	3,847	5,020	3,996	4,689	6,120
	dry ppd			23,198	31,085	40,567	32,784	38,469	50,205	39,964	46,894	61,200
	wet lbs/hr			9,309	10,354	13,512	10,920	12,813	16,722	13,311	15,619	20,384
	wet ppd			77,269	103,537	135,122	109,198	128,133	167,221	133,112	156,194	203,843
	wet ton/hr			4.7	5.2	6.8	5.5	6.4	8.4	6.7	7.8	10.2
	wet ton/day			38.6	51.8	67.6	54.6	64.1	83.6	66.6	78.1	101.9
	%			30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Temperature	*deg F*			127	127	127	127	127	127	127	127	127
	deg C			53	53	53	53	53	53	53	53	53
IS DRYER BEING USED	*Yes/No*			no	no	no	no	no	no	no	no	no
Operations												
Work Week	*days*			4.40	4.50	4.50	4.00	4.50	4.50	4.00	4.50	4.50
Work Day	*hrs*			8.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Target Dried Solids	*%*			30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Reactor Feed												
Volume	*cf/hr*			146.4	162.9	212.5	171.8	201.5	263.0	209.4	245.7	320.6
Solids	*dry ton/hr*			1.4	1.6	2.0	1.6	1.9	2.5	2.0	2.3	3.1
	wet ton/hr			4.7	5.2	6.8	5.5	6.4	8.4	6.7	7.8	10.2
Sludge Discharge												
Volume	*cf/hr*			146.4	162.9	212.5	171.8	201.5	263.0	209.4	245.7	320.6
	cf/day			1,215	1,629	2,125	1,718	2,015	2,630	2,094	2,457	3,206
	cf/yr			278,074	381,078	497,327	357,256	471,605	615,470	435,493	574,884	750,262
	cy/yr			10,299	14,114	18,420	13,232	17,467	22,795	16,129	21,292	27,787
Solids	*dry ppd*			23,198	31,085	40,567	32,784	38,469	50,205	39,964	46,894	61,200
	dry ton/yr			2,654	3,637	4,746	3,410	4,501	5,874	4,156	5,487	7,160
	wet ppd			77,269	103,537	135,122	109,198	128,133	167,221	133,112	156,194	203,843
	wet ton/yr			8,840	12,114	15,809	11,357	14,992	19,565	13,844	18,275	23,850
Evaporate												
Volume	*gpd*			0	0	0	0	0	0	0	0	0
	lbs/day			0	0	0	0	0	0	0	0	0
	ton/day			0	0	0	0	0	0	0	0	0
	ton/hr			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Class A Sludge Storage												
Cake Sludge												
Volume	*cf/hr*			146.4	162.9	212.5	171.8	201.5	263.0	209.4	245.7	320.6
	cf/day			1,215	1,629	2,125	1,718	2,015	2,630	2,094	2,457	3,206
	cf/yr			278,074	381,078	497,327	357,256	471,605	615,470	435,493	574,884	750,262
	cy/yr			10,299	14,114	18,420	13,232	17,467	22,795	16,129	21,292	27,787
Solids	*dry ppd*			23,198	31,085	40,567	32,784	38,469	50,205	39,964	46,894	61,200
	dry ton/yr			2,654	3,637	4,746	3,410	4,501	5,874	4,156	5,487	7,160
	wet ppd			77,269	103,537	135,122	109,198	128,133	167,221	133,112	156,194	203,843
	wet ton/yr			8,840	12,114	15,809	11,357	14,992	19,565	13,844	18,275	23,850
Existing Storage Structure												
Effective Width	*ft*			115	115	115	115	115	115	115	115	115
Effective Length	*ft*			220	220	220	220	220	220	220	220	220
Stack Height	*ft*			8	8	8	8	8	8	8	8	8
Storage Capacity	*cy*			7,496	7,496	7,496	7,496	7,496	7,496	7,496	7,496	7,496
Storage	*days*			266	194	149	207	157	120	170	129	98
Additional Storage Required (180 days min)	*cy*			0			0			568		
Area Required	*sq ft*			0			0			1,918		

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Centrate Treatment												
Centrate												
Volume	*gpd*			79,462	108,758	138,448	121,260	133,810	170,518	147,356	162,653	207,401
Solids	*ppd*			224	632	825	667	782	1,021	813	953	1,244
Existing Storage												
Width	*ft*			16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
Length	*ft*			56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
Effective Depth	*ft*			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Individual Volume	*gal*			68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403
Quantity in Use	#			2	2	2	0	0	0	0	0	0
Total Tank Volume	*gal*			136,806	136,806	136,806	0	0	0	0	0	0
New Storage												
In Use?				no	no	no	yes	yes	yes	yes	yes	yes
Diameter	*ft*			40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Area	*sf*			0.0	0.0	0.0	1,256.6	1,256.6	1,256.6	1,256.6	1,256.6	1,256.6
Clarifier												
Cone Depth	*ft*			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SWD	*ft*			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Volume	*gal*			0.0	0.0	0.0	34,465.4	34,465.4	34,465.4	34,465.4	34,465.4	34,465.4
Storage												
SWD				18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Volume				0	0	0	169,194	169,194	169,194	169,194	169,194	169,194
Total Storage Volume	*gal*			136,806	136,806	136,806	169,194	169,194	169,194	169,194	169,194	169,194
Centrate Solids Treatment												
Overflow Rate	*gpd/sf*			#DIV/0!	#DIV/0!	#DIV/0!	96.5	106.5	135.7	117.3	129.4	165.0
Detention Time	*operating day*			#DIV/0!	#DIV/0!	#DIV/0!	25.9	22.0	16.9	21.2	18.1	13.9
Removal Efficiency	*%*			50%	50%	50%	50%	50%	50%	50%	50%	50%
Sludge Concentration	*%*			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Sludge Recycle												
Volume	*gpd*			0.0	0.0	0.0	1,332.1	1,563.1	2,039.9	1,623.8	1,905.4	2,486.6
TS	*ppd*			0.0	0.0	0.0	333.3	391.1	510.4	406.3	476.7	622.2
Centrate												
Volume	*gpd*			79,462	108,758	138,448	119,928	132,247	168,479	145,732	160,748	204,914
Solids	*ppd*			224.4	632.0	824.8	333.3	391.1	510.4	406.3	476.7	622.2
Storage Surplus (Deficit)	*gpd*			57,344	28,048	(1,642)	49,265	36,947	715	23,462	8,446	(35,721)

West Central Wisconsin Biosolids Facility
Ellsworth, Wisconsin
Facilities Plan System Model
Alternative 2: Lime and Drying

					Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Influent Conditions												
Sludge												
Volume	*gal/year*						22,959,736			27,987,790		
	gal/week				448,196			546,349			665,996	
	gpd			72,308	99,599	127,136	110,383	136,587	154,978	134,557	166,499	188,917
Solids Loading	*lbs/year*						4,552,258			5,549,178		
	lbs/week				94,803			115,564			140,872	
	ppd			15,475	21,067	27,494	21,886	28,891	33,515	26,679	35,218	40,855
Recycle												
Volume	*gpd*			0	0	0	1,758	1,758	2,040	2,144	2,144	2,487
Solids Loading	*ppd*			0	0	0	440	440	510	536	536	622
Total												
Volume	*gpd*			72,308	99,599	127,136	112,142	138,346	157,018	136,700	168,643	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,326	29,331	34,025	27,215	35,754	41,477
Operations												
Work Week (Conveyor Starts)	*days*			4.40	4.50	4.50	4.00	4.00	4.00	4.00	4.00	4.00
Work Day (Sludge Pump Runtime)	*hrs*			8.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
	hrs/week			36.52	45.00	45.00	40.00	40.00	40.00	40.00	40.00	40.00

				Current				2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Solids Unloading, Truck Handling, and Screening												
Total Sludge												
Volume	*gpd*			72,308	99,599	127,136	112,142	138,346	157,018	136,700	168,643	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,326	29,331	34,025	27,215	35,754	41,477
Scale	*qty*			1	1	1	1	1	1	1	1	1
Trucking Volume												
Regular Average	*gal/load*	7,000	7,138	7,138	7,138	7,138	7,138	7,138	7,138	7,138	7,138	7,138
	lbs/load	58,380	59,531	59,531	59,531	59,531	59,531	59,531	59,531	59,531	59,531	59,531
Road Restrictions	*gal/load*	6,000	6,338	6,338	6,338	6,338	6,338	6,338	6,338	6,338	6,338	6,338
	lbs/load	50,040	52,859	52,859	52,859	52,859	52,859	52,859	52,859	52,859	52,859	52,859
Trucking Quantity												
Regular	*loads/day*			10	13	17	15	19	21	19	23	26
Road Restricted	*loads/day*			11	15	20	17	21	24	21	26	30
Screening												
Number of Sludge Screens	*qty*			1	1	1	1	1	1	1	1	1
Screening Capacity	*gpm*	470		470	470	470	470	470	470	470	470	470
Unload Duration												
Hookup/Sign-in	*min*			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Unload												
Regular	*min*			15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Road Restrictions	*min*			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Load												
Centrate Pump Flow	*gpm*			500	500	500	500	500	500	500	500	500
Regular	*min*			14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3
Road Restrictions	*min*			12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
Unhook	*min*			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Load Duration												
Regular	*min*			39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5
Road Restrictions	*min*			36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2
Truck Load/Unload Duration												
Regular	*hrs/day/scale*			6.6	8.6	11.2	9.9	12.5	13.8	12.5	15.1	17.1
Road Restrictions	*hrs/day/scale*			6.6	9.0	12.1	10.2	12.7	14.5	12.7	15.7	18.1

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Raw Sludge Storage												
Total Sludge												
Volume	*gpd*			72,308	99,599	127,136	112,142	138,346	157,018	136,700	168,643	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,326	29,331	34,025	27,215	35,754	41,477
Raw Sludge Tanks												
Width	*ft*			16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
Length	*ft*			56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
SWD	*ft*			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Individual Volume	*gal*			68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403
Quantity in Use	#			2	3	3	4	4	4	4	4	4
Efficiency Rating	%			60%	60%	60%	60%	60%	60%	60%	60%	60%
Usable Tank Volume	*gal*			82,084	123,126	123,126	164,167	164,167	164,167	164,167	164,167	164,167
Available Capacity	*gal*			9,776	23,526	-4,010	52,026	25,822	7,150	27,467	-4,475	-27,236

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Sludge Pumping and Centrifuge												
Total Sludge												
Volume	*gpd*			72,308	99,599	127,136	112,142	138,346	157,018	136,700	168,643	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,326	29,331	34,025	27,215	35,754	41,477
Operations												
Work Week	*days*			4.4	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Work Day	*hrs*			8.3	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pump/Centrifuge in Use	*qty*			1	1	1	1	1	1	1	1	1
Equipment Rating												
Flow	*gpm =>pump*	300	200	145	166	212	187	231	262	228	281	319
	gpm =>Cent	250	200									
	gpm =>Alfa	225	200									
Loading	*lbs/hr =>Cent*	3000	2200	1,864	2,107	2,749	2,233	2,933	3,403	2,722	3,575	4,148
	lbs/hr =>Alfa	2813	?									
Performance												
Feed Solids	*%*			2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%
Cake Solids	*%*			22.00%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%
Cake Density	*lbs/cf*			62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4
Capture Efficiency	*%*			98.55%	97%	97%	97%	97%	97%	97%	97%	97%
Cake Discharge												
Volume	*cf/day*			1,111	1,489	1,943	1,578	2,072	2,404	1,923	2,526	2,931
Solids	*dry ppd*			15,251	20,435	26,669	21,656	28,451	33,005	26,399	34,682	40,233
	wet ppd			69,321	92,888	121,224	98,437	129,323	150,021	119,994	157,644	182,877
	wet ton/day			34.7	46.4	60.6	49.2	64.7	75.0	60.0	78.8	91.4
	wet ton/hr			4.2	4.6	6.1	4.9	6.5	7.5	6.0	7.9	9.1

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Water Additions												
Startup/Plug												
Duration	*min*			15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Rate	*gpm*			60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Volume	*gpd*			900	900	900	900	900	900	900	900	900
Solids	*ppd*			1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Polymer												
Feed Rate	*lbs/dt*			30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8
Neat Concentration	*%*			42%	42%	42%	42%	42%	42%	42%	42%	42%
Polymer Density	*lbs/gal*			8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
Make-Up Concentration	*%*			0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Volume	*gpd*			13,364	18,193	23,743	19,280	25,330	29,384	23,503	30,877	35,819
CIP/Wash												
Duration	*min*			20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Rate	*gpm*			60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Volume	*gpd*			1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Solids	*ppd*			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Centrate												
Volume	*gpd*			63,998	88,464	112,605	100,342	122,844	139,035	122,316	149,745	169,482
Solids	*ppd*			212	620	813	658	868	1,009	805	1,061	1,232
Total Centrate												
Volume	*gpd*			79,462	108,758	138,448	121,722	150,273	170,518	147,919	182,722	207,401
Solids	*ppd*			224	632	825	670	880	1,021	816	1,073	1,244
Trucking Check												
Regular	*gal/truck*			7,946	8,366	8,144	8,115	7,909	8,120	7,785	7,944	7,977
Road Restrictions	*gal/truck*			7,224	7,251	6,922	7,160	7,156	7,105	7,044	7,028	6,913

				Current				2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Bioset Lime												
Solids Feed												
Volume	*cf/day*			1,111	1,489	1,943	1,578	2,072	2,404	1,923	2,526	2,931
Solids	*dry ppd*			15,251	20,435	26,669	21,656	28,451	33,005	26,399	34,682	40,233
	dry lbs/hr			1,837	2,044	2,667	2,166	2,845	3,300	2,640	3,468	4,023
	wet ppd			69,321	92,888	121,224	98,437	129,323	150,021	119,994	157,644	182,877
	wet lbs/hr	16,429		8,352	9,289	12,122	9,844	12,932	15,002	11,999	15,764	18,288
	wet ton/day			34.7	46.4	60.6	49.2	64.7	75.0	60.0	78.8	91.4
	wet ton/hr			4.2	4.6	6.1	4.9	6.5	7.5	6.0	7.9	9.1
Temperature												
Feed Cake	*deg F*			55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Final	*deg F*			135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0
IS LIME SYSTEM BEING USED	*Yes/No*			yes	yes	yes	yes	yes	yes	yes	yes	yes
Lime												
Dosage - wet basis	*% wet solids*			11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%
CaO Content	*%*			93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%
Heat Capacity of Lime	*btu/lb*			600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0
Lime Density	*lbs/cf*			75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Sulfamic Acid												
Dosage - dry basis	*% dry solids*			0.75%	0.75%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Equivalent CaO Content	*%*			131.0%	131.0%	131.0%	131.0%	131.0%	131.0%	131.0%	131.0%	131.0%
Operations												
Work Week	*days*			4.40	4.50	4.50	4.00	4.00	4.00	4.00	4.00	4.00
Work Day	*hrs*			8.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Lime Addition	*lbs/hr*		1330	944	1,050	1,370	1,112	1,461	1,695	1,356	1,781	2,067
	lbs/min	57		15.73	17	23	19	24	28	23	30	34
	cf/hr			13	14	18	15	19	23	18	24	28
	lbs/day			7,833	10,496	13,698	11,123	14,613	16,952	13,559	17,814	20,665
Dry Ratio	*%*			51%	51%	51%	51%	51%	51%	51%	51%	51%
Sulfamic Acid Addition	*lbs/day*			14	15	20	16	21	25	20	26	30
Heat												
Sludge Requirement	*btu/hr*			588,239	654,224	853,797	693,305	910,842	1,056,622	845,135	1,110,312	1,288,029
From Lime	*btu/hr*			526,622	585,695	764,363	620,682	815,433	945,942	756,608	994,009	1,153,110
From Sulfamic Acid	*btu/hr*			1,305	1,205	1,572	1,277	1,677	1,946	1,556	2,044	2,372
Deficit (surplus)	*btu/hr*			(60,312)	(67,324)	(87,862)	(71,346)	(93,732)	(108,734)	(86,970)	(114,259)	(132,547)

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Cake Sludge												
Volume	*cf/hr*			146	163	213	173	227	263	210	276	321
	gpm	42		18	20	26	22	28	33	26	34	40
	cf/day			1,215	1,629	2,125	1,726	2,267	2,630	2,104	2,764	3,206
Solids	*dry lbs/hr*			2,795	3,108	4,057	3,294	4,328	5,020	4,016	5,276	6,120
	dry ppd			23,198	31,085	40,567	32,942	43,278	50,205	40,156	52,756	61,200
	wet lbs/hr			9,309	10,354	13,512	10,972	14,415	16,722	13,375	17,572	20,384
	wet ppd			77,269	103,537	135,122	109,722	144,150	167,221	133,751	175,718	203,843
	wet ton/hr			4.7	5.2	6.8	5.5	7.2	8.4	6.7	8.8	10.2
	wet ton/day			38.6	51.8	67.6	54.9	72.1	83.6	66.9	87.9	101.9
	%			30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Temperature	*deg F*			127	127	127	127	127	127	127	127	127
	deg C			53	53	53	53	53	53	53	53	53
Reactor												
Length	*ft*			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Diameter	*ft*			25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Volume	*cf*			314	314	314	314	314	314	314	314	314
Detention Time	*min*	60		129	116	89	109	83	72	90	68	59
Lime Silo												
Quantity	#	2		2	2	2	2	2	2	2	2	2
Silo Volume	*cf*	2100		2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Lime Storage Volume	*cf*			4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200
Lime Storage	*weeks*			9.1	6.7	5.1	7.1	5.4	4.6	5.8	4.4	3.8

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Sludge Drying												
Cake Sludge												
Volume	*cf/hr*			146	163	213	173	227	263	210	276	321
	gpm			18	20	26	22	28	33	26	34	40
	cf/day			1,215	1,629	2,125	1,726	2,267	2,630	2,104	2,764	3,206
Solids	*dry lbs/hr*			2,795	3,108	4,057	3,294	4,328	5,020	4,016	5,276	6,120
	dry ppd			23,198	31,085	40,567	32,942	43,278	50,205	40,156	52,756	61,200
	wet lbs/hr			9,309	10,354	13,512	10,972	14,415	16,722	13,375	17,572	20,384
	wet ppd			77,269	103,537	135,122	109,722	144,150	167,221	133,751	175,718	203,843
	wet ton/hr			4.7	5.2	6.8	5.5	7.2	8.4	6.7	8.8	10.2
	wet ton/day			38.6	51.8	67.6	54.9	72.1	83.6	66.9	87.9	101.9
	%			30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Temperature	*deg F*			127	127	127	127	127	127	127	127	127
	deg C			53	53	53	53	53	53	53	53	53
IS DRYER BEING USED	*Yes/No*			yes	yes	yes	yes	yes	yes	yes	yes	yes
Operations												
Work Week	*days*			4.40	4.50	4.50	4.00	4.00	4.00	4.00	4.00	4.00
Work Day	*hrs*			8.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Target Dried Solids	*%*			60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Reactor Feed												
Volume	*cf/hr*			146.4	162.9	212.5	172.6	226.7	263.0	210.4	276.4	320.6
Solids	*dry ton/hr*			1.4	1.6	2.0	1.6	2.2	2.5	2.0	2.6	3.1
	wet ton/hr			4.7	5.2	6.8	5.5	7.2	8.4	6.7	8.8	10.2
Sludge Discharge												
Volume	*cf/hr*			71.9	79.9	104.3	84.7	111.3	129.1	103.3	135.7	157.4
	cf/day			597	799	1,043	847	1,113	1,291	1,033	1,357	1,574
	cf/yr			136,484	187,041	244,098	176,190	231,473	268,521	214,775	282,165	327,328
	cy/yr			5,055	6,927	9,041	6,526	8,573	9,945	7,955	10,451	12,123
Solids	*dry ppd*			23,198	31,085	40,567	32,942	43,278	50,205	40,156	52,756	61,200
	dry ton/yr			2,654	3,637	4,746	3,426	4,501	5,221	4,176	5,487	6,365
	wet ppd			38,664	51,808	67,612	54,903	72,130	83,674	66,926	87,926	101,999
	wet ton/yr			4,423	6,062	7,911	5,710	7,502	8,702	6,960	9,144	10,608
Evaporate												
Volume	*gpd*			4,629	6,203	8,095	6,573	8,635	10,018	8,013	10,527	12,212
	lbs/day			38,605	51,729	67,509	54,819	72,020	83,547	66,824	87,792	101,844
	ton/day			19	26	34	27	36	42	33	44	51
	ton/hr			2.3	2.6	3.4	2.7	3.6	4.2	3.3	4.4	5.1

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Class A Sludge Storage												
Cake Sludge												
Volume	*cf/hr*			71.9	79.9	104.3	84.7	111.3	129.1	103.3	135.7	157.4
	cf/day			597	799	1,043	847	1,113	1,291	1,033	1,357	1,574
	cf/yr			136,484	187,041	244,098	176,190	231,473	268,521	214,775	282,165	327,328
	cy/yr			5,055	6,927	9,041	6,526	8,573	9,945	7,955	10,451	12,123
Solids	*dry ppd*			23,198	31,085	40,567	32,942	43,278	50,205	40,156	52,756	61,200
	dry ton/yr			2,654	3,637	4,746	3,426	4,501	5,221	4,176	5,487	6,365
	wet ppd			38,664	51,808	67,612	54,903	72,130	83,674	66,926	87,926	101,999
	wet ton/yr			4,423	6,062	7,911	5,710	7,502	8,702	6,960	9,144	10,608
Existing Storage Structure												
Effective Width	*ft*			115	115	115	115	115	115	115	115	115
Effective Length	*ft*			220	220	220	220	220	220	220	220	220
Stack Height	*ft*			8	8	8	8	8	8	8	8	8
Storage Capacity	*cy*			7,496	7,496	7,496	7,496	7,496	7,496	7,496	7,496	7,496
Storage	*days*			541	395	303	419	319	275	344	262	226
Additional Storage Required (180 days min)	*cy*			0			0			0		
Area Required	*sq ft*			0			0			0		

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Centrate Treatment												
Centrate												
Volume	*gpd*			79,465	108,761	138,452	121,725	150,277	170,523	147,922	182,727	207,406
Solids	*ppd*			224	632	825	670	880	1,021	816	1,073	1,244
Existing Storage												
Width	*ft*			16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
Length	*ft*			56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
Effective Depth	*ft*			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Individual Volume	*gal*			68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403
Quantity in Use	#			2	1	1	0	0	0	0	0	0
Total Tank Volume	*gal*			136,806	68,403	68,403	0	0	0	0	0	0
New Storage												
In Use?				no	no	no	yes	yes	yes	yes	yes	yes
Diameter	*ft*			42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
Area	*sf*			0.0	0.0	0.0	1,385.4	1,385.4	1,385.4	1,385.4	1,385.4	1,385.4
Clarifier												
Cone Depth	*ft*			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SWD	*ft*			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Volume	*gal*			0.0	0.0	0.0	37,998.1	37,998.1	37,998.1	37,998.1	37,998.1	37,998.1
Storage												
SWD				18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Volume				0	0	0	186,536	186,536	186,536	186,536	186,536	186,536
Total Storage Volume	*gal*			136,806	68,403	68,403	186,536	186,536	186,536	186,536	186,536	186,536
Centrate Solids Treatment												
Overflow Rate	*gpd/sf*			#DIV/0!	#DIV/0!	#DIV/0!	87.9	108.5	123.1	106.8	131.9	149.7
Detention Time	*operating day*			#DIV/0!	#DIV/0!	#DIV/0!	28.4	21.6	18.6	23.3	17.7	15.3
Removal Efficiency	*%*			50%	50%	50%	50%	50%	50%	50%	50%	50%
Sludge Concentration	*%*			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Sludge Recycle												
Volume	*gpd*			0.0	0.0	0.0	1,338.5	1,758.5	2,039.9	1,631.6	2,143.5	2,486.6
TS	*ppd*			0.0	0.0	0.0	334.9	440.0	510.4	408.2	536.3	622.2
Centrate												
Volume	*gpd*			79,465	108,761	138,452	120,387	148,518	168,483	146,291	180,583	204,919
Solids	*ppd*			224.4	632.0	824.8	334.9	440.0	510.4	408.2	536.3	622.2
Storage Surplus (Deficit)	*gpd*			57,342	(40,357)	(70,048)	66,149	38,017	18,053	40,245	5,953	(18,383)

West Central Wisconsin Biosolids Facility
Ellsworth, Wisconsin
Facilities Plan System Model
Alternative 3: Drying Only

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Influent Conditions												
Sludge												
Volume	*gal/year*						22,959,736			27,987,790		
	gal/week				448,196			546,349			665,996	
	gpd			72,308	99,599	127,136	110,383	121,411	154,978	134,557	147,999	188,917
Solids Loading	*lbs/year*						4,552,258			5,549,178		
	lbs/week				94,803			115,564			140,872	
	ppd			15,475	21,067	27,494	21,886	25,681	33,515	26,679	31,305	40,855
Recycle												
Volume	*gpd*			0	0	0	1,332	1,563	2,040	1,624	1,905	2,487
Solids Loading	*ppd*			0	0	0	333	391	510	406	477	622
Total												
Volume	*gpd*			72,308	99,599	127,136	111,716	122,974	157,018	136,181	149,905	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,219	26,072	34,025	27,085	31,782	41,477
Operations												
Work Week (Conveyor Starts)	*days*			4.40	4.50	4.50	4.00	4.50	4.50	4.00	4.50	4.50
Work Day (Sludge Pump Runtime)	*hrs*			8.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
	hrs/week			36.52	45.00	45.00	40.00	45.00	45.00	40.00	45.00	45.00

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Solids Unloading, Truck Handling, and Screening												
Total Sludge												
Volume	*gpd*			72,308	99,599	127,136	111,716	122,974	157,018	136,181	149,905	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,219	26,072	34,025	27,085	31,782	41,477
Scale	*qty*			1	1	1	1	1	1	1	1	1
Trucking Volume												
Regular Average	*gal/load*	7,000	7,138	7,138	7,138	7,138	7,138	7,138	7,138	7,138	7,138	7,138
	lbs/load	58,380	59,531	59,531	59,531	59,531	59,531	59,531	59,531	59,531	59,531	59,531
Road Restrictions	*gal/load*	6,000	6,338	6,338	6,338	6,338	6,338	6,338	6,338	6,338	6,338	6,338
	lbs/load	50,040	52,859	52,859	52,859	52,859	52,859	52,859	52,859	52,859	52,859	52,859
Trucking Quantity												
Regular	*loads/day*			10	13	17	15	17	21	19	21	26
Road Restricted	*loads/day*			11	15	20	17	19	24	21	23	30
Screening												
Number of Sludge Screens	*qty*			1	1	1	1	1	1	1	1	1
Screening Capacity	*gpm*	470		470	470	470	470	470	470	470	470	470
Unload Duration												
Hookup/Sign-in	*min*			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Unload												
Regular	*min*			15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Road Restrictions	*min*			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Load												
Centrate Pump Flow	*gpm*			500	500	500	500	500	500	500	500	500
Regular	*min*			14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3
Road Restrictions	*min*			12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
Unhook	*min*			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Load Duration												
Regular	*min*			39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5
Road Restrictions	*min*			36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2	36.2
Truck Load/Unload Duration												
Regular	*hrs/day/scale*			6.6	8.6	11.2	9.9	11.2	13.8	12.5	13.8	17.1
Road Restrictions	*hrs/day/scale*			6.6	9.0	12.1	10.2	11.5	14.5	12.7	13.9	18.1

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Raw Sludge Storage												
Total Sludge												
Volume	*gpd*			72,308	99,599	127,136	111,716	122,974	157,018	136,181	149,905	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,219	26,072	34,025	27,085	31,782	41,477
Raw Sludge Tanks												
Width	*ft*			16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
Length	*ft*			56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
SWD	*ft*			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Individual Volume	*gal*			68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403
Quantity in Use	#			2	3	3	4	4	4	4	4	4
Efficiency Rating	%			60%	60%	60%	60%	60%	60%	60%	60%	60%
Usable Tank Volume	*gal*			82,084	123,126	123,126	164,167	164,167	164,167	164,167	164,167	164,167
Available Capacity	*gal*			9,776	23,526	-4,010	52,452	41,193	7,150	27,987	14,263	-27,236

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Sludge Pumping and Centrifuge												
Total Sludge												
Volume	*gpd*			72,308	99,599	127,136	111,716	122,974	157,018	136,181	149,905	191,404
Solids Loading	*ppd*			15,475	21,067	27,494	22,219	26,072	34,025	27,085	31,782	41,477
Operations												
Work Week	*days*			4.4	4.5	4.5	4.0	4.5	4.5	4.0	4.5	4.5
Work Day	*hrs*			8.3	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pump/Centrifuge in Use	*qty*			1	1	1	1	1	1	1	1	1
Equipment Rating												
Flow	*gpm =>pump*	300	200	145	166	212	186	205	262	227	250	319
	gpm =>Cent	250	200									
	gpm =>Alfa	225	200									
Loading	*lbs/hr =>Cent*	3000	2200	1,864	2,107	2,749	2,222	2,607	3,403	2,709	3,178	4,148
	lbs/hr =>Alfa	2813	?									
Performance												
Feed Solids	*%*			2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%
Cake Solids	*%*			22.00%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%
Cake Density	*lbs/cf*			62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4
Capture Efficiency	*%*			98.55%	97%	97%	97%	97%	97%	97%	97%	97%
Cake Discharge												
Volume	*cf/day*			1,111	1,489	1,943	1,570	1,842	2,404	1,914	2,246	2,931
Solids	*dry ppd*			15,251	20,435	26,669	21,553	25,290	33,005	26,272	30,828	40,233
	wet ppd			69,321	92,888	121,224	97,966	114,954	150,021	119,420	140,128	182,877
	wet ton/day			34.7	46.4	60.6	49.0	57.5	75.0	59.7	70.1	91.4
	wet ton/hr			4.2	4.6	6.1	4.9	5.7	7.5	6.0	7.0	9.1

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Water Additions												
Startup/Plug												
Duration	*min*			15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Rate	*gpm*			60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Volume	*gpd*			900	900	900	900	900	900	900	900	900
Solids	*ppd*			1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Polymer												
Feed Rate	*lbs/dt*			30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8	30.8
Neat Concentration	*%*			42%	42%	42%	42%	42%	42%	42%	42%	42%
Polymer Density	*lbs/gal*			8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
Make-Up Concentration	*%*			0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Volume	*gpd*			13,364	18,193	23,743	19,188	22,515	29,384	23,390	27,446	35,819
Raw Polymer	*ppd*			239	325	424	343	402	525	418	490	639
CIP/Wash												
Duration	*min*			20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Rate	*gpm*			60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Volume	*gpd*			1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Solids	*ppd*			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Centrate												
Volume	*gpd*			63,998	88,464	112,605	99,972	109,194	139,035	121,865	133,107	169,482
Solids	*ppd*			212	620	813	655	770	1,009	801	942	1,232
Total Centrate												
Volume	*gpd*			79,462	108,758	138,448	121,260	133,810	170,518	147,356	162,653	207,401
Solids	*ppd*			224	632	825	667	782	1,021	813	953	1,244
Trucking Check												
Regular	*gal/truck*			7,946	8,366	8,144	8,084	7,871	8,120	7,756	7,745	7,977
Road Restrictions	*gal/truck*			7,224	7,251	6,922	7,133	7,043	7,105	7,017	7,072	6,913

				Current				2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Bioset Lime												
Solids Feed												
Volume	*cf/day*			1,111	1,489	1,943	1,570	1,842	2,404	1,914	2,246	2,931
Solids	*dry ppd*			15,251	20,435	26,669	21,553	25,290	33,005	26,272	30,828	40,233
	dry lbs/hr			1,837	2,044	2,667	2,155	2,529	3,300	2,627	3,083	4,023
	wet ppd			69,321	92,888	121,224	97,966	114,954	150,021	119,420	140,128	182,877
	wet lbs/hr	16,429		8,352	9,289	12,122	9,797	11,495	15,002	11,942	14,013	18,288
	wet ton/day			34.7	46.4	60.6	49.0	57.5	75.0	59.7	70.1	91.4
	wet ton/hr			4.2	4.6	6.1	4.9	5.7	7.5	6.0	7.0	9.1
Temperature												
Feed Cake	*deg F*			55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Final	*deg F*			135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0	135.0
IS LIME SYSTEM BEING USED	*Yes/No*			no	no	no	no	no	no	no	no	no
Lime												
Dosage - wet basis	*% wet solids*			11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%	11.3%
CaO Content	*%*			93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%
Heat Capacity of Lime	*btu/lb*			600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0	600.0
Lime Density	*lbs/cf*			75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Sulfamic Acid												
Dosage - dry basis	*% dry solids*			0.75%	0.75%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Equivalent CaO Content	*%*			131.0%	131.0%	131.0%	131.0%	131.0%	131.0%	131.0%	131.0%	131.0%
Operations												
Work Week	*days*			4.40	4.50	4.50	4.00	4.50	4.50	4.00	4.50	4.50
Work Day	*hrs*			8.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Lime Addition	*lbs/hr*			0	0	0	0	0	0	0	0	0
	lbs/min	57		0.00	0	0	0	0	0	0	0	0
	cf/hr			0	0	0	0	0	0	0	0	0
	lbs/day			0	0	0	0	0	0	0	0	0
Dry Ratio	*%*			0%	0%	0%	0%	0%	0%	0%	0%	0%
Sulfamic Acid Addition	*lbs/day*			0	0	0	0	0	0	0	0	0
Heat												
Sludge Requirement	*btu/hr*			565,258	628,665	820,441	663,036	778,007	1,015,342	808,237	948,387	1,237,709
From Lime	*btu/hr*			0	0	0	0	0	0	0	0	0
From Sulfamic Acid	*btu/hr*			0	0	0	0	0	0	0	0	0
Deficit (surplus)	*btu/hr*			(565,258)	(628,665)	(820,441)	(663,036)	(778,007)	(1,015,342)	(808,237)	(948,387)	(1,237,709)

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Cake Sludge												
Volume	*cf/hr*			134	149	194	157	184	240	191	225	293
	gpm	42		17	19	24	20	23	30	24	28	37
	cf/day			1,111	1,489	1,943	1,570	1,842	2,404	1,914	2,246	2,931
Solids	*dry lbs/hr*			1,837	2,044	2,667	2,155	2,529	3,300	2,627	3,083	4,023
	dry ppd			15,251	20,435	26,669	21,553	25,290	33,005	26,272	30,828	40,233
	wet lbs/hr			8,352	9,289	12,122	9,797	11,495	15,002	11,942	14,013	18,288
	wet ppd			69,321	92,888	121,224	97,966	114,954	150,021	119,420	140,128	182,877
	wet ton/hr			4.2	4.6	6.1	4.9	5.7	7.5	6.0	7.0	9.1
	wet ton/day			34.7	46.4	60.6	49.0	57.5	75.0	59.7	70.1	91.4
	%			22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%
Temperature	*deg F*			55	55	55	55	55	55	55	55	55
	deg C			13	13	13	13	13	13	13	13	13
Reactor												
Length	*ft*			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Diameter	*ft*			25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Volume	*cf*			314	314	314	314	314	314	314	314	314
Detention Time	*min*	60		141	127	97	120	102	78	98	84	64
Lime Silo												
Quantity	#	2		2	2	2	2	2	2	2	2	2
Silo Volume	*cf*	2100		2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Lime Storage Volume	*cf*			4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200
Lime Storage	*weeks*			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Sludge Drying												
Cake Sludge												
Volume	*cf/hr*			134	149	194	157	184	240	191	225	293
	gpm			17	19	24	20	23	30	24	28	37
	cf/day			1,111	1,489	1,943	1,570	1,842	2,404	1,914	2,246	2,931
Solids	*dry lbs/hr*			1,837	2,044	2,667	2,155	2,529	3,300	2,627	3,083	4,023
	dry ppd			15,251	20,435	26,669	21,553	25,290	33,005	26,272	30,828	40,233
	wet lbs/hr			8,352	9,289	12,122	9,797	11,495	15,002	11,942	14,013	18,288
	wet ppd			69,321	92,888	121,224	97,966	114,954	150,021	119,420	140,128	182,877
	wet ton/hr			4.2	4.6	6.1	4.9	5.7	7.5	6.0	7.0	9.1
	wet ton/day			34.7	46.4	60.6	49.0	57.5	75.0	59.7	70.1	91.4
	%			22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%
Temperature	*deg F*			55	55	55	55	55	55	55	55	55
	deg C			13	13	13	13	13	13	13	13	13
IS DRYER BEING USED	*Yes/No*			yes	yes	yes	yes	yes	yes	yes	yes	yes
Operations												
Work Week	*days*			4.40	4.50	4.50	4.00	4.50	4.50	4.00	4.50	4.50
Work Day	*hrs*			8.30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Target Dried Solids	*%*			90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
Reactor Feed												
Volume	*cf/hr*			133.8	148.9	194.3	157.0	184.2	240.4	191.4	224.6	293.1
Solids	*dry ton/hr*			0.9	1.0	1.3	1.1	1.3	1.7	1.3	1.5	2.0
	wet ton/hr			4.2	4.6	6.1	4.9	5.7	7.5	6.0	7.0	9.1
Sludge Discharge												
Volume	*cf/hr*			32.7	36.4	47.4	38.3	45.0	58.7	46.7	54.8	71.6
	cf/day			271	364	474	383	450	587	467	548	716
	cf/yr			62,080	85,076	111,029	79,758	105,287	137,405	97,225	128,344	167,497
	cy/yr			2,299	3,151	4,112	2,954	3,900	5,089	3,601	4,753	6,204
Solids	*dry ppd*			15,251	20,435	26,669	21,553	25,290	33,005	26,272	30,828	40,233
	dry ton/yr			1,745	2,391	3,120	2,241	2,959	3,862	2,732	3,607	4,707
	wet ppd			16,945	22,706	29,632	23,947	28,100	36,672	29,192	34,254	44,703
	wet ton/yr			1,939	2,657	3,467	2,491	3,288	4,291	3,036	4,008	5,230
Evaporate												
Volume	*gpd*			6,280	8,415	10,982	8,875	10,414	13,591	10,819	12,695	16,568
	lbs/day			52,376	70,182	91,591	74,019	86,854	113,349	90,229	105,875	138,173
	ton/day			26	35	46	37	43	57	45	53	69
	ton/hr			3.2	3.5	4.6	3.7	4.3	5.7	4.5	5.3	6.9

					Current			2028			2038	
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Class A Sludge Storage												
Cake Sludge												
Volume	*cf/hr*			32.7	36.4	47.4	38.3	45.0	58.7	46.7	54.8	71.6
	cf/day			271	364	474	383	450	587	467	548	716
	cf/yr			62,080	85,076	111,029	79,758	105,287	137,405	97,225	128,344	167,497
	cy/yr			2,299	3,151	4,112	2,954	3,900	5,089	3,601	4,753	6,204
Solids	*dry ppd*			15,251	20,435	26,669	21,553	25,290	33,005	26,272	30,828	40,233
	dry ton/yr			1,745	2,391	3,120	2,241	2,959	3,862	2,732	3,607	4,707
	wet ppd			16,945	22,706	29,632	23,947	28,100	36,672	29,192	34,254	44,703
	wet ton/yr			1,939	2,657	3,467	2,491	3,288	4,291	3,036	4,008	5,230
Existing Storage Structure												
Effective Width	*ft*			115	115	115	115	115	115	115	115	115
Effective Length	*ft*			220	220	220	220	220	220	220	220	220
Stack Height	*ft*			8	8	8	8	8	8	8	8	8
Storage Capacity	*cy*			7,496	7,496	7,496	7,496	7,496	7,496	7,496	7,496	7,496
Storage	*days*			1,190	868	665	926	702	538	760	576	441
Additional Storage Required (180 days min)	*cy*			0			0			0		
Area Required	*sq ft*			0			0			0		

				Current			2028			2038		
		Existing Rated Capacity	Existing Observed Capacity	Existing Annual Average (2017 - June 2018)	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day	Annual Average	Max Week Loading	Max Day
Centrate Treatment												
Centrate												
Volume	*gpd*			79,466	108,761	138,453	121,264	133,814	170,524	147,360	162,659	207,408
Solids	*ppd*			224	632	825	667	782	1,021	813	953	1,244
Existing Storage												
Width	*ft*			16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
Length	*ft*			56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0
Effective Depth	*ft*			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Individual Volume	*gal*			68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403	68,403
Quantity in Use	#			2	1	1	0	0	0	0	0	0
Total Tank Volume	*gal*			136,806	68,403	68,403	0	0	0	0	0	0
New Storage												
In Use?				yes	yes	yes	yes	yes	yes	yes	yes	yes
Diameter	*ft*			36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Area	*sf*			1,017.9	1,017.9	1,017.9	1,017.9	1,017.9	1,017.9	1,017.9	1,017.9	1,017.9
Clarifier												
Cone Depth	*ft*			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SWD	*ft*			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Volume	*gal*			27,916.9	27,916.9	27,916.9	27,916.9	27,916.9	27,916.9	27,916.9	27,916.9	27,916.9
Storage												
SWD				15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Volume				114,206	114,206	114,206	114,206	114,206	114,206	114,206	114,206	114,206
Total Storage Volume	*gal*			278,929	210,526	210,526	142,123	142,123	142,123	142,123	142,123	142,123
Centrate Solids Treatment												
Overflow Rate	*gpd/sf*			78.1	106.9	136.0	119.1	131.5	167.5	144.8	159.8	203.8
Detention Time	*operating day*			62.3	22.1	16.9	21.0	17.9	13.7	17.2	14.7	11.2
Removal Efficiency	*%*			50%	50%	50%	50%	50%	50%	50%	50%	50%
Sludge Concentration	*%*			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Sludge Recycle												
Volume	*gpd*			448.4	1,263.0	1,648.3	1,332.1	1,563.1	2,039.9	1,623.8	1,905.4	2,486.6
TS	*ppd*			112.2	316.0	412.4	333.3	391.1	510.4	406.3	476.7	622.2
Centrate												
Volume	*gpd*			79,017	107,498	136,804	119,932	132,251	168,484	145,736	160,753	204,921
Solids	*ppd*			112.2	316.0	412.4	333.3	391.1	510.4	406.3	476.7	622.2
Storage Surplus (Deficit)	*gpd*			199,912	103,027	73,721	22,191	9,872	(26,362)	(3,614)	(18,631)	(62,799)

APPENDIX H

Environmental Impacts

Endangered Resources Preliminary Assessment

Created on **1/28/2020**. This report is good for one year after the created date.

Results

A search was conducted of the NHI Portal within a 1-mile buffer (for terrestrial and wetland species) and a 2-mile buffer (for aquatic species) of the project area. Based on these search results, below are your follow-up actions.

Further actions are required to ensure compliance with Wisconsin's Endangered Species Law (s. 29.604 Wis. Stats.) and the Federal Endangered Species Act (16 USC ss 1531-43). One or more of the following situations apply:

- The species recorded are state or federal threatened or endangered animals.
- The project site overlaps the Karner Blue Butterfly High Potential Range.
- The project overlaps the Rusty Patched Bumble Bee High Potential Zone.
- The species recorded are state threatened or endangered plants on public land.
- The species recorded are federal threatened or endangered plants on federal land or involve federal funds or a federal permit.

Therefore you should request an Endangered Resources Review https://dnr.wi.gov/topic/ERReview/Review.html. An ER Review is the mechanism to ensure compliance with Wisconsin's Endangered Species Law (s. 29.604 Wis. Stats.) and the Federal Endangered Species Act (16 USC ss 1531-43). The ER Review will list the endangered resources that have been recorded within the vicinity of the project area and follow-up actions may be necessary.

A copy of this document can be kept on file and submitted with any other necessary DNR permit applications to show that the need for an ER Review has been met. This notice only addresses endangered resources issues. This notice does not constitute DNR authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the DNR and/or other permitting authorities.

Project Information

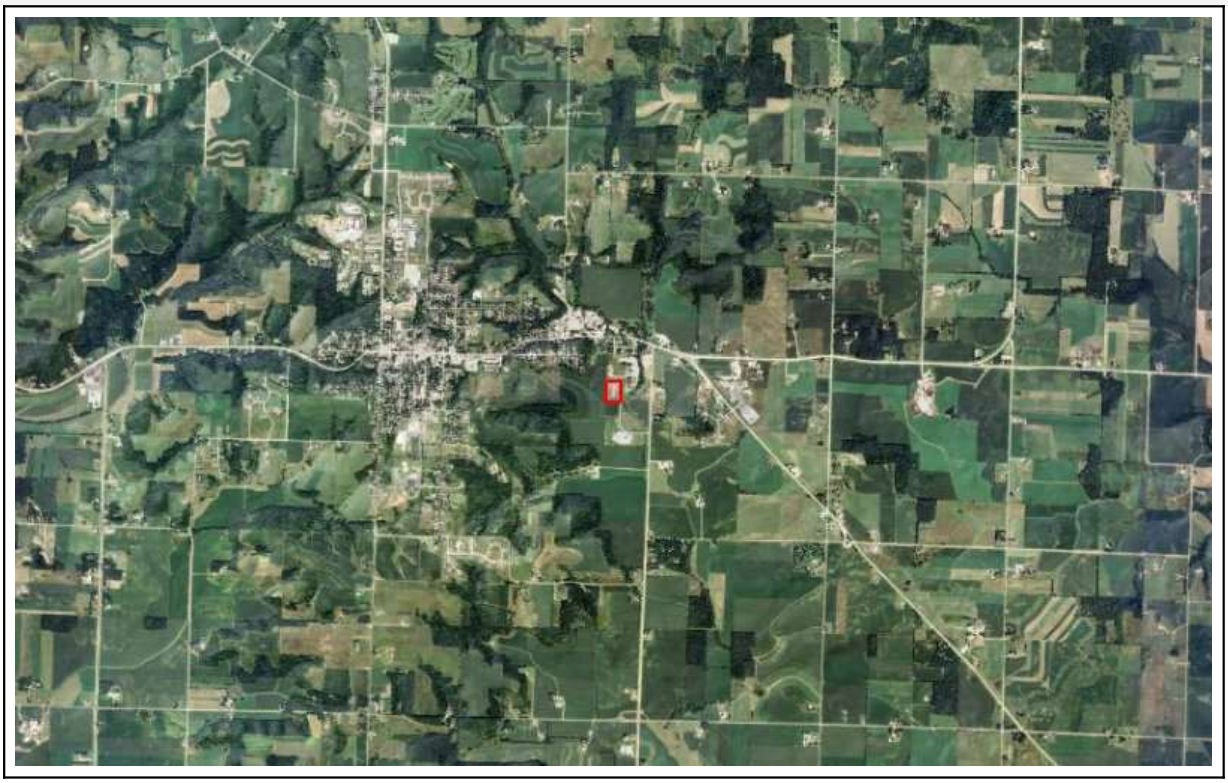
Landowner name	**West Central Wisconsin Biosolids Facility**
Project address	**677 E Bio Ave, Ellsworth, WI 54011**
Project description	**Facility upgrade**

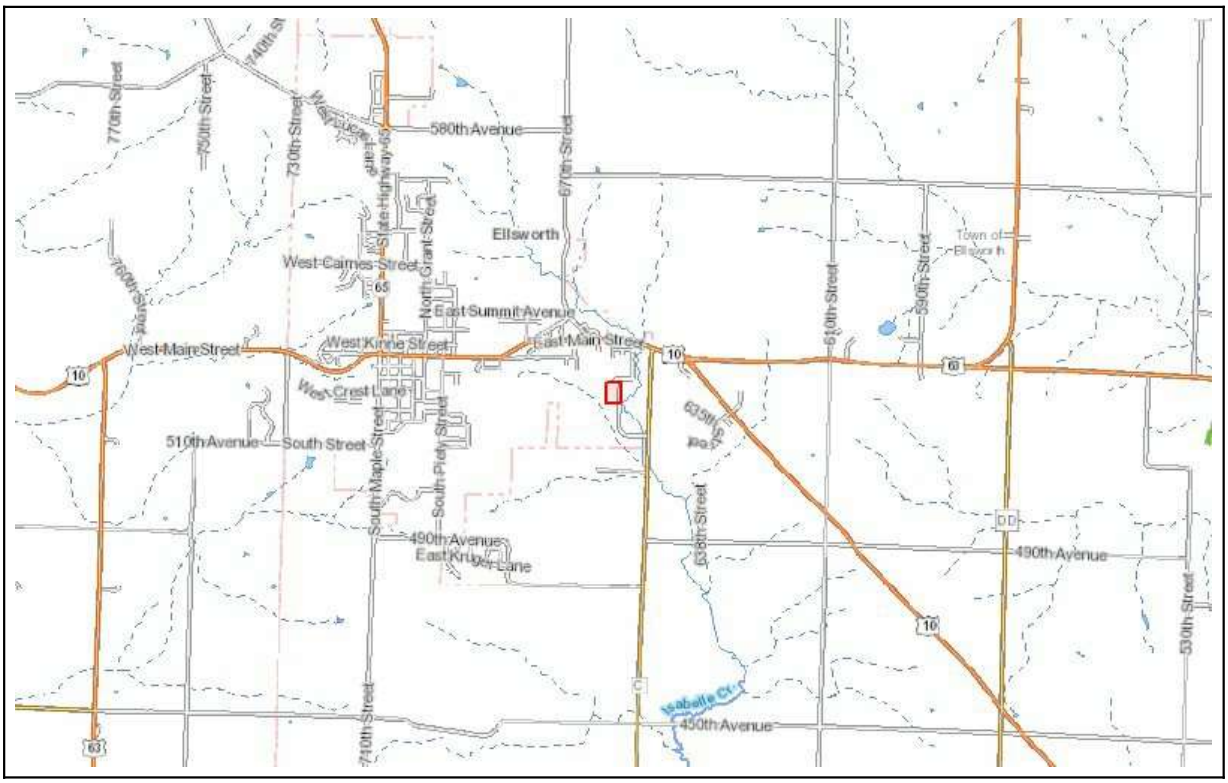
Project Questions

Does the project involve a public property?	**Yes**
Is there any federal involvement with the project?	**Yes**
Is the project a utility, agricultural, forestry or bulk sampling (associated with mining) project?	**Yes**
Is the project property in Managed Forest Law or Managed Forest Tax Law?	**No**
Project involves tree removal?	**Yes**
Does project have urban/residential habitat?	**Yes**
Does project have manicured lawn?	**Yes**

Does project have artificial/paved surface?	**Yes**
Does project involve agricultural land?	**No**
Does project have areas covered in crushed stone or gravel?	**Yes**
Is project near (within 300 ft) a waterbody or a shoreline?	**Yes**
Is project within a waterbody or along the shoreline?	**No**

Project Area Maps





IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Pierce County, Wisconsin

Local office

Green Bay Ecological Services Field Office

(920) 866-1717
(920) 866-1710

2661 Scott Tower Drive
New Franken, WI 54229-9565

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Clams

NAME	STATUS
Higgins Eye (pearlymussel) Lampsilis higginsii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5428	Endangered
Sheepnose Mussel Plethobasus cyphyus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6903	Endangered

Flowering Plants

NAME	STATUS
Prairie Bush-clover Lespedeza leptostachya No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4458	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE

DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Breeds Dec 1 to Aug 31

Lesser Yellowlegs Tringa flavipes
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Breeds elsewhere

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

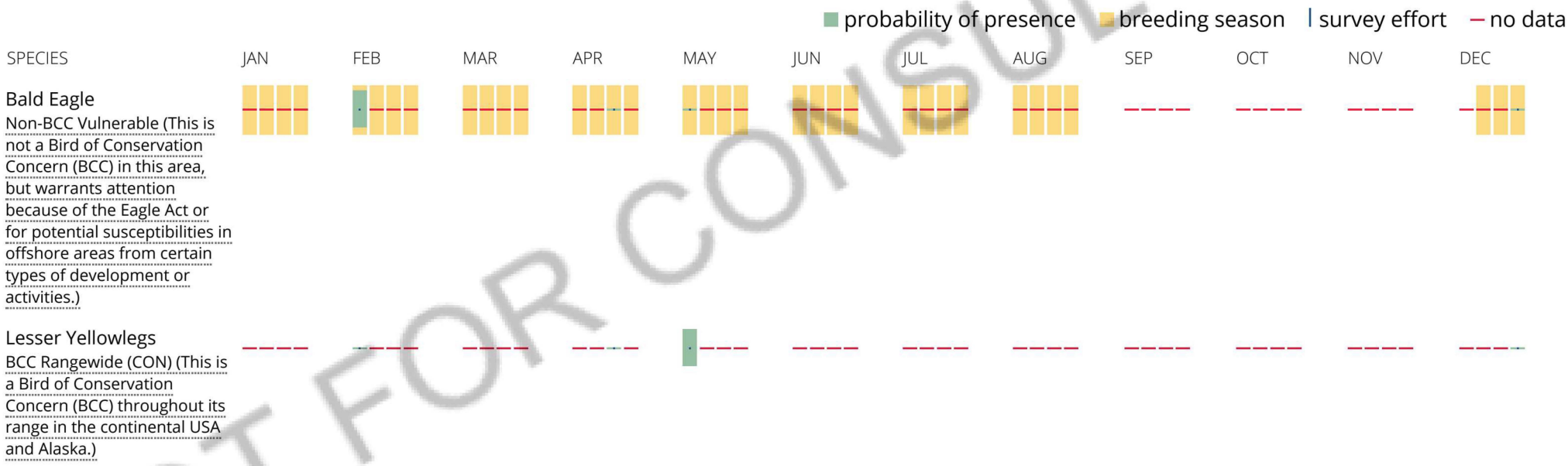
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or

longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

APPENDIX I

User Charge Impacts

West Central Wisconsin Biosolids Facility
Facilities Plan
User Charge Impact Estimate - Bagging
September 16, 2020

Assumptions
1. All expenses listed assume 2020 dollars and loadings. Inflation and increased loadings not included for future (phase 2) project costs for rate impact.
2. Financing through WI DNR CWF with 19 year amortization (actual = 20, though may be 19 years depending upon closing date) with 2.5% interest (current closer to 2.0% for eligible portions of projects)

Project Details	Capital Cost	Grant	Financed Cost	APR	Term	P&I
Phase 1	$16,468,114	$0	$16,468,114	2.50%	19	$1,099,421
Phase 2	$2,389,130	$0	$2,389,130	2.50%	19	$159,500

				UCS Estimate		
	2017	2018	2019	Phase 1	Phase 2	Combined
Expenses						
Existing Expenses						
Administrative	$49,275	$50,149	$63,392	$54,272	$54,272	$54,272
Operations	$834,056	$845,547	$923,381	$816,478	$816,478	$816,478
Maintenance/Capital	$100,120	$318,959	$296,425	$238,501	$238,501	$238,501
Transportation	$546,069	$629,444	$808,689	$587,756	$587,756	$587,756
Marketing	$47,885	$42,590	$30,645	$40,373	$40,373	$40,373
Replacement Fund	$451,256	$300,000	$300,000	$300,000	$300,000	$300,000
Proposed Expenses						
P&I				$1,099,421	$159,500	$1,258,921
O&M Additions				-$52,298	-$52,298	-$104,596
Replacement Fund Additions				$88,155	$25,204	$113,359
Total Expenses	**$2,028,661**	**$2,186,689**	**$2,422,531**	**$3,172,659**	**$2,169,786**	**$3,305,065**
Revenue						
Existing Revenue						
Member	$1,590,392	$1,706,700	$1,908,755	$1,735,283	$1,735,283	$1,735,283
Non-Member	$436,624	$473,564	$508,383	$472,857	$472,857	$472,857
Interest/Misc.		$18,815	$24,655	$21,735	$21,735	$21,735
Additional Revenue Required				$942,785	-$60,088	$1,075,191
Total Revenue	**$2,027,016**	**$2,199,079**	**$2,441,793**	**$3,172,659**	**$2,169,786**	**$3,305,065**
Required Revenue Increase				42.7%	-2.4%	48.7%
Required Revenue Increase (not including Transport)				65.6%	1.3%	74.0%

West Central Wisconsin Biosolids Facility
Facilities Plan
User Charge Impact Estimate - Silo
September 16, 2020

Assumptions
1. All expenses listed assume 2020 dollars and loadings. Inflation and increased loadings not included for future (phase 2) project costs for rate impact.
2. Financing through WI DNR CWF with 19 year amortization (actual = 20, though may be 19 years depending upon closing date) with 2.5% interest (current closer to 2.0% for eligible portions of projects)

Project Details	Capital Cost	Grant	Financed Cost	APR	Term	P&I
Phase 1	$18,612,711	$0	$18,612,711	2.50%	19	$1,242,596
Phase 2	$2,389,130	$0	$2,389,130	2.50%	19	$159,500

				UCS Estimate		
	2017	2018	2019	Phase 1	Phase 2	Combined
Expenses						
Existing Expenses						
Administrative	$49,275	$50,149	$63,392	$54,272	$54,272	$54,272
Operations	$834,056	$845,547	$923,381	$816,478	$816,478	$816,478
Maintenance/Capital	$100,120	$318,959	$296,425	$238,501	$238,501	$238,501
Transportation	$546,069	$629,444	$808,689	$587,756	$587,756	$587,756
Marketing	$47,885	$42,590	$30,645	$40,373	$40,373	$40,373
Replacement Fund	$451,256	$300,000	$300,000	$300,000	$300,000	$300,000
Proposed Expenses						
P&I				$1,242,596	$159,500	$1,402,096
O&M Additions				$94,452	$94,452	$188,905
Replacement Fund Additions				$176,043	$25,204	$201,247
Total Expenses	**$2,028,661**	**$2,186,689**	**$2,422,531**	**$3,550,472**	**$2,316,537**	**$3,829,628**
Revenue						
Existing Revenue						
Member	$1,590,392	$1,706,700	$1,908,755	$1,735,283	$1,735,283	$1,735,283
Non-Member	$436,624	$473,564	$508,383	$472,857	$472,857	$472,857
Interest/Misc.		$18,815	$24,655	$21,735	$21,735	$21,735
Additional Revenue Required				$1,320,598	$86,662	$1,599,754
Total Revenue	**$2,027,016**	**$2,199,079**	**$2,441,793**	**$3,550,472**	**$2,316,537**	**$3,829,628**
Required Revenue Increase				59.7%	4.2%	72.3%
Required Revenue Increase (not including Transport)				89.8%	10.7%	107.6%

APPENDIX J

Public Input