Two Lakes Sewer Authority
Preliminary Engineering Report

WASTEWATER COLLECTION AND TREATMENT SYSTEM PROJECT

Two Lakes Sewer Authority
5435 Main Street
Onekama, Michigan 49675

June 2019

Draft

Prepared by:
WADE TRIM
10850 East Traverse Hwy
Traverse City, Michigan 49684

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Two Lake Sewer Authority

Draft Preliminary Engineering Report

June 5, 2019

This report is a draft copy and may be revised or updated based on input from USDA Rural Development, Two Lakes Sewer Authority participating municipalities, or other reviewing entities or project participants.

Two Lakes Sewer Authority
Preliminary Project Cost Summary
Preliminary Engineering Draft Report - June 6, 2019

Preliminary Collection Costs	Capital Cost	O&M
Low Pressure Sewer	29,583,000	420,000
Septic Tank Effluent Pumping (STEP)	27,383,000	390,000

Preliminary Treatment Costs (Includes Force Main Transmission)	WWTP Cost	Annual O&M
Onekama Township WWTP:	13,926,000	328,400
TLSA WWTP:	13,646,000	299,000
Aero-Mod WWTP	8,310,000	312,000
LRBOI WWTP:	7,831,000	593,600

Cost Comparisons

STEP, Treatment at LRBOI	Capital Cost	O&M
Collection	$27,383,000	$390,000
WWTP Infrastructure	$7,831,000	$593,600
Total	$35,214,000	$983,600
	Present Worth Analysis=	**$56,546,957**

STEP, Treatment at Onekama WWTP	Capital Cost	O&M
Collection	27,383,000	390,000
WWTP Infrastructure	13,926,000	328,400
Total	41,309,000	718,400
	Present Worth Analysis=	**$56,839,808**

STEP, Treatment at TLSA Mechanical WWTP	Capital Cost	O&M
Collection	27,383,000	390,000
WWTP Infrastructure	8,310,000	312,000
Total	35,693,000	702,000
	Present Worth Analysis=	**$50,899,590**

STEP, Treatment at TLSA Lagoon WWTP	Capital Cost	O&M
Collection	27,383,000	390,000
WWTP Infrastructure	13,646,000	299,000
Total	41,029,000	689,000
	Present Worth Analysis=	**$55,922,113**

Two Lakes Sewer Authority
Anticipated Flows and User Summary
Preliminary Engineering Report - June 2019

Initial System (anticipated connections at project completion)

Municipality	Anticipated Connections	Resulting REU's	Anticipated Flow (GPD)
Onekama Twp.:	499	499	84830
Bear Lake Village:	99	117	19890
Bear Lake Township:	164	191.5	32555
Pleasanton Township	238	243.5	41395
Total:	1,000	1,051	178,670

Daily flow @ 167 gal/REU/day (RUS Bulletin 1780-2 of 4/4/13)

Total Future System (all connections at full sewer district buildout)

Municipality	Anticipated Connections	Resulting REU's	Anticipated Flow (GPD)
Onekama Twp.:	928	954	159318
Bear Lake Village:	125	143	23881
Bear Lake Township:	166	193	32231
Pleasanton Township	238	243.5	40664.5
Total:	1,457	1,534	256,095

Daily flow @ 167 gal/REU/day (RUS Bulletin 1780-2 of 4/4/13)

Total Future Anticipated Connections is all assessed parcels served by the sewer district.

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1.0 PROJECT SUMMARY/NARRATIVE

The Two Lakes Sewer Authority (TLSA) was formed in 2017 with the mission of investigating the feasibility of constructing a sanitary sewage collection and treatment system for the participating municipalities being the Village of Bear Lake and the Townships of Onekama, Bear Lake, and Pleasanton, all located in Manistee County, Michigan. While these municipalities cover a broad geographic area, the project is essentially centered around the lakeshores of Portage Lake and Bear Lake. With the large number of seasonal and year-round homes existing along the shores of these bodies of water, lingering concern about the future water quality of these lakes is mounting as development continues and small cabin sites get redeveloped into year-round homes. However, it is not the threat of development driving the investigation, but the potential issues caused by failed septic systems, the use of mounded drain fields, and the need for holding tanks in the area. Like so many lakeshore communities, the proposed project area is not without its issues of failed septic systems, or due to the granular soils in the area, systems that provide very little natural treatment before the wastewater encounters the water table. To help protect the lake, and subsequently the health and safety of the users of the resources, the Two Lakes Sewer Authority is investigating the development and construction of a wastewater collection system around each lake.

The proposed project includes constructing a low-pressure wastewater collection system around Portage Lake and Bear Lake that will connect to a regional treatment facility. The planning area for this project includes properties around Portage Lake, but outside of the Village of Onekama; the Village of Bear Lake, Bear Lake Township, and Pleasanton Township. Currently, the entire project is proposed to be located in existing public road rights-of-way or public lands, with the exception of individual homeowner connections that will require permanent easements. Areas disturbed by the project will be restored with grass, roadway, sidewalk, etc. in an effort to return the land to its original state.

2.0 PROJECT PLANNING AREA

The planning area for this project is extensive and was developed to encompass the properties around Portage and Bear Lakes, along with those along the shores of Lake Michigan in the near vicinity of the Portage Lake watershed.

2.1 LOCATION

The project service area has been defined by each of the four municipalities included in the TLSA. The service districts were determined by providing a basic service area map that included all parcels abutting the lakefront and adjacent road lots of both Portage and Bear Lakes within the TLSA municipalities. Also included were all properties on the opposite side of the street where the sewer main or force main would be located.

These maps were reviewed by the municipalities and presented at public meetings where individual parcel owners were able to request inclusion or exclusion from the project area. Several lots and portions of the Village of Bear lake requested inclusion and were added when the infrastructure required made sense to include them. Only a few areas were removed when requested. These areas generally included areas where development would not occur such as school owned parcels, unbuildable lots, etc. It was stated in public meetings that any parcel not included in the initial service district would be required to pay all costs for any infrastructure needed to connect to the system as well as the buy-in cost for the overall system, without the option of a 40-year special assessment payoff should they desire to connect in the future. This was also noted for owners with multiple adjacent parcels, where a single residence on multiple lots would not be able to develop those additional lots without paying the applicable connection fees.

Each municipality has defined the service district within its jurisdiction. Those areas are compiled into two major areas of the Bear Lake Service Area and the Portage Lake Service Area. Maps of these areas and lists of the parcels included can be viewed in Attachment 1.

The transmission force mains and treatment facilities would be located outside of the service districts, but specific force main routes and treatment facility location will depend upon the treatment alternative chosen. Newly constructed treatment facilities are assumed to be located in between the two collection areas in order to minimize transmission distance.

The overall layout of the system, along with the properties that are currently included in the service district, can be viewed in Attachment 2.

2.2 ENVIRONMENTAL RESOURCES PRESENT

No environmental report has been done for the area discussed in this report yet. If the project moves forward with a full application for funding, then the environmental report will be completed.

2.3 GROWTH AREAS AND POPULATION TRENDS

The project planning area is primarily residential, although the force main portions will cross large areas of rural agricultural lands to get to the chosen treatment facility. Each Municipality within the Two Lakes Sewer Authority has set the service district area within their individual municipal boundaries.

A table showing the population growth for the municipalities included in the TLSA from 2000 through 2017 can be seen in Table 1 below. This chart also shows the population projection out to 2031. It should be noted that this table represents the municipalities in their entirety whereas the TLSA will be comprised of only a portion of each individual municipality.

Table 1

Area	2000 Census	2010 Census	2017 Estimate	2000-2010 change	2010-2017 change	2000-2017 change	Annual change
Bear Lake Twp	1587	1465	1442	-8%	-2%	-9%	-0.5%
Bear lake Village	318	286	280	-10%	-2%	-12%	-0.7%
Onekama Twp	867	918	901	6%	-2%	4%	0.2%
Pleasanton Twp	817	818	806	0%	-1%	-1%	-0.1%
Total Service area	3589	3487	3429	-3%	-2%	-4%	-0.3%

All municipalities except Onekama Township have seen negative population records and estimates over the 2000 to 2017 period, with the rate of decrease becoming smaller or slightly positive in the most recent estimates. Only Onekama Township has seen a net positive growth over that time period.

Since our project service district includes only a portion of the municipalities that physically surround the lakes, population is not expected to decrease as these are generally the most desirable locations and any vacancies are easily replaced. Onekama Township has the most vacant buildable properties within the service districts and has accounted for the potential future growth of their system based on vacant buildable parcels within their service district. The other municipalities are mostly built out within the service districts.

2.4 COMMUNITY ENGAGEMENT

The Two Lakes Sewer Authority was formed in 2017 after months of public meetings discussing the potential project. Once formed, all four municipalities had multiple public meetings to receive public input, determine and define the areas to be served by the proposed system, and discuss how parcels within the service districts will be assessed sewer rates. The authority engaged the services of engineers, bond attorneys, municipal finance experts, municipal attorneys, and local health department to assist in the public discussions on how the project may proceed and the potential impacts to individual residents and businesses. Projects of similar intent have been discussed and proposed several different times in the past but ultimately all previous efforts failed.

3.0 EXISTING FACILITIES

The sewage collection system will be an entirely new system serving areas with septic systems. These septic systems will be abandoned after the individual homes are switched over to the collection system. No collection system exists within the proposed service districts. Two of the potential treatment alternates investigated utilize existing facilities near the project service areas.

4.0 NEED FOR PROJECT

Comprised mostly of agricultural and residential uses, the municipalities that make up the sewer authority boast many miles of inland lake and Lake Michigan shoreline. The current population of all 4 municipalities is approximately 3,500 people. Currently, there are no public wastewater treatment or collection facilities within these municipalities. Septic fields have been constructed and operated by individual properties to treat wastewater. Many properties have experienced problems with their septic systems and have constructed temporary and/or additional systems to handle their wastewater. Many of these failed or alternative septic systems are found adjacent to Portage and Bear Lake where the groundwater table is high and little treatment is anticipated prior to mixing with surface waters. This can pose a severe health and safety risk to the users of the public water body, and over time can be detrimental to the health of the water body itself. With the large number of seasonal and year-round homes existing along the shores of these bodies of water, lingering concern about the future water quality of these lakes is mounting as development continues and small cabin sites get redeveloped as year-round homes. To help protect the lake, and subsequently the health and safety of the users of the resources, the Two Lakes Sewer Authority is investigating the development and construction of a wastewater collection system around each lake.

5.0 ALTERNATIVES CONSIDERED

To help protect the natural resources and the health and safety of its residents, the Sewer Authority is proposing to construct low pressure wastewater collection systems around Portage and Bear Lakes that will collect the waste and send it to an appropriate Wastewater Treatment Facility (WWTF). Except for individual service line connections, the entire project is proposed to be located in existing public road rights-of-way, on public lands, or on lands to be purchased by the Authority if a treatment plant or lagoon needs to be constructed. Individual service line connections will require an easement for the installation of the selected system. The connection from the residence to the pump station and any associated work to abandon existing septic system will be separated from the rest of the project and paid for separately by the individual parcel owner by including this cost in the special assessment charge.

A multitude of alternatives for wastewater collection and treatment are available to most projects. The designer needs to consider many different aspects of a project when making a selection. Items such as construction cost, operation and maintenance costs, and product availability are certainly factors. However, other factors such as geology, topography, groundwater elevation, and current surface improvements all play a big role in the selection of the wastewater systems. For this project, other than the option of "do nothing," the alternatives investigated are as follows:

5.1 COLLECTION ALTERNATIVES

1. Low pressure grinder pump collection system
2. Low pressure septic tank effluent pump (STEP) collection system

5.2 TREATMENT ALTERNATIVES

1. Treatment of the collected waste by the existing Little River Band of Ottawa Indians (LRBOI) wastewater treatment plant.
2. Treatment of collected waste by the existing Village of Onekama Wastewater Treatment Facility.
3. Treatment of collected waste by a newly constructed AeroMOD mechanical wastewater treatment plant owned and operated by the Sewer Authority.
4. Treatment of collected waste by a newly constructed wastewater lagoon system owned and operated by The Sewer Authority.

Each of these options are detailed in the following sections.

- ***Collection Alternative 1: Low Pressure Grinder Pump Collection***

A. Description:

This alternative would collect the wastewater through the use of small-diameter PVC or HDPE force mains and individual grinder pumps for each connection. This approach is widely used in situations where gravity flow is challenging due to a very flat ground surface and high groundwater. This method allows for the installation of the force main to be done by horizontal directional drilling which saves cost by removing the need to open cut a trench that disturbs a large area of surface and requires, in most instances, dewatering of the open cut trench. It is anticipated that each parcel and/or home would have its own grinder pump that would pump waste from the home to the force main out in the road. Due to the use of positive-displacement pumps, the need for an intermediate sewage lift station is only anticipated when flows or head exceed the capabilities of the individual residential pumps.

Once the waste is collected from the properties within the service district, it would then be transported to a waste water treatment facility for treatment and disposal. The routes for this force main can be seen in Attachment 2 and varies depending on the treatment alternative chosen. Transmission from the collection system would be done through the use of a duplex sewage pump station and force main, transporting the sewage to the treatment facility. If the treatment facility alternative of the LRBOI is chosen, a duplex sewage lift station will be used to transfer the waste from the Bear Lake Area to the Portage Lake Area, then another duplex station would be used to take all the waste further south to the LRBOI facility.

The Preliminary Engineer's Estimate for this project can be reviewed in Attachment 4. The cost is estimated to be $29,583,000.

B. Design Criteria:

1. 1,000 REU's proposed initially, and 1,457 REU's proposed at full service area buildout.
2. Each REU will contribute 167 gallons per day per RUS Bulletin 1780-2.
3. Every service connection is assumed to require 100' of service line and a septic system abandoned.
4. Low pressure sewers and forcemains sized to provide a minimum of 2 feet per second flow velocity at average daily flow rates.
5. Directional Drilling of service lines, low pressure force main and transmission force mains will be utilized, reducing the restoration costs to service connection locations, and points of additional infrastructure or access are required such as intermediate lift stations, air relief valves, and clean outs.

C. Map: The map of this alternative is shown in Attachment 2.

D. Environmental Impacts: This alternative would utilize directional drilling for main and service placement, reducing construction impact to localized points throughout the service areas opposed to a trench installation where every foot of infrastructure impacts the surface environment. Due to the nature of the area, cultural impacts are anticipated, and some routes may need to be adjusted once the full Environmental Review is completed.

E. Land Requirements: The low pressure and force main route is within existing road rights-of-way, and the individual service connections up to the individual grinder pump station will be within easements. Land or easements may need to be acquired for intermediate lift stations and for the transmission main pumping stations. No easements or land purchase or agreements have been made at this time. Upstream of the grinder pump station would be owned and maintained by the parcel owner.

F. Potential Construction Problems: There are many miles of proposed low pressure sewer and force main proposed so areas of poor soils, high groundwater, and conflicts with other utility infrastructure are likely to be encountered. However, since the installed sewer will be a pressure sewer, it is easy to adjust the location and or depth to work around existing features and utilities.

F. Sustainability Considerations:

1. This alternative requires electric power for each service connection and intermediate lift station. No septic tank pumping is required, reducing trucking and separate disposal of sewage solids.
2. Chemical addition is anticipated to reduce odors and maintain sewage quality for the time required to move the sewage from the individual service connection to the treatment facility.

G. Cost Estimates:

1. Project Cost: $29,583,000
2. Annual Operations and Maintenance: $420,000

- ***Collection Alternative 2: Low Pressure STEP Collection***

A. Description:

This alternative would collect the wastewater through the use of small-diameter PVC or HDPE force mains, individual septic tanks, and effluent pumps for each service connection. This approach is widely used in situations where gravity flow is challenging due to a very flat ground surface and high groundwater. This method allows for the installation of the force main to be done by horizontal directional drilling which saves cost by removing the need to open cut a trench that disturbs a large area of surface and requires, in most instances, dewatering of the open cut trench.

It is anticipated that each parcel and/or home would have its own septic tank and effluent pump that would pump waste from the home to the force main out in the road. Due to the use of positive-displacement pumps, the need for an intermediate sewage lift station is only anticipated when flows or head exceed the capabilities of the individual residential pumps.

Once the waste is collected from the properties within the service district, it would then be transported to a waste water treatment facility for treatment and disposal. The routes for this force main can be seen in Attachment 2 and varies depending on the treatment alternative chosen. Transmission from the collection system would be done through the use of a duplex sewage pump station and force main, transporting the sewage to the treatment facility. If the treatment facility alternative of the LRBOI is chosen, a duplex sewage lift station will be used to transfer the waste from the Bear Lake Area to the Portage Lake Area, then another duplex station would be used to take all the waste further south to the LRBOI facility.

The Preliminary Engineer's Estimate for this project can be reviewed in the Attachment 4. The cost is estimated to be $27,383,000.

B. Design Criteria:
   1. 1,000 REU's proposed initially, and 1,457 REU's proposed at full service area buildout.
   2. Each REU will contribute 167 gallons per day per RUS Bulletin 1780-2.
   3. Every service connection is assumed to require 100' of service line and a septic system is assumed to exist at each initial connection.
   4. One half of the initial connections are assumed to require their septic tank be pumped, and one half of the initial connections are assumed to need a new septic tank installed.
   5. Low pressure sewers and forcemains sized to provide a minimum of 2 feet per second flow velocity at average daily flow rates.
   6. Directional Drilling of service lines, low pressure force main and transmission force mains will be utilized, reducing the restoration costs to service connection locations, and points of additional infrastructure or access are required such as intermediate lift stations, air relief valves, and clean outs.

C. Map: The map of this alternative is shown in Attachment 2.

D. Environmental Impacts: This alternative would utilize directional drilling for main and service placement, reducing construction impact to localized points throughout the service areas opposed to a trench installation where every foot of infrastructure impacts the surface environment. Due to the nature of the area, cultural impacts are anticipated, and some routes may need to be adjusted once the full Environmental Review is completed.

E. Land Requirements: The low pressure sewer and force main route is within existing road rights-of-way, and the individual service connections from the road up to the individual effluent pump station will be within easements.

Land or easements may need to be acquired for intermediate lift stations and for the transmission main pumping stations. No easements or land purchase or agreements have been made at this time. Upstream of the effluent pump, including the septic tank, would be owned and maintained by the parcel owner.

F. Potential Construction Problems: There are many miles of proposed low pressure sewer and force main proposed so areas of poor soils, high groundwater, and conflicts with other utility infrastructure are likely to be encountered. However, since the installed sewer will be a pressure sewer, it is easy to adjust the location and or depth to work around existing features and utilities.

G. Sustainability Considerations:
1. This alternative requires electric power for each service connection and intermediate lift station. The power requirements for the effluent pumps are slightly less than those for a grinder pump due to the solids being removed in a septic tank.
2. Each connection will have a septic tank which requires periodic pumping, trucking and separate disposal of sewage solids.
3. Chemical addition is anticipated to reduce odors and maintain sewage quality for the time required to move the sewage from the individual service connection to the treatment facility.

H. Cost Estimates:
1. Project Cost: $27,383,000
2. Annual Operations and Maintenance: $390,000

- ***Treatment Alternative 1: Treatment by LRBOI***

A. Description:

Once the waste is collected from the properties around Bear and Portage Lakes, it would then be transported to the LRBOI WWTF for treatment and disposal. The proposed route for this force main can be seen in Attachment 2 Transmission from the collection system would be done through the use of duplex sewage pump stations and force main, transporting the sewage to the LRBOI treatment facility, which is located approximately 4.5 miles south of Portage Lake.

Currently, the LRBOI state that the WWTF is operating well under its treatment capacity and it has 0.2 MGD capacity available for the TLSA connection with minimal improvements required. The available capacity is an existing lagoon system that is currently unutilized. Correspondence from the LRBOI also states they would be willing to agree to expand as needed to meet future flows from the TLSA.

With this alternative comes a large contingent of inter-governmental cooperation between the TLSA, a Michigan municipal governmental entity, and the LRBOI, a Sovereign Nation. There have been many meetings between the two entities to discuss this option and both are open to it, however more discussion is needed before formal agreements could be forged.

The Preliminary Engineer's Estimate for this project can be reviewed in the Attachment 4. The cost is estimated to be $7,831,000.

B. Design Criteria:
   1. 1,000 REU's proposed initially, and 1,457 REU's proposed at full service area buildout.
   2. Each REU will contribute 167 gallons per day per RUS Bulletin 1780-2.
   3. Initial sewage flows anticipated at .18 MGD, future flows anticipated at 0.26 MGD.
   4. LRBOI has assessed their facility and provided estimates of improvements and associated costs for TLSA connection to the facility.
   5. Includes cost of force main from Onekama Township to the LRBOI WWTP.

C. Map: The map of this alternative is shown in Attachment 2.

D. Environmental Impacts: Any impacts for this option would be minimal and be localized at the site of the existing LRBOI treatment facility. Impacts from the installation of the delivery sewer (from collection to the treatment site) may arise. This route may need to be adjusted once the full environmental review is completed.

E. Land Requirements: The force main route is within existing road rights-of-way, and all treatment will be at the existing LRBOI facility. Land or easements may be needed for the duplex lift station.

F. Construction Problems: No known construction problems are identified. The LRBOI will provide the design and construction of any needed improvements at the treatment facility.

G. Sustainability Considerations:
   1. This alternative utilizes an existing treatment facility with excess capacity, making the required improvements minimal.

H. Cost Estimates:
   1. Project Cost: $7,831,000
   2. Annual Operations and Maintenance: $593,600

- ***Treatment Alternative 2: Treatment of Wastewater by the Village of Onekama and/or construction of a new lagoon system.***

  Treatment of wastewater by the Village of Onekama has many technical hurdles. The Village of Onekama operates its own Wastewater Treatment Facility located about two miles northeast of the Village. Treatment is handled through a lagoon system that is very common to older systems of smaller communities. Disposal of the treated wastewater is done through spray irrigation on crop fields a couple of miles northeast of the lagoon site.

  Discussions with the Village President have indicated that the plant is operating at its capacity. In 2003, the Village completed a lagoon and irrigation field rehabilitation project. This project relined the lagoons and created a center-pivot irrigation field approximately two miles northeast of the lagoon fields. It does not appear that this project served to substantially expand the capacity of the plant.

  While the Village has indicated they have space to expand the lagoons, the needed expansion would more than double the existing facility size to accommodate the volume anticipated by the TLSA's system. Moving forward with this option would place a large assumption that property can be secured to build new lagoons and expand the spray irrigation areas.

  The Preliminary Engineer's Estimate for this project can be reviewed in the Attachment 4. The cost is estimated to be $13,926,000.

B. Design Criteria:
   1. 1,000 REU's proposed initially, and 1,457 REU's proposed at full service area buildout.
   2. Each REU will contribute 167 gallons per day per RUS Bulletin 1780-2.
   3. Initial sewage flows anticipated at .18 MGD, future flows anticipated at 0.26 MGD.
   4. The Village of Onekama has assessed their facility and provided estimates of improvements and associated costs for TLSA connection to the facility.
   5. A lagoon and irrigation disposal system expansion would be required to accommodate the TLSA proposed flows. Design information included in Attachment 5. Since this requires infrastructure to treat the entire proposed TLSA flow, the design is the same as if the TLSA were to purchase land and construct their own facility.
   6. Includes force main collection system to proposed lagoon location assumed to be located between the two collection areas. Force main length is assumed to be approximately 8 miles.

C. Map: A schematic layout of this alternative is shown in Attachment 5.

D. Environmental Impacts: Impacts for this option include a major expansion of the existing Village treatment facility, most likely on additional purchased properties. Impacts from the installation of the delivery sewer (from collection to the treatment site) may arise. This route may need to be adjusted once the full environmental review is completed.

E. Land Requirements: The force main route is within existing road rights-of-way, and treatment facility expansion will require up to 160 acres to be purchased for treatment and irrigation disposal. Land or easement may be needed for the duplex lift stations to get the sewage to the treatment site.

F. Construction Problems: Locating and acquiring land for this alternate may be challenging. A potential problem with the existing Onekama treatment site is a portion of the lands owned by the village have been identified as having high nitrates, and most likely can not be used for irrigation disposal. The existing lagoon site also has a large wetland on it making it unfeasible for treatment development.

G. Sustainability Considerations:
   1. This alternative utilizes an existing treatment facility between the two collection areas, reducing the pumping and force main length required.
   2. Due to the lagoon treatment and irrigation disposal sites being separated by a substantial distance, pumping and a force main is required between the sites.

H. Cost Estimates:
   1. Construction: $13,926,000
   2. Annual Operations and Maintenance: $328,000

- ***Treatment Alternative 3: Authority-Owned Wastewater Treatment Plant***

This option would utilize a proposed Wastewater Treatment Plant constructed by the Township. A specific location for the plant was not chosen, but it was assumed that placing it on the west end of the lake would be most advantageous with a discharge line to Portage Lake. The assumption was made that the quality of wastewater effluent from this Township plant would need to be of the same quality as other Wastewater Treatment Plants discharging to a similar water body. For purposes of cost development, a preliminary estimate was completed for a treatment plant that would meet the same effluent parameters as the City of Manistee, which also disposes to (ultimately) Lake Michigan, albeit 20 miles south. For purposes of cost estimates, an Aero-Mod Plant was chosen due to the ability of adding on treatment capacity as the system grows, and due to its success in treating wastewater to a quality similar to that needed. The initial treatment capacity for the plant at the onset of the project was to be 180,000 gpd.

The total project cost for this option is approximately $8,310,000. A Preliminary Engineer's Estimate is located in Attachment 4 for reference.

B. Design Criteria:
   1. 1,000 REU's proposed initially, and 1,457 REU's proposed at full service area buildout.
   2. Each REU will contribute 167 gallons per day per RUS Bulletin 1780-2.
   3. Initial sewage flows anticipated at .18 MGD, future flows anticipated at 0.26 MGD.
   4. A preliminary design, equipment layout, and cost estimate was provided by Environmental Sales, who is a distributor for Aero-Mod Treatment Systems.
   5. Preliminary design assumes a surface discharge and is intended to meet standard discharge requirements for a surface water discharge in Michigan.
   6. Plant location is assumed to be between the two service areas, reducing distance the sewage needs to travel for treatment.
   7. Cost includes the force main from the collection system to the treatment plant and assumes approximately 8 miles of force main.

C. Map: A preliminary treatment facility layout of this alternative is shown in Attachment 6.

D. Environmental Impacts: Impacts for this option constructing a treatment facility, most likely on additional purchased properties. A discharge line would be required to release the treated water to a surface water. Impacts from the installation of the discharge line or delivery sewer (from collection to the treatment site) may arise. These routes may need to be adjusted once the full environmental review is completed.

E. Land Requirements: The force main route is within existing road rights-of-way, and treatment facility expansion is assumed to require up to 10 acres to be purchased for treatment and discharge facility. Land or easement may be needed for the duplex lift stations to get the sewage to the treatment site.

F. Construction Problems: Locating and acquiring land for this alternate may be challenging, although this option is not nearly as land intensive as the lagoon treatment options.

G. Sustainability Considerations:
   1. This alternative utilizes a new treatment plant between the two collection areas, reducing the pumping and force main length required.
   2. A surface water discharge will require pumping and a force main between the treatment and discharge sites.

H. Cost Estimates:
   1. Construction: $8,310,000
   2. Annual Operations and Maintenance: $312,000

- ***Treatment Alternative 4: Authority-Owned Wastewater Treatment Lagoons***

  Treatment of wastewater by a TLSA owned lagoon system would be very similar logistically and cost wise to connection to the Onekama Village system.

  Wastewater would be treated in multiple cells, stored during the non-discharge months and then disposed of by through spray irrigation on crop fields as close as possible to the lagoon site. The primary difference between this alternative and Alternative 2 is the connection costs and land costs proposed by the Village of Onekama.

  A preliminary design of a lagoon treatment system was performed and is included in Attachment 5. This alternative would place a large assumption that property can be secured to build new treatment and storage lagoons and the spray irrigation areas.

  The Preliminary Engineer's Estimate for this project can be reviewed in Attachment 4. The cost is estimated to be $13,646,000.

B. Design Criteria:
   1. 1,000 REU's proposed initially, and 1,457 REU's proposed at full service area buildout.
   2. Each REU will contribute 167 gallons per day per RUS Bulletin 1780-2.
   3. Initial sewage flows anticipated at .18 MGD, future flows anticipated at 0.26 MGD.
   4. It is assumed they would be allowed to irrigate May through October 31, same as the Village System.
   5. Includes force main collection system to proposed lagoon location assumed to be located between the two collection areas. Force main length is assumed to be approximately 8 miles.

C. Map: A schematic layout of this alternative is shown in Attachment 5.

D. Environmental Impacts: Impacts for this option include construction of a new treatment facility on multiple acquired properties. Impacts from the installation of the delivery sewer (from collection to the treatment site) may arise. This route may need to be adjusted once the full environmental review is completed.

E. Land Requirements: The force main route is within existing road rights-of-way, and treatment facility will require up to 160 acres to be purchased for treatment and irrigation disposal. Land or easement may be needed for the duplex lift stations to get the sewage to the treatment site.

F. Construction Problems: Locating and acquiring land for this alternate may be challenging. Some areas around the existing Onekama treatment site have been identified as having high nitrates, and most likely cannot be used for irrigation disposal, potentially limiting available properties.

G. Sustainability Considerations:

1. This alternative assumes the proposed treatment facility will be located between the two collection areas, reducing the pumping and force main length required.
2. Due to the lagoon treatment and irrigation disposal sites possibly being separated by a substantial distance, pumping and a force main may be required between the sites. We have assumed a distance of one mile for this report.

H. Cost Estimates:

1. Construction: $13,646,000
2. Annual Operations and Maintenance: $299,000

6.0 SELECTION OF AN ALTERNATIVE

6.1 PRESENT WORTH (LIFE CYCLE) COST ANALYSIS:

A Present Worth (life cycle) Cost Analysis has been performed for two (2) collection alternatives and four (4) treatment alternatives that were considered. The analysis entailed completing the Present Worth Analysis tables shown in Attachment 3. The collection analysis showed that the STEP alternative is the lowest cost. We used the STEP collection alternative in conjunction with the treatment alternatives to analyze the entire project for treatment alternatives. A summary matrix rating system is provided below.

6.2 MATRIX RATING SYSTEM OF PRESENT WORTH COST ANALYSIS:

Following are two (2) matrixes showing the results of the Present Worth Analysis. The first matrix shows the results of the collection alternatives analysis, and the second matrix shows the results of the treatment alternatives analysis.

Table 6-1 Matrix of Collection System Costs

	Alternative No. 1: STEP Collection	Alternative No. 2: Low Pressure System w/ Grinder Pumps
Initial Capital Costs =	$27,383,000	$29,583,000
Annual Operations & Maintenance Costs =	$390,000	$420,000
Future Salvage Value =	$50,000	$50,000
Present Worth of 40 years of O & M =	$8,459,218	$9,109,927
Present Worth of 40-year Salvage Value =	$13,126	$13,126
Total Present Worth =	$35,829,092	$38,679,801
Funds to Set Aside Yearly For Short Lived Depreciated Assets =	$109,000	$139,000

Table 6.2 Matrix of Treatment Alternatives Cost				
	Alternative No. 1: Connection to LRBOI WWTF	Alternative No. 2: Connection to Onekama Village WWTF	Alternative No. 3: TLSA Mechanical WWTP	Alternative No. 4: TLSA Lagoon WWTF
Initial Capital Costs =	$35,215,000	$41,310,000	$35,694,000	$41,030,000
Annual Operations & Maintenance Costs =	$983,600	$718,000	$702,000	$689,000
Future Salvage Value =	$10,000	$200,000	$80,000	$200,000
Present Worth of 40 years of O & M =	$21,334,582	$15,582,314	$15,226,593	$14,944,619
Present Worth of 40-year Salvage Value =	$2,625	$52,506	$21,002	$52,506
Total Present Worth =	$56,546,957	$56,839,808	$50,899,590	$55,922,113
Funds to Set Aside Yearly For Short Lived Depreciated Assets =	$20,000	$34,000	$27,000	$34,000

7.0 PROPOSED PROJECT (STEP COLLECTION & MECHANICAL WWTP)

7.1 PROJECT DESIGN

1. Collection: Every connection will utilize an existing or newly installed septic tank to remove solids, then a pump within the septic tank will send the liquid waste into a low-pressure collection system. The collection system will have intermediate lift stations to assist the flow over the long distances around the collection areas. Ultimately the flow for each lake area will culminate at a single duplex lift station where it will be transferred to the WWTF. Service lines and the low-pressure collection mains will be directionally drilled where possible, reducing disturbance to roads, driveways and service connection areas. Restoration is assumed at each service connection and at intervals along the length of the collection main to account for bore and receiving pit restoration.
2. Transmission Force Main: A Transmission force main will move the waste from the collection areas to the WWTF location which is assumed to be located between the two collection areas. Additional lift stations are assumed to be required due to the elevation rise between the two collection locations. The transmission main is anticipated to be installed by directional drilling.
3. Treatment: A mechanical Areo-Mod WWTP is the most cost-effective treatment alternative based on this preliminary report. This plant primarily utilizes aeration to treat the wastewater and has been effectively used in other local municipalities. A site between the two collection systems is assumed as a specific location has not yet been determined.

7.2 TOTAL PROJECT COST ESTIMATE

An itemized estimate of the project cost is attached in Attachment 4.

7.3 ANNUAL OPERATING BUDGET

The proposed rate schedule will be dependent upon the amount of grant and loans can be obtained through Rural Development. Once a statement from RD defining anticipated funding levels has been received this section can be completed.

7.4 OPERATIONS AND MAINTENANCE (O&M) COSTS

Operation and maintenance costs are provided for the selected alternative and can be seen in Attachment 4. Based upon an initial 1,000 connections, each user could anticipate costs of approximately $700 per year or $60 per month. The above includes anticipated costs associated with the operation and maintenance of the proposed facilities including wages, benefits, supplies, and repair of equipment.

7.5 DEBT REPAYMENTS

The proposed debt repayment will be dependent upon the amount of grant and loans that can be obtained through Rural Development. Once a statement from RD defining anticipated funding levels has been received this section can be completed.

7.6 RESERVES

The proposed amount of reserves required will be dependent upon the amount of grant and loans that can be obtained through Rural Development. Once a statement from RD defining anticipated funding levels has been received this section can be completed.

ATTACHMENT 1
SERVICE DISTRICT MAPS AND PARCEL LISTS

N

800 400 0 800 1600

SCALE IN FEET

= SANITARY SEWER COLLECTION DISTRICT BOUNDARY LINE

= PARCEL WITHIN DISTRICT

LAKE MICHIGAN

STATE OF MICHIGAN

NORTH POINT PARK

PORTAGE POINT INN CONDO'S

VILLAGE OF ONEKAMA

PORTAGE LAKE

CAMP TOSEBO

PORTAGE LAKE COVENANT BIBLE CAMP

PIRATES COVE CONDO'S,

SHAY'S CHOP HOUSE RESTAURANT

MANISTEE COUNTY FAIRGROUNDS

REV#	DATE	DESCRIPTION	BY
2	2/5/2019	SEWER DISTRICT BOUNDARY	
1	3/4/2018	SERVICE AREA BOUNDARY	

WADE TRIM

10850 East Traverse Highway, Suite 2260
Traverse City, MI 49684
231.947.9680
www.wadetrim.com

TWO LAKES SEWER AUTHORITY
5435 MAIN ST
ONEKAMA, MI 49675

SEWER STUDY FOR USDA FINANCING APPLICATION
PORTAGE LAKE AREA SERVICE DISTRICT

ISSUED FOR: DATE: BY:

JOB NO. TLS2001.01C

SHEET PL

PROJECT MANAGER: BRIAN SOUSA, PE
C:\PW_WORK\KSCHWERDT@WADETRIM.COM\D0878763\CSP-PLTS-PROJECTOVERVIEW.DWG - PL - PLOTTED 6/5/2019 9:34 AM BY SCHWERDT, KENNETH
FIELD BOOK INFORMATION:

N

600 300 0 600 1200

SCALE IN FEET

= SANITARY SEWER COLLECTION DISTRICT BOUNDARY LINE

= PARCEL WITHIN DISTRICT

NORCONK RD

IVERSON RD

MYERS RD

BUTWELL RD

BIG BAY RD

3 PINES RD

BAIR AVE

LAKESIDE AVE

US 31

BEAR LAKE

PLEASANTON TOWNSHIP

BEAR LAKE TOWNSHIP

13 MILE RD

HOPKINS FOREST

MILARCH RD

SOUTH SHORE DR

12TH ST

7TH ST

LINDERMAN RD

POTTER RD

MAIN ST

STUART ST

SMITH ST

CODY ST

VILLAGE OF BEAR LAKE

RUSSELL ST

REV#	DATE	DESCRIPTION	BY
2	2/5/2019	SEWER DISTRICT BOUNDARY	
1	3/4/2018	SERVICE AREA BOUNDARY	

WADE TRIM

10850 East Traverse Highway, Suite 2260
Traverse City, MI 49684
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TWO LAKES SEWER AUTHORITY
5435 MAIN ST
ONEKAMA, MI 49675

SEWER STUDY FOR USDA FINANCING APPLICATION
BEAR LAKE AREA SERVICE DISTRICT

ISSUED FOR: DATE: BY:

JOB NO. TLS2001.01C

SHEET BL

PROJECT MANAGER: BRIAN SOUSA, PE
FIELD BOOK INFORMATION:
C:\PW_WORK\KSCHWERDT@WADETRIM.COM\D0878763\CSP-PLTS-PROJECTOVERVIEW.DWG - BL - PLOTTED: 2/22/2019 9:22 AM BY SCHWERDT, KENNETH

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-032-005-00	CARTER WILLIAM & SUE TRUST &	1980 CRESCENT BEACH RD	2
11-032-005-10	MAYLEN DAVID M III & ELAINE R	7810 EDGEWATER	1
11-032-005-15	FOX CAROL C SWAN TRUST		1
11-032-005-20	ACTON EDWARD TR & ACTON MARGARET TR		1
11-032-005-25	ACTON EDWARD TR & ACTON MARGARET TR		1
11-032-006-00	BERKLUND KEVEN & ARLENE (LE) &TRUST	1969 CRESCENT BEACH RD	2
11-032-007-00	KIESLER GEORGE & KUST AMY & ETAL	1963 CRESCENT BEACH RD	1
11-032-008-00	BERKLUND KEVEN & ARLENE (LE)&TRUST	1955 CRESCENT BEACH RD	1
11-033-001-05	GARBRECT ALLEN & BONNIE TRUST	1985 SECOND ST	1
11-033-002-00	HARDENBERGH JORDON T &JACQUELINE T		1
11-033-003-50	HARDENBERGH LEWIS R TRUST	2290 CRESCENT BEACH RD	1
11-033-003-60	BROOKS WENDELL M & KARIN	1971 SECOND ST	2
11-033-004-05	HARDENBERGH JOHN T (LE) TRUST	2370 CRESCENT BEACH RD	2
11-033-004-15	HARDENBERGN JOHN T (LE) TRUST	2340 CRESCENT BEACH RD	1
11-033-004-20	BROOKS STEVEN NATHAN &	1931 SECOND ST	1
11-033-004-25	BROOKS BRUCE ALEXANDER & SUSAN ANNE	1961 SECOND ST	1
11-033-009-00	ASCHAUER MARTIN & ANN	2438 CRESCENT BEACH RD	1
11-033-009-10	NORBECK DANIEL W & CYNTHIA L	2398 CRESCENT BEACH RD	2
11-033-011-00			1
11-033-012-00	GRIFFITHS MARY		1
11-033-013-00	ASCHAUER MARTIN & ANN		1
11-033-014-00			1
11-033-014-03	GRASSA ROBERT TRUST (LE) &	2570 CRESCENT BEACH RD	1
11-033-014-05	GILBERT ROY N & CONSTANCE L		1
11-033-014-07	PRATT JAMES M & JANET E	2642 CRESCENT BEACH RD	1
11-033-014-10			1
11-033-014-20			1
11-033-015-00	SCOTT MICHAEL T	2536 CRESCENT BEACH RD	1
11-033-016-10			1
11-033-016-20			1
11-033-018-05	HENSEL LYNISE TRUST		1
11-033-018-10	CENTILLION GROUP LLC	2768 CRESCENT BEACH RD	1
11-033-018-15	HENSEL LYNISE TRUST		1
11-033-018-20	GRIFFITHS MARY N		1
11-033-020-00	SCRUGGS LESLIE S & JACQUELYN S		0
11-034-001-00	PORTAGE PROPERTIES LLC	3452 CRESCENT BEACH RD	1
11-034-002-00	TOMLINSON RICHARD G TRUST	3498 CRESCENT BEACH RD	1
11-034-003-00	BOGAERT FREDERICK A TRUST	3380 CRESCENT BEACH RD	1
11-034-004-00	MAY DOUGLAS A TRUST		1
11-034-004-10	MAY DOUGLAS A TRUST	3300 CRESCENT BEACH RD	1
11-034-004-20	MAY DOUGLAS A TRUST		0
11-034-005-00	BOGAERT FREDERICK A TRUST		1
11-034-006-00	CALAIS TIMOTHY R TRUST &	3246 CRESCENT BEACH RD	2
11-034-006-10	BARZ MARILYN TRUST	3244 CRESCENT BEACH RD	1
11-034-007-00	RISSER DENNIS & PATSY	3248 CRESCENT BEACH RD	1
11-034-009-00	SOET JAMES R (LE) TRUST &	3198 CRESCENT BEACH RD	1
51-252-001-00	BALDWIN JAMES C & DEBRA S	1 HARBOR POINT LN	1
51-252-001-00	BALDWIN JAMES C & DEBRA S	1 HARBOR POINT LN	1
11-034-010-00	MAY NANCY E TRUST	3180 CRESCENT BEACH RD	1
11-034-011-00	BENEKE HENRY III TRUST	3162 CRESCENT BEACH RD	1
11-034-012-00	LINDBERG EDWARD & MARY	3140 CRESCENT BEACH RD	1.5
11-034-012-10	AGERSON KIRK & CATHY (LE) TRUST	3136 CRESCENT BEACH RD	2
11-034-013-00	ANDERSON ROBERT & AMY	3122 CRESCENT BEACH RD	1
11-034-014-00	LOYNES JACK L & KATHLEEN A TRUST	3100 CRESCENT BEACH RD	1
11-034-016-10	HENSINGER IRENE DEVAUX	3011 CRESCENT BEACH RD	0
11-034-020-00	GODZINA LAYNE C & JANA L TRUST	3801 KENDALL ST	1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-034-020-50	SCHIMKE LARRY LEE & MARTHA ANN	3835 KENDALL ST	1
11-034-021-00	MARTIN MARIETTA MAGNESIA SPECIALTIE		1
11-034-021-10	PETERSON MILTON O JR &	7429 LEONARD AV	1
11-034-023-00	CICHY MICHAEL & NANCY D	7449 LEONARD AV	1
11-034-024-00			1
11-034-025-00	GEM PARTNERSHIP		1
11-034-026-00	BROMLEY WILLIAM H & NANCY J		1
11-035-021-00	VASILNEK KENNETH R & CYNTHIA M	4507 CRESCENT BEACH RD	1
11-035-021-05	GEORGE LEE F & CARMEN M	4513 CRESCENT BEACH RD	1
11-035-021-10	BURRUS CAROLYN J TRUST	4511 CRESCENT BEACH RD	1
11-035-023-00	WISNISKI JAMES L SR & YOLANDA	4595 CRESCENT BEACH RD	1
11-035-023-05	HASKE MICHAEL GARY & AMY	4631 CRESCENT BEACH RD	1
11-035-023-15	GREEN DENNIS W	4599 CRESCENT BEACH RD	1
11-035-024-00	IOCCO DOMINIC A & HAVEY ADAM R	4519 CRESCENT BEACH RD	1
11-035-025-00	HENGY LISA A	4729 CRESCENT BEACH RD	1
11-035-025-10	MACARTHUR BRENT & RASHEL	4735 CRESCENT BEACH RD	1
11-035-027-00	ZIMMERMAN ROGER &	4522 CRESCENT BEACH RD	1
11-035-028-00	MARLETT PAUL & PAMELA	4532 CRESCENT BEACH RD	1
11-035-029-00	BIRD ROBERT A & JULIA L	4554 CRESCENT BEACH RD	1
11-035-030-00	WISNISKI JAMES & YOLANDA & SKYLAR	4751 CRESCENT BEACH RD	1
11-035-031-00	VANDENBERG CHARLES IV & RACHEL	4807 CRESCENT BEACH RD	1
11-035-031-10	WILLINGER MICHAEL SR		1
11-035-032-05	BROWN GREGORY A & SALLY J	4781 CRESCENT BEACH RD	1
11-035-032-10	ROBINSON NATHAN & SHELLEY	CRESCENT BEACH RD	1
11-035-032-15	TENNANT DARWIN		0
11-035-033-00	LIBEY TAMMY L &	4849 CRESCENT BEACH RD	1
11-035-033-05	READ JUDY R TRUST		0
11-035-033-10	PEPPERS EVA JEAN		1
11-035-034-00	BEARDSLEE MARY I	7198 FARR RD	1
11-035-034-05	ZELLER JEFFREY ALLEN & SARA		1
11-035-035-20	ZELLER JEFFREY ALLEN & SARA		1
11-035-037-00	SCHROEDER PAMELA M TRUST	4829 CRESCENT BEACH RD	1
11-035-038-00	WILKOSZ DANIEL S & MARY KAYE &	4941 CRESCENT BEACH RD	1
11-035-039-00	ENGLISH FRANK & LINDA	4861 CRESCENT BEACH RD	1
11-035-040-00	BRZESKI ROBERT ETAL	4968 CRESCENT BEACH RD	1
11-035-041-00	ROSS ERIC J	4985 CRESCENT BEACH RD	1
11-035-042-00	WEST SHORE BANK	4427 CRESCENT BEACH RD	1
11-036-004-00	BINGHAM BARBARA MULBERRY (LE)	7865 FIRST ST	1
11-036-005-00			1
11-036-006-00	MANISTEE COUNTY	7545 FIRST ST	1
11-036-007-05	MANTHEY JOHN & DEBBIE, PEPERA LISA		1
11-036-009-00	BEHLING BARBARA J	5307 CRESCENT BEACH RD	1
11-036-010-00	CLEMENT ROLAND E & MARLENE	5240 CRESCENT BEACH RD	1
11-036-011-00	ACKER WILLIAM H ET UX	5264 CRESCENT BEACH RD	1
11-036-012-00	MADSEN CHARLES CRESCENT BEACH TRUST	5290 CRESCENT BEACH RD	1
11-036-013-00	MCCARTHY DENNIS B TRUST	5061 CRESCENT BEACH RD	1
11-036-014-00	CRUICE TERRENCE & GLORIA	5016 CRESCENT BEACH RD	1
11-036-015-00	MCCARTHY DENNIS B TRUST		1
11-036-016-00	HARRISON ELIZABETH ANNE (LE) &TRUST	5224 CRESCENT BEACH RD	1
11-036-017-00	WEBSTER DENNIS & LAURI	5196 CRESCENT BEACH RD	1
11-045-002-00	PLAGANY THOMAS C & ELAINE W	4472 CRESCENT BEACH RD	1
11-045-004-00	STANDALE LUMBER CO		1
11-045-004-01			1
11-045-004-02			1
11-045-004-03			1
11-045-004-04			1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-045-004-05			1
11-045-004-06			1
11-045-004-07			1
11-045-004-08			1
11-045-004-09			1
11-045-004-10			1
11-045-004-11			1
11-045-004-12			1
11-045-004-13			1
11-045-004-14			1
11-045-004-15			1
11-045-004-16			1
11-045-004-17			1
11-045-004-18			1
11-045-004-19			1
11-045-005-00	MROZINSKI JAMES A TRUST	4366 CRESCENT BEACH RD	1
11-045-006-00	ONEKAMA MARINE INC	4378 CRESCENT BEACH RD	1
11-045-007-00	MROZINSKI JAMES A TRUST		1
11-045-008-00	FEAGINS HARLESS W JR &	7397 ELLEN RD	1
11-045-009-00	FEDERAL HOME LOAN MORTGAGE CORP	7419 ELLEN RD	1
11-045-010-00	MARKOWSKI THOMAS P & BETH A TRUST	7447 ELLEN RD	1
11-045-011-00	GREAT LAKES CONFERENCE OF	7475 ELLEN RD	1
11-050-001-00	HARTRICH NELSON TRUST	3060 CRESCENT BEACH RD	1
11-050-002-00	BUCHHOLZ ROBERT J & JEANINE S	7384 SECOR AV	1
11-050-003-00	BUCHHOLZ ROBERT & JEANINE	CRESCENT BEACH RD	1
11-050-004-00	NOONAN JAMES & LAUREL (LE) ETAL		1
11-050-005-00	RIDGELAND PARTNERSHIP	7375 CRON AV	1
11-050-006-00	NOLLINGER EDWARD J & KAREN A	7384 CRON AV	1
11-050-007-00	FISHER SUSAN K TRUST	7362 CRON AV	1
11-050-008-00	NOONAN JAMES & LAUREL (LE) ETAL	7338 CRON AV	1
11-050-009-00	LOYNES JACK L (LE) &LOYNES GRIFFIN&	3004 CRESCENT BEACH RD	1
11-050-010-00	POELLET BEVERLY (LE) &	2992 CRESCENT BEACH RD	1
11-050-011-00	HUGHES ROBERT C &	7333 C.G. DAVIS AV	1
11-050-012-00	HARTRICH NELSON TRUST	7337 C.G. DAVIS AV	1
11-050-013-00	BRANDENBURG CRAIG G	7361 C.G. DAVIS AV	1
11-050-015-00	TARANDA/BALDWIN TRUST	7375 C.G. DAVIS AV	2
11-050-018-00	SCRUGGS LESLIE S & JACQUELYN	7187 MILLER RD	1
11-050-019-00	SCRUGGS LESLIE		1
11-050-020-00	SCRUGGS LESLIE & JACQUELINE		1
11-050-023-00	HORTON CATHERINE & LUCAS JODI &	7376 C.G. DAVIS AV	1
11-050-024-00	BALDWIN EDWARD ETAL	7360 WM FORTH AV	1
11-050-025-00	BERMES MARK & JEANINE TRUST	7334 WM FORTH AV	1
11-050-026-00	PROBECK EDWIN J III & ETAL	2942 CRESCENT BEACH RD	1
11-050-027-00	PAZ LAZARO & ANA	2924 CRESCENT BEACH RD	1
11-050-028-00	PAZ LAZARO & ANA	7341 SANSOUSA ST	1
11-050-029-00	PAZ LAZARO & ANA	7355 SANSOUSA ST	1
11-050-030-00	MOHNEY C BLAIR & GINGER J	2907 LAKETON CT	1
11-050-031-00	MCCARTHY ALAN & GLADYS	7362 SANSOUSA ST	1
11-050-032-00	KRULL DAWN R & KRULL JAMES M	7340 SANSOUSA ST	1
11-050-033-00	ROSENGREN RONALD & CHRISTINE &	2926 CRESCENT BEACH RD	1
11-050-034-00	BARIBEAU JOHN L (LE) & TRUST	2886 CRESCENT BEACH RD	1
11-050-035-00	KEMP WALLACE & NOEL TRUST	7375 HOLLOWED ST	1
11-050-036-00	BARIBEAU JOHN L (LE) & TRUST	7358 HOLLOWED ST	1
11-050-037-00	BARIBEAU JOHN L (LE) & TRUST		1
11-411-031-00	CONLEY CONSTANCE & DUDLEY		1
11-050-038-10	KEMP WALLACE B & NOEL B TRUST	2898 LAKETON CT	1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-050-043-00	CENTILLION GROUP LLC	CRESCENT BEACH RD	0
11-050-062-00	CENTILLION GROUP LLC	CRESCENT BEACH RD	0
11-050-063-00	HOLLOWED FAMILY CORP	2820 CRESCENT BEACH RD	1
11-050-064-00	STONE MARY K TRUST	2840 CRESCENT BEACH RD	2
11-050-065-00	GLEESON DAVID & BARIBEAU COLLEEN	7400 MOREY ST	1
11-050-065-10	BARIBEAU JOHN L (LE) & TRUST		1
11-050-070-00	HORTON CATHERINE & LUCAS JODI &		1
11-050-072-00	DIJAK TIMOTHY J & ANGELA J	7401 C.G. DAVIS AV	1
11-050-073-00	FOX LAURENCE	2972 CRESCENT BEACH RD	1
11-095-000-00	TOSEBO CLUBHOUSE LLC		1
11-095-004-00	DARPEL STEPHEN & KRISTY TRUST		1
11-095-005-00	SCHROCK MARK R TRUST &	7174 MILLER RD	1
11-095-006-00	BROWN GREGORY & SALLY	7178 MILLER RD	1
11-095-007-00	TOSEBO CLUBHOUSE LLC	7228 MILLER RD	1
11-095-008-00	BEEHIVE LLC		1
11-130-001-00	MORTENSON G DOUGLAS &SALLY L TRUST	4008 CAMP DELIGHT RD	1
11-130-003-00	KOWALSKI SUZANNE TRUST	4022 CAMP DELIGHT RD	2
11-130-006-00	GILES PETER W & DAWN F	4046 CAMP DELIGHT RD	1
11-130-008-00	GILES CYNTHIA	4070 CAMP DELIGHT RD	2
11-130-014-00	GREAT LAKES CONF OF EVANGELICAL	4158 CAMP DELIGHT RD	1
11-130-014-10	MANISTEE COUNTY ROAD COMMISSION	7415 SOUTH CAMP DELIGHT RD	1
11-130-031-00	GREAT LAKES CONF OF EVANGELICAL		1
11-170-001-00	MILLER ALBERT TRUST	ELLEN RD	1
11-170-002-00	GREAT LAKES CONF OF EVANGELICAL		1
11-170-005-00	GILES CYNTHIA		1
11-170-006-00	MANISTEE COUNTY ROAD COMMISSION	4093 SOUTH CAMP DELIGHT RD	1
11-250-001-00	SEYMOUR BARRY E SR &PIENTA JOSEPH A	5535 JOHN ST	1
11-250-005-00	MANISTEE COUNTY	5617 JOHN ST	1
11-250-007-10	MANISTEE COUNTY		0
11-250-008-10	VANEERDEN DAVID J & MALVINA J	5665 JOHN ST	1
11-250-009-00	MANISTEE COUNTY		1
11-250-011-00	LEDDY EDWARD H	7612 KAY ST	1
11-250-013-00	DELEON MICHAEL & AMY	7572 KAY ST	1
11-250-015-00	MANISTEE COUNTY		1
11-250-016-00	MANISTEE COUNTY		1
11-250-018-00	JOHNSON HELMER & LINDA		1
11-250-019-00	MEISTE ROBIN J &	5744 JONES RD	1
11-250-020-00	JOHNSON BEVERLY	7555 KAY ST	1
11-250-021-01	JOHNSON LINDA M		1
11-250-022-01	MANTHEY JOHN R & DEBBIE S &	7611 KAY ST	1
11-250-024-00	ONEKAMA TOWNSHIP		1
11-250-026-00	CHMIELEWSKI JOHN & CHRISTINE		1
11-250-028-00	7725 KAY LLC	7725 KAY ST	1
11-250-029-00	7725 KAY LLC		1
11-250-030-00	KLINE REBECCA R TRUST		1
11-250-031-00	CHMIELEWSKI JOHN & CHRISTINE		1
11-250-032-00	LEYVA EULALIO & PAULA J		1
11-250-033-00	RINGEL ROGER ET UX		1
11-250-036-00	BAKER ROBERT H & LOIS J TRUST	5578 JOHN ST	1
11-250-038-00	MANISTEE COUNTY		1
11-250-039-00	MANISTEE COUNTY		1
11-250-040-00	MANISTEE COUNTY		1
11-280-001-00			1
11-280-002-00			1
11-280-003-00			1
11-280-004-00			1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-280-005-00			1
11-280-006-00			1
11-290-027-00	ONEKAMA TOWNSHIP		1
11-290-028-00	ONEKAMA TOWNSHIP		1
11-290-029-00	ONEKAMA TOWNSHIP		1
11-290-030-00	PALDAN DARRYL D & SANDRA M		1
11-290-035-05	PALDAN DARRYL D & SANDRA M		1
11-290-035-10	ONEKAMA TOWNSHIP		1
11-290-036-00	ONEKAMA TOWNSHIP		1
11-290-037-00	KEMPERMAN RICHARD & CHERYL		1
11-290-038-00	KEMPERMAN RICHARD & CHERYL ANN		1
11-290-039-00	JOHNSON JANE M		1
11-290-040-00	JOHNSON JANE M		1
11-290-041-00	JOHNSON JANE M	8951 BAYVIEW RD	1
11-290-043-00	SCHAFER RALPH		1
11-290-044-00	KEMPERMAN RICHARD & CHERYL	8883 BAYVIEW RD	1
11-290-045-00	LANDON SUSAN	8891 BAYVIEW RD	1
11-290-046-00	STEINMEYER WILLARD F & MEGHAN B	8909 BAYVIEW RD	1
11-290-047-00	REINKE ROGER M & NOLA A	8911 BAYVIEW RD	1
11-290-048-00	JOHNSON JANE M		1
11-290-050-00	ONEKAMA TOWNSHIP		1
11-290-051-00	ONEKAMA TOWNSHIP		1
11-290-052-00	ONEKAMA TOWNSHIP		1
11-290-066-00	BEZESKY JOHN & BEZESKY DAVID M	8640 BAYVIEW RD	1
11-290-067-00	KROLCZYK JACQUELYN N	8626 BAYVIEW RD	1
11-290-067-20	VAN DER HULST A WAYNE &		1
11-290-068-00	MAIN DONALD E TRUST		1
11-290-069-00	MAIN DONALD TRUST &		1
11-290-071-00	GOODMAN DEBRA J &	8536 BAYVIEW RD	1
11-290-072-00	CRANDALL JEFFERY &	8548 BAYVIEW RD	1
11-290-073-00	KROLCZYK MARY ANN TRUST &	8558 BAYVIEW RD	1
11-290-074-00	HANZEL JANET	8566 BAYVIEW RD	1
11-290-075-00	MCISAAC MARK A &	8588 BAYVIEW RD	1
11-290-076-00	TABACZKA KEVIN & GRETCHEN	8600 BAYVIEW RD	1
11-290-077-00	STATE OF MICHIGAN		1
11-290-084-00	MESSNER JAMES WILLARD TR	3219 MIDWAY DR	1
11-290-085-00	MESSNER JAMES WILLARD TR		0
11-290-088-00	MESSNER JAMES WILLARD TR		1
11-290-089-00	MAJOR JAMES TRUST &	8448 BAYVIEW RD	1
11-290-091-00	MAJOR DEBORAH TRUST &		1
11-290-093-00	SANCHEZ JESSE & KARINDA		1
11-290-094-00	MAKOWIEC RICHARD & ANGELA		1
11-290-095-00	MAKOWIEC RICHARD & ANGELA		1
11-290-096-00			2
11-290-097-00			1
11-290-098-00			1
11-290-099-00			1
11-290-100-00			1
11-290-101-00			1
11-290-102-00			1
11-290-103-00			1
11-290-104-00	TAMULIS WALTER W & CAROL ANN		1
11-290-105-00	ADAMS JEAN C		1
11-290-106-00	DND OLSON FARM LLC		1
11-290-107-00	KELLER ERIC E & TRISHA L		1
11-290-108-00	WEBB HUGH & WEBB GWENDOLYN	8350 FAIRWAY WEST	1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-290-109-00	HALLAS DON & CYNTHIA		2
11-290-109-10	COOPER MELINDA MARY		1
11-290-110-00	ALAM JAMIL & ALAM LAURA	FAIRWAY WEST	1
11-290-112-00	KROLCZYK MARY ANN (HERKELRATH) TR		1
11-290-113-00	COOPER MELINDA MARY		1
11-290-114-00	BRUNSON BRUCE W (LE) &		1
11-290-115-00	O'CONNOR GERALD P TRUST		1
11-290-116-00	KROLCZYK JACQUELYN &		1
11-290-117-00	YANG CHANG		1
11-290-117-10	YANG CHANG		1
11-290-117-20	ADAMS JOHN F TRUST		1
11-290-119-00	WARD MICHAEL V & SUSAN		1
11-290-121-00	ADAMS RONALD W & CYNTHIA		1
11-290-122-00	ADAMS RONALD		1
11-290-123-00	ZANDER THOMAS & ROBERTA		1
11-290-124-00	ZANDER THOMAS ROBERT &ROBERTA ANN		1
11-290-125-00	CORONELLA JOSEPH T		1
11-290-126-00	CORONELLA JOSEPH T		1
11-290-127-00	ZANDER TOM R & ROBERTA A		1
11-290-128-00			1
11-290-129-00			1
11-290-129-05			1
11-290-129-10			1
11-290-129-15			1
11-290-129-20			1
11-290-130-00			1
11-290-131-00			1
11-290-131-10			1
11-290-132-00			1
11-290-133-00			1
11-290-135-00	COLE HEATHER	8573 FAIRWAY WEST	1
11-290-136-00	FRANCK HAZEL D & FRANCK JAN	8603 FAIRWAY WEST	1
11-290-137-00	ADAMS RONALD W & CYNTHIA	8629 FAIRWAY WEST	1
11-290-138-00	STATE OF MICHIGAN		1
11-290-139-00	KC9 ENTERPRISES LLC		1
11-290-140-00	AMMON SCOTT H & BRENDA B	8580 FAIRWAY WEST	1
11-290-141-00	PIOTROWSKI JEROME TRUST		1
11-290-142-00	HARVEY GEORGE & MARIANN	8614 FAIRWAY WEST	1
11-290-144-00	STATE OF MICH		1
11-290-146-00	SCARNAVACK JOHN C & KIMBERLY A	8566 FAIRWAY WEST	1
11-290-147-00	HANSEN MARTIN B & ARLENE M	8807 LAKE PARK DR	1
11-290-148-10	HURFORD JONATHAN P & TRACEY A	8761 LAKE PARK DR	1
11-290-148-20			1
11-290-150-00			1
11-290-150-10	PAKULAK JAMES & NANCY	LAKE PARK DR	1
11-290-151-00	BERGQUIST KARLTON JR & BETSY TRUST		1
11-290-151-10	BERGQUIST KARLTON JR & BETSY TRUST		1
11-290-153-00	HEGGELAND JACK TRUST	2811 SEYMOUR ST	1
11-290-154-00	HOUCK RICHARD TRUST.		1
11-290-155-00	GREENHALGH TRUST		1
11-290-156-00	DUTKAVICH LAVERN E &	8685 FERNDALE DR	1
11-290-157-00	DUTKAVICH LAVERN E		1
11-290-158-00	KRAUSE ARNOLD & MARLENE		1
11-290-158-10	DND OLSON FARM LLC		1
11-290-159-00	DND OLSON FARM LLC		1
11-290-160-00	ONEKAMA TOWNSHIP		1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-290-161-00	WADE FAMILY PARTNERS LTD		1
11-290-162-00	EVANS ROBERT M TRUST &	8717 JUNIPER WY	1
11-290-163-00	EVANS ROBERT M TRUST &		1
11-290-164-00	HANSEN ROBERT & R CAROL	8714 FERNDALE DR	1
11-290-166-00	WADE FAMILY PARTNERS LTD	2721 SEYMOUR ST	1
11-290-168-00	WADE FAMILY PARTNERS LTD	8793 ARBORVITAE	1
11-290-169-00	WADE FAMILY PARTNERS LTD		1
11-290-170-00	WADE FAMILY PARTNERS LTD	8685 JUNIPER WY	1
11-290-171-00	HARTRICH NELSON E ETAL		1
11-290-172-00	MURRAY MARGARET PARK	8752 JUNIPER WY	1
11-290-173-00	ANDERSON GARY & BARB		1
11-290-174-00	SIMONS VAUGHN & LINDA		1
11-290-175-00	WADE FAMILY PARTNERS LTD		1
11-290-176-00	BURCH JANET M ETAL		1
11-290-177-00	PIERCE PATRICIA & ROBERT	2680 LAKEVIEW RD	2
11-290-177-10	BERNARD FAMILY RETREAT LLC	8853 ARDMORE DR	1
11-290-177-15	BERNARD LAKEHOUSE LLC	8860 ARBORVITAE	1
11-290-177-20	BERNARD FAMILY RETREAT LLC		1
11-290-177-25	BERNARD LAKEHOUSE LLC		1
11-290-178-00	GREENHALGH TRUST		1
11-290-178-04	GREENHALGH TRUST		1
11-290-179-00	LE SARGE CATHERINE K		1
11-290-180-00	LE SARGE CATHERINE K		1
11-290-181-00	GREENHALGH TRUST		1
11-290-182-00	SEDLAR PHILIP P		1
11-290-183-00	LESARGE EARL & BEVERLY (LE) &		1
11-290-184-00	STEINMEYER MEGHAN B & WILLARD F		1
11-290-185-00	STEINMEYER MEGHAN B & WILLARD F		1
11-290-186-00	ARMOUR THOMAS L & ALEXEA	8899 ARBORVITAE	1
11-290-187-00	LESARGE CATHERINE & LESARGE MICHAEL	2724 SEYMOUR ST	1
11-290-188-00	FERRY BRUCE A		1
11-290-189-00	LESARGE CATHERINE K		1
11-290-190-00	LESARGE CATHERINE K		1
11-290-191-00	STEINMEYER WILLARD F & MEGHAN B		1
11-290-192-00	STEINMEYER WILLARD F & MEGHAN B		1
11-290-193-00	KOMAR WALTER TRUST	8963 JUNIPER WY	1
11-290-193-50	COZZIE ELIZABETH L &	8888 FERNDALE DR	1
11-290-194-01	SOLID COMFORT LC		1
11-290-195-00	WEBB SCOTT THOMAS		1
11-290-196-00	WEBB SCOTT THOMAS		1
11-290-199-00	HERZOG JOHN P & SUSAN B		1
11-290-200-00	SIMUTIS ROBERT & EVA	8963 FERNDALE DR	1
11-290-200-10	COZZIE ELIZABETH L &		1
11-290-200-15	FISCHER JOHN F		1
11-290-200-20	COZZIE ELIZABETH L &		1
11-290-201-00	GREEN MARSHA A TRUST		1
11-290-203-05	SIMUTIS ROBERT P & EVE M	8898 LAKE PARK DR	1
11-290-204-00	PHEBUS AMY M &		1
11-290-205-20	HARTMAN PHIL L ETAL	8895 LAKE PARK DR	1
11-290-206-00	HARTMAN PHIL & LINDA		1
11-290-207-00	SALZER DAVID & SHELLY	LAKE PARK DR	1
11-290-208-00	DND OLSON FARM LLC		1
11-290-209-00	WILCOX MARK & SANDRA		1
11-290-210-00	HANSON DIANE M		1
11-290-211-00	HARTMAN PHIL & LINDA S		1
11-290-212-00	LESARGE CATHERINE & LESARGE MICHAEL		1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-290-269-00	WOOD RANDOLPH H TRUST		1
11-290-270-00	WOOD RANDOLPH G TRUST		1
11-290-271-00	WOOD RANDOLPH G TRUST		1
11-290-272-00	WOOD RANDOLPH G TRUST		1
11-290-273-00	WOOD RANDOLPH G TRUST		1
11-290-274-00	ONEKAMA TOWNSHIP		1
11-290-276-00	WOOD RANDOLPH G TRUST		1
11-290-292-00	ONEKAMA TOWNSHIP		1
11-290-293-00	KELLY JACQUELINE M TRUST		1
11-290-294-00	TOWNSHIP OF ONEKAMA		1
11-290-295-00	TOWNSHIP OF ONEKAMA		1
11-290-295-06	WOOD RANDOLPH G TRUST		1
11-290-296-00	WOOD RANDOLPH G TRUST		1
11-290-297-00	WOOD RANDOLPH G TRUST		1
11-290-297-10	KUNCAITIS FAMILY TRUST	9102 BAYVIEW RD	1
11-290-298-00	WOOD RANDOLPH G TRUST		1
11-290-299-00	WOOD RANDOLPH G TRUST		1
11-290-309-00			1
11-290-310-00			1
11-290-311-00			1
11-290-312-00			1
11-290-313-00			1
11-290-314-00			1
11-290-316-00			1
11-290-317-00			1
11-290-318-00			1
11-290-320-00			1
11-290-321-00			1
11-290-336-00	ONEKAMA TOWNSHIP		1
11-290-337-00	ERVIN MICHELLE M & PATRICK J		1
11-290-338-01	DESKINS NANCY M TRUST		1
11-290-338-02	DESKINS NANCY M & ADAMS JOSEPH M		1
11-290-339-00	DESKINS NANCY M &		1
11-290-340-01	KRAMIG THOMAS E & JACQUELINE P		1
11-290-341-00	DIXON DALE & KATHY	2638 LAKEVIEW RD	1
11-290-342-00	DESKINS NANCY M &		1
11-290-343-00	CHAPPELL STEVEN M		1
11-290-344-00	GARRETT MICHAEL A & CAROLYN	9214 LAKESIDE AVE	1
11-290-345-00	HOPKINS JON & PEGGY	9120 LAKESIDE AV	1
11-290-346-00	MIDDLETON FAMILY TRUST	9114 LAKESIDE AV	1
11-290-347-00	FINNEY CURTIS J	9330 LAKESIDE AV	1
11-290-348-00	BURKEL DONALD & ANN M	9314 LAKESIDE AV	1
11-290-350-00	HODGMAN DAVID & LIANE	9296 LAKESIDE AV	1
11-290-351-00	RHOADS PAUL K TRUST	9280 LAKESIDE AV	1
11-290-352-00	SPORER ALISSA L	9274 LAKESIDE AV	1.5
11-290-353-00	HENDERSON BRUCE T & JANET L	9400 LAKESIDE AV	1
11-290-353-01	MATTHEWS SUSAN S TRUST	9380 LAKESIDE AVE	1
11-290-353-03	DUEMLER ALFRED F III & SUE C	9364 LAKESIDE AV	1
11-290-353-06	ZACK EVERETT & ROSENELE (LE) TR	9340 LAKESIDE AV	1
11-290-354-00	DREW JOHN R	9440 LAKESIDE AV	1
11-290-354-20	HALL RONALD R & BETTINA J (LE) & TR	9428 LAKESIDE AV	1
11-290-354-30	MAYHEW KAREN A TRUST	9420 LAKESIDE AV	1
11-290-354-40	MCCLAIN MARK & DEANNA	9414 LAKESIDE AV	1
11-290-354-50	MEEK EDWARD J & KATHERYN R	9408 LAKESIDE AV	1
11-290-368-00	WOODS JASON C & APRIL B	3111 MIDWAY	1
11-290-369-00	DRIPPS ROY C & ANN D	3125 MIDWAY	1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-290-370-00	MCCAUSLAND CAMERON & TAMMI	3145 MIDWAY	1.5
11-290-371-00	LUMPKIN NANCY S TRUST	3159 MIDWAY	1
11-290-372-00	SCHRAM THOMAS L & DEBORAH A	3075 MIDWAY DR	1
11-290-373-00	MAKOWIEC RICHARD & ANGELA		1
11-290-374-00	MAKOWIEC RICHARD & ANGELA	3055 MIDWAY	1.5
11-290-375-00	TAMULIS WALTER & CAROL	3091 MIDWAY	1.5
11-290-376-00	HOLMAN DONALD G TRUST	3171 MIDWAY	1
11-290-377-02	ONEKAMA TOWNSHIP		1
11-290-377-10	EVANS ROBERT M TRUST &		1
11-290-377-13	ONEKAMA TOWNSHIP		1
11-290-377-15	ONEKAMA TOWNSHIP		1
11-300-001-00	ADAMS JOHN F TRUST	8729 BAYVIEW RD	1
11-300-002-00			1
11-300-003-00	APPICELLI KEITH & CAROLE	8703 BAYVIEW RD	1
11-300-004-00	MAKI MARTIN & REBECCA	8687 BAYVIEW RD	1
11-300-005-00	WORKMAN TRUST	8675 BAYVIEW RD	1
11-300-006-00	VANDERHULST WAYNE &KATHLEEN	8679 BAYVIEW RD	1
11-300-007-00	SIEWERTSEN DONALD & DEBORAH	8659 BAYVIEW RD	1
11-300-008-00	MAIN DEBORAH A & MAIN CAROL S	8657 BAYVIEW RD	1
11-300-009-00	MAIN DONALD E TRUST &	8651 BAYVIEW RD	1
11-300-010-00	HEISER JAMES P & SHEILA	8641 BAYVIEW RD	1
11-300-011-00	PALKO DANIEL & JUDITH &	8629 BAYVIEW RD	1
11-300-012-00	ECKERT ROGER & KAREN	8623 BAYVIEW RD	1
11-300-013-00	TABACZKA JANE ETAL	8611 BAYVIEW RD	1
11-300-014-00	HOUSER JERRY & BARBARA	8597 BAYVIEW RD	1
11-300-014-10			1
11-300-015-00	POSTEMA JAMES BRIAN & TONI	8579 BAYVIEW RD	1
11-300-016-00	PETERSON BRADFORD J & ANNA M	8571 BAYVIEW RD	1
11-300-017-00	WORKMAN GARY & HELENE P	8559 BAYVIEW RD	1
11-300-018-00	KASSON DANIEL J	8543 BAYVIEW RD	1
11-300-019-00	KROLCZYK DENNIS ETAL	8529 BAYVIEW RD	1
11-300-020-00	WOODS RONALD & DIANE (LE) ETAL	8495 BAYVIEW RD	1
11-300-021-00	MAJOR DEBORAH J TRUST &	8445 BAYVIEW RD	1
11-300-022-00	TABACZKA JANE ETAL		1
11-300-022-10	HOUSER JERRY & BARB		1
11-300-023-00	GROSZ EDMUND R & ERNA		0
11-300-023-10	WOODS RONALD & DIANE (LE) ETAL		0
11-330-009-00	LITTLE EDEN CAMP	9214 WOODLAND DR	1
11-330-009-01	LITTLE EDEN CAMP		1
11-330-010-00	LITTLE EDEN CAMP		1
11-330-027-00	ARMBRUSTER THOMAS H		1
11-330-029-00	POWELL ROBERT & BETTY TRUST	3364 PORTAGE POINT DR	1
11-330-030-00	ONEKAMA TOWNSHIP		1
11-330-031-00	ONEKAMA TOWNSHIP		1
11-330-032-00	ARMBRUSTER THOMAS H	3468 PORTAGE POINT DR	1
11-330-033-00	ARMBRUSTER THOMAS H		1
11-330-034-00	KIEFFER RAYMOND TRUST	3576 PORTAGE POINT DR	1
11-330-035-00	HENDRICKS ALICE		1
11-330-045-00	HOSTENY JOANNA M TRUST		1
11-330-046-00	WALLEN MARK	3098 PORTAGE POINT DR	1
11-330-047-00	MAJEWSKI STANLEY F ETUX		1
11-330-058-00	MAJEWSKI STANLEY F ETUX		1
11-330-059-00	HUGHES TIMOTHY L		1
11-330-059-05	HENDERSON JONALEA NEIDER		1
11-330-059-10			1
11-330-059-07	NEIDER JONALEA HENDERSON	E PORTAGE POINT DR	1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-330-059-15	RUOFF JOSEPH A & AMY E	2924 E PORTAGE POINT DR	1
11-330-059-17	NEIDER JONALEA		1
11-330-062-00			1
11-330-068-00			1
11-330-069-00			1
11-330-070-00			1
11-330-071-00			1
11-330-072-00			1
11-330-073-00			1
11-330-074-00	HOUCK RICHARD & IMOGENE (LE) TRUSTS		1
11-330-074-03	NATURE CONSERVANCY		1
11-330-074-05	MOODY JAMES D, OSMUS SUSAN	2656 PINE RUN DR	1
11-330-074-06	SOPER DORIS M LIVING TRUST		1
11-330-074-07	ANDERSON THOMAS R & CONNIE L	9391 LAKESIDE AVE	1
11-330-075-00	MASLAR LAURA TRUST		1
11-330-075-10	SIWEK JAY & LINDA		1
11-330-075-30	SIWEK JAY & LINDA	9335 LAKESIDE AV	1
11-330-075-35	CONNOLLY FRANCIS T &	9307 LAKESIDE AV	1
11-330-075-40	CONWAY BRIAN & DEBRA	9285 LAKESIDE AV	1
11-330-076-00	BOOKER DEBORAH S &		1
11-330-076-10			1
11-330-076-15	HATTENDORF WILLIAM H III	9241 LAKESIDE AV	1
11-330-077-00	THOMAS DANIEL & WENDY TRUST	9201 LAKESIDE AV	1
11-330-078-00	HOLTON MICHAEL & JOANNE		1
11-330-079-00	HOLTON MICHAEL TRUST	9117 LAKESIDE AV	1
11-335-004-00	BALMER JOHN P &	3644 PORTAGE POINT DR	1
11-370-001-00	8794 LAKESIDE LLC	8794 LAKESIDE AV	4
11-370-002-00	WOOD SALLY M TRUST	8836 LAKESIDE AV	1
11-370-003-00	SWANSON HELEN D SMYTHE &	8856 LAKESIDE AV	1
11-370-004-00	OSBORNE JOHN & ANN E	8878 LAKESIDE AV	1.5
11-370-005-00	LANG STEPHEN R & ALISON M	8900 LAKESIDE AVE	1
11-370-006-00	HERZOG ALBERT P & HERZOG JOHN &	8912 LAKESIDE AV	1
11-370-007-00	HERZOG JOHN P & SUSAN B	8928 LAKESIDE AV	1
11-370-008-00	BERGLAND EVELYN &	8942 LAKESIDE AV	1.5
11-370-009-00	ABRAHAM WILLIAM J JR ETUX	8980 LAKESIDE AV	1
11-370-010-00	MILASICH RUDOLPH L JR	8982 LAKESIDE AV	1
11-370-011-00	SMITH ANN W TRUST	8998 LAKESIDE AV	1
11-370-012-00	SMITH ANN W TRUST		1
11-370-013-00	MARR DAVID TRUST ETAL	9008 LAKESIDE AV	1
11-370-014-00	RENTAL VACATION HOME TRUST	9016 LAKESIDE AV	1
11-370-015-00	RILEY JAMES & CLAIRE	9034 LAKESIDE AV	1
11-370-016-00	SCHLEIFFARTH ROBERT & ELIZABETH TRU	9060 LAKESIDE AV	1
11-370-017-00	PMPA HOLDINGS LLC	9080 LAKESIDE AV	2
11-370-018-00	HARLEY JOHN W & ELAINE K (LE) &	9094 LAKESIDE AV	1
11-370-022-10	CARPENTER MICHAEL	8981 LAKESIDE AV	1
11-370-023-10	SKIBO TRUST	9007 LAKESIDE AV	1
11-370-024-00	STANEK MICHAEL & BLANCHE &ETAL	2205 LAKEISLE AV	1
11-370-024-10	STANEK MICHAEL & BLANCHE (LE)	LAKEISLE AVE	1
11-370-027-00	LONGCORE ROBERT ET AL	8909 LAKESIDE AV	1.5
11-370-028-00	OSBORNE JOHN & ANN E	8881 LAKESIDE AV	1
11-370-029-00	DESHONE BARBARA	8853 LAKESIDE AV	1
11-370-030-00	8794 LAKESIDE LLC		1
11-370-031-00	8794 LAKESIDE LLC		1
11-370-032-00	8794 LAKESIDE LLC		1
11-370-034-00	RIVERA JEFFREY	RIDGE AVE	1
11-370-035-00	BRADLEY DON & KORENDYKE BEN		1

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Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-370-036-00	8794 LAKESIDE LLC		1
11-370-037-00	ROGERS BARBARA ETAL	8794 GLENDALE DR	1
11-370-038-00	ROGERS BARBARA ETAL		1
11-370-039-00	STEVENSON MARGARET		1
11-370-040-00	STEVENSON MARGARET		1
11-370-042-00	HOSPADARUK ROBERT & BETH ANNE		1
11-370-043-00	STEVENSON MARGARET L		1
11-370-044-00	STEVENSON MARGARET LYNN		1
11-370-045-00	HOPKINS B SMITH TRUST	2279 LAKEISLE AV	1
11-370-046-00	PARKER SCOTT C	2291 LAKEISLE AV	1
11-370-047-00	MONNETT ROBERT K TRUST		1
11-370-047-20	BEALL BADGER & JULIE	2263 LAKEISLE AV	1
11-370-048-00	DECKER MARTHA JO	2261 LAKEISLE AV	1
11-370-049-10	JESSEN JENS L & CHARLOTTE	2304 LAKEISLE AV	1.5
11-370-063-00	BIGLER JOHN S JR & BARB TRUST	8804 NORWOOD AV	1
11-370-064-00	THOLE JACK & NANCY TRUST		1
11-370-066-00	ANDREWS CHARLES E & SUSAN A	8850 NORWOOD AV	1
11-370-066-10	ANDREWS CHARLES E & SUSAN A	8832 NORWOOD AV	1
11-370-066-50	MULLIGAN LARRY G ETAL	8860 NORWOOD AV	1
11-370-066-60	MULLIGAN LARRY G ETAL		1
11-370-067-00	MULLIGAN LARRY G ETAL		1
11-370-067-10	VAUGHAN WM J & BARBARA		1
11-370-068-00	MEADE DAVID R TRUST &	2230 BEECHWARD AV	1
11-370-069-00	VERPLANK WILLIAM & KATE	2220 BEECHWARD AV	1
11-370-070-00	MEADE DAVID R TRUST &		1
11-370-071-00	KEISER R LINCOLN &	2375 LAKEISLE AV	1
11-370-072-00	VAUGHAN WILLIAM J ETUX	2363 LAKEISLE AV	1
11-370-073-00	NICHOLSON J. MICHAEL & JOAN L	8775 NORWOOD AV	1
11-370-074-00	CLEMAR COTTAGE LLC	8805 NORWOOD AV	1
11-370-075-00	VERPLANK RICHARD J		1
11-370-075-05	VERPLANK WILLIAM &		1
11-370-076-00	NICHOLSON J. MICHAEL & JOAN L		1
11-370-077-00	NORDLOH LEE C & LISA S	8808 PORTAGE POINT DR	1
11-370-079-00	FORWOOD BARBARA J TRUST	8816 PORTAGE POINT DR	1
11-370-080-00	WEBB HUGH M TRUST	8842 PORTAGE POINT DR	1
11-370-081-00	MEADE DAVID R TRUST &		1
11-370-083-00	MULLIGAN GEORGE & MARY	8888 S PORTAGE POINT DR	1
11-370-084-00	DREWS JOHN M & ROBYN L	8900 PORTAGE POINT DR	1
11-370-085-00	SHAPE JOHN & LESLIE		1
11-370-086-00	WOODSIDE KENNETH & KAREN	8946 PORTAGE POINT DR	1
11-370-087-00	FARRIS MARY SKINNER &SKINNER WARREN		1
11-370-088-00	FARRIS MARY SKINNER &SKINNER WARREN	8962 PORTAGE POINT DR	1
11-370-092-01			1
11-370-092-02			1
11-370-092-25			1
11-370-095-00	WINDFALLS LANDING LLC		1
11-370-095-10	DEVOE MICHAEL C & JANE C		1
11-370-097-00	MOSCARDELLI DEBORAH M FRANCKE	2414 LAKEISLE AV	1
11-370-098-00	SMITH ROBERT D & SMITH BARRY G		1
11-370-099-00	SHEEDY KELLY	2435 SEYMOUR ST	1
11-370-100-00	BAKER WINIFRED NELL	8865 PORTAGE POINT DR	1
11-370-100-10	OAKES MARY JANE		1
11-370-101-00	DANIEL MATTHER &		1
11-370-102-00	BROWN RUTH L TRUST	8791 PORTAGE POINT DR	1
11-370-103-00	VANECEK PAULA M TRUST	8793 PORTAGE POINT DR	1
11-370-104-00	RAY LINDA ANN & STOKES JAMES ROBERT	8831 PORTAGE POINT DR	3

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Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-370-106-00	BOYER WM TRUST	8817 PORTAGE POINT DR	1
11-370-107-00	ONEKAMA STARDUST LLC		1
11-370-108-00	VAUGHAN BARBARA NORA		1
11-370-108-10	OAKES MARY JANE		1
11-370-109-00	BELL CHRISTIAN & SUSAN	8830 PORTAGE VIEW RD	1
11-370-110-00	BLANCHARD FREDERICK J & DEBORAH ANN	2470 LAKEISLE AV	1
11-370-111-00	VAUGHAN RICHARD	2473 SEYMOUR ST	1
11-370-113-00	WINDFALLS LANDING LLC	2476 SEYMOUR ST	1
11-370-114-00			1
11-370-114-05			1
11-370-114-			1
11-370-114-09			1
11-370-115-00			1
11-370-116-00	WINDFALLS LANDING LLC		1
11-370-117-00	HOTSON MARY L & HOTSON MERNA C &	8854 PORTAGE LAKE AVE	1
11-370-118-00	WARSH DAVID L	8868 PORTAGE LAKE AVE	1
11-370-119-00	WARSH DAVID L		1
11-370-120-00	VAUGHAN RICHARD		1
11-370-121-00	VERPLANK MARTIN & CHRISTINE		1
11-370-122-00	KEEPSAKE LLC	8807 PORTAGE VIEW RD	1.5
11-370-123-00	CAREY MARY & ETAL	8811 PORTAGE VIEW RD	1
11-370-125-00	ONEKAMA STARDUST LLC	8819 PORTAGE VIEW RD	1
11-370-126-00	GREAVES JUDITH J TRUST	8810 PORTAGE LAKE AVE	1
11-370-127-00	HARTRICH NELSON TRUST	8840 PORTAGE LAKE AVE	1
11-370-128-00	DALY RAYMOND A ET AL	2518 LAKEVIEW RD	1
11-370-130-00	PARKER SCOTT C & KATHY		1
11-370-131-00	MIHAEL NANCY H REVOCABLE TRUST		1
11-370-132-00	ELLIS GEORGE JR & DEBRA E		1
11-370-136-00	ERVIN MICHELLE M & PATRICK J		1
11-370-137-00	ONEKAMA TOWNSHIP		1
11-370-138-00	JOHNSON MATTHEW SCOTT		1
11-370-139-00	SPITZIG K ELEANOR & MARG		1
11-370-140-00	SMITH THOMAS & DANIELS ROSEMARY		1
11-370-141-00	BROWN ANNA MAY	2560 LAKEVIEW RD	1
11-370-142-00	DIRKSEN THEODORE J III	2572 LAKEVIEW RD	1
11-370-143-00	DELOOF RONALD TRUST	2588 LAKEVIEW RD	1
11-370-145-00	DOMRES REVOCABLE TRUST		1
11-375-001-00	RUMLER GERALD E II & LEANNE C TRUST	8901 LAKESIDE AV	1
11-375-002-00	FINNEY JAMES C JR ETAL		1
11-376-003-00	CEFARATTI SAMUEL & TRACY TRUST	2294 LAKEISLE AV	1
11-376-005-00	HOFFMAN ERIC R ETAL	2254 LAKEISLE AV	1
11-376-006-00	JESSEN PAUL F		1
11-410-001-00	CAIRNS MICHAEL J TRUST &	8741 PORTAGE POINT DR	1
11-410-002-00	FISH STEPHEN J & JANE S	8701 PORTAGE POINT DR	1
11-410-002-10	MEADOWCROFT SCOTT & GAIL		1
11-410-003-00	OCONNOR GERALD P TRUST		0
11-410-004-00	ADAMS JOHN F TRUST	8671 PORTAGE POINT DR	1
11-410-005-00	DRAKE GAIL & CARRIGANSUSAN &		1
11-410-006-00	SMUCKER JON		1
11-410-007-00	DOMRES ALLAN E & CATHERINE B		1
11-410-008-00	SORENSON EVELYN L TRUST		1
11-410-009-00	NORTHWOODS DEVELOPMENT LLC		1
11-410-010-00	WINDFALLS LANDINGS LLC	8569 S PORTAGE POINT DR	1
11-410-010-00	WINDFALLS LANDINGS LLC	8569 S PORTAGE POINT DR	1
11-410-012-00	DOMRES ALLAN E &	8600 PORTAGE POINT DR	1
11-410-013-00	SORENSON EVELYN L TRUST	8586 PORTAGE POINT DR	1

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Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-410-014-00	NORTHWOODS DEVELOPMENT LLC	8576 S PORTAGE POINT DR	1
11-410-015-00	WINDFALLS LANDINGS LLC	8566 S PORTAGE POINT DR	1
11-410-016-00	PETERSON STEPHEN W & CYNTHIA K	2144 NINTH ST	1
11-410-017-00	HICKMAN PAUL P TRUST &		1
11-410-018-00	HICKMAN PAUL P TRUST &	8698 PORTAGE POINT DR	1
11-410-019-00	FISHIGAN PROPERTIES LLC	8666 S PORTAGE POINT DR	1.5
11-410-019-10	WADE HARRY V III	8650 PORTAGE POINT DR	1
11-410-020-10	SMUCKER JON		1
11-410-021-00	DRAKE GAIL & CARRIGAN SUSAN &	8620 PORTAGE POINT DR	1
11-410-024-00	CAIRNS MICHAEL J & ELIZABETH C.V.		1
11-410-027-00			1
11-410-029-00	HERZOG ALBERT P III & JUDITH A	8478 LAKESIDE AV	1
11-410-031-10	MONAHAN W DANIEL & SANDRA R		0
11-410-034-00	OCONNOR SALLY JO TRUST	2119 NINTH ST	1
11-410-035-00	WHELAN JOHN T JR & ANN S	2127 NINTH ST	1
11-410-036-00	OLSON SHARON S TRUST	2143 NINTH ST	1
11-410-037-00	WINDFALLS LANDINGS LLC	8520 S PORTAGE POINT DR	1
11-410-038-00	WINDFALLS LANDINGS LLC	8513 S PORTAGE POINT DR	1
11-410-038-50	WATTERS THADDIUS D TRUST		1
11-410-039-00	GERHARDT KATHRYN HARRIS TRUST	8451 LAKESIDE AV	1
11-410-041-00	WINDFALLS LANDINGS LLC		1
11-410-042-00	MALONE WILLIAM D & MARILYN C	8460 LAKESIDE AV	1
11-410-043-00	CONLAN FAMILY HOLDINGS LLC	8438 LAKESIDE AV	1
11-410-044-00	ALLINSON VIRGINIA J TRUST	8412 LAKESIDE AV	1
11-410-045-00	DOOLEY CAROL A TRUST	8382 LAKESIDE AV	1
11-410-047-00	HANKS DAVID ETAL		1
11-410-049-00	STARICK H WILLIAM & MARTHA E		1
11-410-049-10	STARICK H WILLIAM & MARTHA E	2102 PARK PL	1
11-410-050-00	HANKS DAVID ETAL		1
11-410-051-00	PETER PAN AT PORTAGE LAKE LLC		1
11-410-052-00	FRY STEPHEN & SUSAN (LE) &	2104 SIXTH ST	1
11-410-054-00	WINDFALLS LANDINGS LLC		1
11-410-055-00	COOK J ANDREW & BARBARA		1
11-410-056-00	BRADFORD CATHERINE O		1
11-410-057-00	SWANSON NANCY K TRUST		1
11-410-058-00	WIPPERMAN FAMILY LLC		1
11-410-059-00	BLUEWATERS LLC		1
11-410-060-00	SWANSON NANCY K TRUST		1
11-410-061-00	WATTERS THADDIUS D TRUST		1
11-410-062-00	WIPPERMAN FAMILY LLC	8324 PORTAGE POINT DR	1
11-410-063-00	BLUEWATERS LLC	8276 PORTAGE POINT DR	1
11-410-064-00	WIPPERMAN FAMILY LLC		1
11-410-065-00	RUOFF WILLIAM & ROASLIE ETAL	2088 FIFTH ST	1
11-410-066-00	MCDEVITT MARY W TRUST		1
11-410-078-00	BOERSMA MILFORD TRUST		1
11-410-079-00	LANDIS MARTHA TRUST & CASA JULIE		1
11-410-084-00	BOERSMA MILFORD TRUST		1
11-410-085-00	LANDIS MARTHA TRUST & CASA JULIE		1
11-410-086-00	KRAMIG JANICE J TRUST	2091 FIFTH ST	2
11-410-087-00	KRAMIG JANICE J TRUST		1
11-410-088-00	WAGON WHEEL COTTAGE LLC		1
11-410-089-00	CHAGARES SUSAN		1
11-410-091-00	KRAMIG ROBERT E IV	8248 PORTAGE POINT DR	1
11-410-092-00	GROENKE DAVID A TRUSTEE	8224 PORTAGE POINT DR	1
11-410-093-00	WAGON WHEEL COTTAGE LLC	8212 PORTAGE POINT DR	1
11-410-094-00	KRAMIG JANICE J TRUST		1

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Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-410-094-10	KRAMIG ROBERT E IV		1
11-410-095-00	GROENKE DAVID A TRUSTEE		1
11-410-096-00	WAGON WHEEL COTTAGE LLC		1
11-410-097-00	FISHER JOHN H & JOYCE A (LE)& TRUST		2
11-410-098-00	HURLEY JANE A &	8157 PORTAGE POINT DR	1
11-410-099-00	BOERSMA MILFORD TRUST	8141 PORTAGE POINT DR	1
11-410-100-00			1
11-410-101-00	FISHER JOHN H & JOYCE A (LE)& TRUST	8194 PORTAGE POINT DR	1
11-410-102-00	HURLEY JANE A &		1
11-410-103-00	BOERSMA MILFORD TRUST		1
11-410-104-00	LANDIS MARTHA TRUST & CASA JULIE		1
11-410-104-50	THOMSON MARTHA K TRUST	2013 FOURTH ST	2
11-410-105-00	DEEDRICK CAROL B TRUST	2007 FOURTH ST	1
11-410-106-00	BOERSMA MILFORD TRUST		1
11-410-107-00	LANDIS MARTHA TRUST & CASA JULIE		1
11-410-107-10	FERREE ROBERT A & SALLY TRUST	2065 THIRD ST	1
11-410-110-00	LANDIS MARTHA TRUST & CASA JULIE		1
11-410-112-00	LANDIS MARTHA TRUST & CASA JULIE	8112 S PORTAGE POINT DR	1
11-410-113-00	HESKETT JOHN W TRUST	8086 S PORTAGE POINT DR	1
11-410-114-00	HESKETT JOHN W TRUST	8084 S PORTAGE POINT DR	1
11-410-115-00	PORTAGE LAKE YACHT CLUB		1
11-410-116-00	REICHLE KENNETH M JR	8111 PORTAGE POINT DR	1
11-410-117-00	HESKETT JOHN W TRUST		1
11-410-118-00	HESKETT JOHN W TRUST		1
11-410-119-00	PORTAGE LAKE YACHT CLUB	8061 S PORTAGE POINT DR	1
11-410-120-00	WHITACRE NANCY		1
11-410-120-05	WHITACRE NANCY		1
11-410-121-00	DIGGENS FAMILY TRUST	2039 SECOND ST	3
11-410-122-00	NEEB SUE A	2035 SECOND ST	1
11-410-123-00	WALSH JOSEPH W	2031 SECOND ST	1
11-410-124-00	WINDFALLS LANDING LLC		1
11-410-125-00	BRADFORD CATHERINE O	8368 PORTAGE POINT DR	1
11-410-126-00	MARTY PROPERTIES LLC	2114 SIXTH ST	1
11-411-000-00	WINDFALLS LANDING LLC		1
11-411-001-00	FRANK ANNE M		1
11-411-002-00			1
11-411-003-00			1
11-411-004-00			1
11-411-005-00			1
11-411-006-00			1
11-411-007-00	WHITE COTTAGE LLC	2165 NINTH ST	1
11-411-008-00	RUEPING FRANK & JANIS	2149 NINTH ST	1
11-411-009-00	SALLOT ANNE & WINSLOW JAMES	2162 NINTH ST	1
11-411-010-00	WINDFALLS LANDING LLC	2170 NINTH ST	1
11-411-011-00	WINDFALLS LANDING LLC		1
11-411-012-00			1
11-411-013-00			1
11-411-014-00			1
11-411-015-00			1
11-411-016-00			1
11-411-017-00			1
11-411-018-00			1
11-411-019-00			1
11-411-020-00			1
11-411-021-00			1
11-411-022-00			1

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Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-411-023-00			1
11-411-026-00			1
11-411-027-00			1
11-411-028-00			1
11-411-029-00			1
11-411-030-00			1
11-411-023-00	KOVACK PAUL & KELLI (LE) TRUST		1
11-411-024-00	MARTY PROPERTIES LLC	8569 S PORTAGE POINT DR UNIT 24	1
11-411-031-00	CONLEY CONSTANCE & DUDLEY		1
11-411-032-00	KROMBEEN WILLIAM E & PHYLLIS M		1
11-411-033-00	RENEL DANIEL A & PAMELA K		1
11-411-034-00	SCHRTENBOER LISA & RICHARD		1
11-411-035-00	YOUNG LAWRENCE III		1
11-411-036-00	BEECHNUT WALK-UP LLC		1
11-411-037-00	WINDFALLS LANDING LLC		1
11-411-038-00	WINDFALLS LANDING LLC		1
11-411-039-00	WINDFALLS LANDING LLC		1
11-411-040-00	HOOSIER TRADEWINDS PROPERTIES LLC		1
11-411-041-00	GRANT JAYNE E & JAMES J		1
11-411-042-00	LAKESIDE HOLDING LLC		1
11-411-043-00	LAKESIDE HOLDING LLC		1
11-411-044-00	WINDFALLS LANDING LLC		1
11-411-045-00	NELSON TOM & JEAN MARIE	8535 S PORTAGE POINT DR UNIT 45	1
11-411-046-00	JOHNSON ROBERT P		1
11-411-047-00	WENSTRUP JAY P & MARY B	8535 S PORTAGE POINT DR UNIT 47	1
11-411-048-00	LAKESIDE HOLDINGS LLC	8535 S PORTAGE POINT DR UNIT 48	1
11-411-049-00	LAKESIDE HOLDING LLC		1
11-415-001-00	PETER PAN AT PORTAGE LAKE LLC	2074 SIXTH ST	1
11-415-002-00	SWANSON NANCY K TRUST	2073 SIXTH ST	1
11-415-003-00	MCDEVITT TODD & MCDEVITT SUSANNE	2010 FIFTH ST	1
11-415-004-00	MCDEVITT MARY W TRUST	2006 FIFTH ST	1
11-415-005-00	SHEETS JOHN TRUST	2003 FIFTH ST	1
11-415-008-00	CHAGARES SUSAN	2016 FOURTH ST	1
11-415-009-00	MCDEVITT MARY W TRUST		1
11-415-010-00	MARTY PROPERTIES LLC		1
11-415-011-00	MCDEVITT TODD & MCDEVITT SUSAN		1
11-417-002-00	SPRADLING ALBERT TR& SHEETS JOHN TR		1
11-417-006-00	LEWIS GEORGE & WILLIAM		1
11-417-015-00	LEWIS GEORGE G & LEWIS WILLIAM B		1
11-417-016-00	LEWIS GEORGE & WILLIAM		1
11-420-001-00	RUPRICH GARY & SYLVIA	2036 SECOND ST	1
11-420-002-00	WHITACRE NANCY & ANDREW	2040 SECOND ST	1
11-420-003-00	FORD MARY D TRUST	2075 THIRD ST	1
11-425-005-00	MONAHAN W DANIEL & SANDRA R	8520 LAKESIDE AV	1
11-425-019-00	HERZOG ALBERT P III & JUDITH A		1
11-425-020-00	WIPER FAMILY TRUST	2109 NINTH ST	1
11-490-001-00	CAREY JOHN A & SHERI L	4556 CRESCENT BEACH RD	1
11-490-002-00	GREEN DENNIS W		1
11-490-003-00	JOUSMA FLOYD L JR& SANDRA(LE)&TRUST	4612 EASY ST	1
11-490-004-00	DROOGER DAVID G & LINDA	4634 EASY ST	1
11-490-005-00	DEKKER LEROY D (LE) TRUST	4654 EASY ST	1
11-490-006-00	CLOUSE JEFFREY & AMBER	4668 EASY ST	1
11-490-007-00	DUNCAN FAMILY TRUST	4688 EASY ST	1
11-490-008-00	LANNING ALVIN JAY TRUST	4708 EASY ST	1
11-490-009-00	MEDVECKY JULIE & JEFF &	4718 EASY ST	1
11-490-010-00	PEPLINSKI GEORGE & TOKEAH	4742 EASY ST	1

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11-490-011-00	HAMADY DAVID J &	4733 EASY ST	1
11-490-013-00	WALCOTT KURT & SHANNON	4695 EASY ST	1
11-490-014-00	NOLAN JOHN	4665 EASY ST	1
11-490-015-00	KNUDSEN SEAN	4633 EASY ST	1
11-490-016-00	WEST DORIS MARIE	4658 CRESCENT BEACH RD	1
11-490-018-00	JACKSON OKLA & MERLYN TRUST	4718 CRESCENT BEACH RD	1
11-490-020-00	DOMINY EVERARD L TRUST	4738 CRESCENT BEACH RD	1
11-530-001-00	RUTHVEN JOHN (LE)	3995 LAKESHORE DR	1
11-530-002-00	STICKEL LORRAINE D	7647 REEVES ST	1
11-530-003-00	OLSON GERALD C ETAL	7587 REEVES ST	1
11-530-006-00	BLARNEY CASTLE INC	3953 LAKESHORE DR	1.5
11-530-007-00	RUTHVEN JOHN (LE)	7658 REEVES ST	1
11-530-007-10	SAPKOWSKI JOHN & SHIRLEY TRUST		1
11-530-007-15	SAPKOWSKI JOHN & SHIRLEY TRUST	7634 REEVES ST	1
11-530-007-18	SAPKOWSKI JOHN & SHIRLEY TRUST		1
11-530-008-00	MILLER ALBERT R TRUST	3921 LAKESHORE DR	2
11-530-009-00	KAMALOSKI MICHAEL & NAN	3903 LAKESHORE DR	1
11-530-010-00	BRADFORD HARRIETT C &	3879 LAKESHORE DR	2
11-530-012-00	BENEKE EDWARD U JR & ETAL		1
11-530-013-00	BENEKE EDWARD U JR & ETAL		1
11-530-014-00	BENEKE EDWARD U JR & ETAL	3827 LAKESHORE DR	1
11-530-015-00	HICKS FAMILY TRUST	7617 BENEKE ST	1
11-530-016-00	LENON HERBERT TRUST &	3801 LAKESHORE DR	1
11-530-017-00	GRAHAM GREGORY & ROBIN &	7631 BENEKE ST	1
11-530-017-10	PUNCHES MARGARET A TRUST	3813 LAKESHORE DR	1
11-530-018-01	REEDY KATHERINE R TRUST	3757 LAKESHORE DR	1
11-530-019-00	BENEKE EDWARD U JR & ETAL		1
11-530-020-00	ZIEHM TAMI JO	3824 KENDALL ST	1
11-530-021-00	MATHIEU CURTIS JON	3806 KENDALL ST	1
11-530-022-00	JANKOWSKI DENNIS	7539 BENEKE ST	1
11-530-023-00	COURNEYA ROBERT T	7575 BENEKE ST	1
11-530-024-00	HICKS FAMILY TRUST		1
11-530-026-00	HUNT TOM & PHYLLIS	7573 LEONARD AV	1
11-530-027-00	STEPANOVIC MICHAEL& GERRILYN		1
11-530-027-10	LLOYD RICHARD & BOBBIE	3780 KENDALL ST	1
11-530-030-00	LLOYD RICHARD & BOBBIE	7405 LEONARD AV	1
11-530-031-00	MIRABITUR RICHARD & SANDRA (LE) &	7517 LEONARD AV	1
11-530-033-00	HOLLINGSWORTH FAMILY CORP	3735 LAKESHORE DR	1
11-530-034-00	FAIRCHILD ROBERT D & HELEN H TRUST	7576 LEONARD AV	1
11-530-035-00	CECCONI JOHN & PATRICIA		1
11-530-036-00	MILLARD FAMILY TRUST	7488 LEONARD AV	1
11-530-036-10	VALLEE MARK A	7461 MCMILLAN ST	1
11-530-037-00	FROST HERBERT H & PAULA A	7452 LEONARD AV	1
11-530-038-00	FROST HERBERT H & PAULA A		1
11-530-038-10	MANISTEE COUNTY ROAD COMMISSION		1
11-530-040-00	RADTKE DANNY L TRUST		1
11-530-040-10	WARNER ANDREW T &		1
11-530-041-00	LAMKIN WALTER R TRUST	3719 LAKESHORE DR	1
11-530-043-00	BEHRING NANCY J TRUST	3695 LAKESHORE DR	1
11-530-044-00	ZEILE RICHARD & BARBARA	7447 TORRANT ST	1
11-530-045-00	MANISTEE COUNTY ROAD COMMISSION		1
11-530-046-00	BAUSCH GREG & SHELLEY TRUST		1
11-530-046-10	MINCY CRAIG & BULLION CAROLE	3633 KARI ST	1
11-530-047-00	RAY JEROME A & KAREN M TRUST	7465 TORRANT ST	1
11-530-048-00	LAWRENCE ROBERT TERRELL	7481 TORRANT ST	1
11-530-049-00	WALTERS GARY A & JANICE M (LE)&TRUS	3669 LAKESHORE DR	1

Onekama Twp - Parcels in Proposed Sewer District

Parcel Number	Owner Name Per County GIS Records	Parcel Street Address	REU
11-530-050-00	RADTKE DANNY L TRUST	3635 LAKESHORE DR	1
11-530-051-00	HUDAK MICHAEL T & MICHELLE A	7472 TORRANT ST	1
11-530-051-05	MANISTEE COUNTY ROAD COMMISSION		1
11-530-051-10	RADTKE DANNY L TRUST		1
11-530-051-15	FORTH PEARL B & FORTH CHRISTOPHER		1
11-530-052-00	TYSON ELIZABETH A &		1
11-530-053-00	TYSON ELIZABETH A &	7441 DANFORTH ST	1
11-530-054-00	UNDERWOOD MARGARET TRUST	7445 DANFORTH ST	1
11-530-055-00	GANNON EULA TRUST	3627 LAKESHORE DR	2
11-530-056-00	MCCORMICK JAMES & JOY	3599 LAKESHORE DR	1
11-530-057-00	MCCORMICK JOY		1
11-530-057-05	FORTH PEARL B & FORTH CHRISTOPHER		1
11-530-058-00	FORTH PEARL B & FORTH CHRISTOPHER	7434 DANFORTH ST	1
11-530-058-20	RATHFORD STEPHEN M & SUSAN L	7407 WINNOGENE ST	1
11-530-058-25	RETTELL STEPHEN R	7433 WINNOGENE ST	1
11-530-058-30	KOOPMAN JOHN C & ELAINE	3579 LAKESHORE DR	1
11-530-059-00	ALAMEDDINE SUSAN TRUST	3553 LAKESHORE DR	1
11-530-059-10	VACEK JOHN JR & ARLENE	7438 WINNOGENE ST	1
11-530-060-00	VACEK JOHN JR & ARLENE		1
11-530-060-01	TORRES MIGUEL & KELLY GRAY	7422 WINNOGENE ST	1
11-540-001-00	BROMLEY WILLIAM H & NANCY J	3512 CRESCENT BEACH RD	1
11-650-008-00	HURST VICTORIA C TRUST		1
11-650-009-00	CARTER FAMILY LLC		1
11-650-009-10			1
11-655-001-00	HURST VICTORIA C TRUST	2092 CRESCENT BEACH RD	1.5
11-655-016-00	ARENS THEODORE G & PAMELA J TRUSTS	2110 CRESCENT BEACH RD	2
11-655-017-00	WHEYLAND CHARLOTTE TRUST		1
11-655-018-00	HARDENBERGH JORDAN T &		1
11-660-007-00	CARTER WILLIAM W & SUE ELLEN TR &		1
11-660-013-00	ROSEGATE LLC	2046 CRESCENT BEACH RD	4
11-690-005-00			1
11-690-016-00			2

Total Assessments	REUs
928	954.5

Bear Lake Township Final Sewer District

Parcel No.	Units		
02-004-125-02	4.5	Saddle Up	5000 sft, 7 pumps
02-004-125-04	1		
02-004-125-05	1		
02-004-125-06	1		
02-004-125-07	1		
02-004-125-08	15	Grille 44	3000 sft at 5 reus/1000
02-004-200-01	1		
02-004-200-04	0.5		
02-004-200-05	1		
02-004-200-06	1		
02-004-200-07	0.5		
02-004-200-08	2		
02-004-200-09	1		
02-004-200-12	1		
02-004-200-13	1		
02-004-200-14	1		
02-004-200-15	1		
02-004-200-17	2		
02-004-200-18	1		
02-004-200-19	2		
02-004-200-20	1		
02-004-200-2 3	1		
02-004-200-24	1		
02-004-250-00	1		
02-004-250-0 1	1		
02-004-275-09	5	bear lake medical	5600 sft @0.9 reus/1000
02-004-275-13	0		
02-004-275-14	0		
02-005-300-0 1	1		
02-005-300-02	1		
02-005-300-03	0.5		
02-005-300-0 5	7.5	Blarney Castle Corporate Office	15000 sft @ 0.5reus/1000

02-005-300-06	1	
02-005-300-07	1	
02-005-300-08	1	
02-005-300-09	1	
02-005-300-10	1	
02-005-300-11	0.5	
02-005-300- 12	1	
02-005-300-13	0.5	
02-005-300-14	1	No frontage on sewer, 02-005-300-15 does
02-005-300-16	1	
02-005-300-18	1	
02-005-300-20	0.5	
02-005-325-01	1	
02-005-325-02	1	
02-005-325-03	1	
02-005-325-04	1	
02-005-325-05	1	
02-005-325-06	1	
02-005-325-07	1	
02-005-325-08	1	
02-005-325-09	1	
02-005-325-10	1	
02-005-325-15	1.5	
02-005-325-20	1	
02-005-350-07	1	
02-221-001-00	1	
02-221-002-00	1	
02-221-003-00	1	
02-221-004-00	1	
02-221-005-00	1	
02-221-006-00	1	
02-221-007-00	1	
02-221-008-00	1	
02-341-701-01	1	

02-341-701-05	1
02-341-701-09	1
02-341-702-02	0.5
02-341-702-05	1
02-341-702-07	1
02-341-702-08	1
02-341-702-09	1
02-341-703-05	1.5
02-341-703-09	1
02-341-704-01	1.5
02-341-704-03	1
02-341-704-07	1
02-341-704-10	1
02-341-705-03	1
02-341-705-07	1
02-341-705-09	1
02-341-706-01	1
02-341-706-03	1
02-341-706-05	1
02-341-706-07	1
02-341-707-01	1
02-341-707-03	1
02-341-707-05	1
02-341-707-09	1.5
02-341-708-01	1
02-341-708-03	1
02-341-708-05	1
02-341-708-07	1
02-341-709-01	1
02-341-709-04	1
02-341-709-07	1
02-341-709-09	1.5
02-341-710-01	1
02-341-710-03	1

02-341-710-05	1
02-341-710-07	1
02-341-710-09	1
02-341-711-0 l	1
02-341-711-05	1
02-341-711-07	1
02-581-701-01	1
02-581-701-04	1
02-581-701-05	1
02-581-701-11	1
02-581-701-14	1
02-581-701-20	1
02-581-702-02	1
02-581-702-07	1
02-581-702-13	1
02-581-702-16	1
02-581-703-03	1
02-581-703-04	1
02-581-703-05	1
02-581-704-03	1
02-635-001-00	1
02-635-002-00	1
02-635-003-00	1
02-635-004-00	1
02-635-005-00	1
02-635-006-00	1
02-635-007-00	1
02-635-008-00	1
02-641-717-01	1.5
02-641-717-02	1
02-641-717-05	1
02-641-717-09	1
02-64 1-717-10	1
02-641-717-14	1

02-641-717-16	1
02-641-718-01	1
02-641-718-03	1
02-641-718-05	1
02-641-718-09	1
02-641-718-13	1
02-641-738-11	1
02-641-738-13	1
02-641-739-01	1
02-641-740-01	1
02-641-740-04	1
02-641-740-05	1
02-641-740-06	1
02-641-740-08	1
02-641-740-09	1
02-641-740-10	1
02-641-740-11	1
02-641-741-01	2
02-641-741-07	1
02-641-773-01	0.5
02-641-773-03	1
02-641-773-05	1
02-641-773-07	1
02-641-773-09	1
02-641-773-11	1
02-641-773-13	1
02-641-773-15	1
02-641-773-16	1
02-641-773-17	1
02-641-773-19	1
164 parcels	193 REUs

	A	B	C	D	E	F	G	H
1	Village of Bear Lake -Final Sewer District Map							
3								
4	PARCEL NUMBER	OWNER	ADDRESS	Special Asses	Benefit units	REASON		
5	32-005-400-02	David Adams		1	1			
6	32-005-400-00	Sally King and David Reed	12300 Russell Street	1	1			
7	32-562-713-05	Wanda Schafer, Susie Locker	12424 Russell Street	1	1			
8	32-562-709-11	Richard & Myrna Walter	12424 Russell Street	1	1			
9	32-562-708-11	Marseillie McNett	12460 Russell Street	1	1			
10	32-562-708-01	Independent Telephone Corp	12488 Russell Street	1	1			
11	32-562-707-17	Arlee Sutton	12554 Russell Street	1	1			
12	32-562-703-01	Mardelle Johnson	7963 Lake Street	1	1			
13	32-562-707-01	Mardelle Johnson		0	0	non build - water side US 31		
14	32-562-707-07	Hugh Higley	7961 Lake Street	1	1			
15	32-562-703-05	Hugh Higley		0	0	non build- water side US 31		
16	32-562-704-01	Charles Kevin Hunt	7941 Lake Street	1	1			
17	32-562-703-09			0	0	non build - water side US 31		
18	32-562-707-13		7949 Lake Street	1	1			
19	32-562-704-03	Allan Colleen Swanson	7933 Lake Street	1	1			
20	32-241-701-01	John Debra Bradley	7899 Lake Street	1	1			
21	32-562-704-05			0	0	non build - water side US 31		
22	32-005-175-03	Kenneth & Jean Sibley	7885 Lake Street	1	1			
23	32-005-175-04			1	1			
24	32-005-175-01	Scott Burnham	17833 Lake Street	1	1			
25	32-005-175-02			1	9	Café - 1800 sft @5REU/1000		
26	32-561-703-03			1	1			
27	32-342-701-01	Joyce Gorley	7809 Lake Street	1	1			
28	32-342-704-09			0	0	non build - water side US 31		
29	32-562-701-01	State of MI Dept Highway		0	0	non build - water side US 31		
30	32-562-703-10			0	0	non build - water side US 31		
31	32-342-701-09	Connie Wallstrom	7799 Lake Street	1	1			
32	32-342-701-13		7789 Lake Street	1	1			
33	32-342-701-05	Bear Lake Township Hall	7771 Lake Street	0	0	Government		
34	32-342-703-01			0	0	Government		
35	32-222-701-01	CJ McGee LLC	7749 Lake Street	1	1			
36	32-222-701-05	Bear Lake Mason	7737 Lake Street	1	1			
37	32-221-705-03	Stacy & Leah Peterson	7717 Lake Street	1	1			
38	?	Manistee Land Bank - variety	12407 Lynn Street	1	1	Government		
39	?	Manistee Land Bank - white house	12395 Lynn Street	1	1	Government		
40	32-221-706-01	Jon Haugen or Filer Cr Union	7685 Lake Street	1	1			
41	32-221-701-01	Toni Schroder	7820 Lake Street	1	1			
42	32-221-701-02	Bear Lake Cottages Williams	7816 Lake Street	1	3	3 units (assumed)		
43	32-221-701-03	Schroder, Nusmeyer	7802 Lake Street	1	1			
44	32-221-701-04	Schroder, Nusmeyer - marinia	7798 Hopkins Dr	1	1			
45	32-221-701-09	BL Village/BL Township	7727 Lake Street	0	0	non build - road way		
46	32-541-701-01	BL Village		0	0	non build -		
47	32-541-701-02	BL Village	7781 or 7718 Lake Street	1	1			
48	32-221-705-01	BL Village - pocket park	7725 Lake Street	0	0			
49	32-541-701-05	Clyde W. & James R Reed		1	1			
50	32-541-701-06	Lions Club	7748 Lake Street	1	1			
51	32-541-701-08	Hugh & Paula Yorton	7762 Lake Street	1	1			
52	32-541-701-03	James & Shelly Reed	7730 or 7726 Lake Street	1	1			
53	32-541-702-01	Village	7730 Lake Street	1	1			
54	32-541-702-05	BL Village	7718 Lake Street	1	1			
55	32-541-703-01	James M Kieszkowski Trust	7710 Lake Street	1	1			
56	32-541-703-05	Hillary Potter Erickson	7702 Lake Street	1	1			
57	32-541-703-07	Brenden & Krista Fink	7686 Lake Street	1	1			
58	32-541-704-03	Glenn Moore Trust	7676 Lake Street	1	1			
59	32-541-705-03	James & Shelly Reed	7660 Lake Street	1	1	4000 sft retail @0.5 REU/1000		
60	32-005-425-01		?	0	0	non build ?		
61	32-221-702-01	Blarney Castle Inc	7681 Lake Street	1	1			
62	32-221-702-09	Bear Lake Village	7576 Lake Street	0	0	non build - park		
63	32-221-703-02	Blarney Castle Inc	?	0	0	non build		
64	32-221-703-03	Robert & Marjorie Rosenzweig	7526 South Shore	1	1			
65	32-221-703-08	Marilyn McCarthy	7494 South Shore	0	0	non build		
66	32-221-707-01	Blarney Castle Oil Co. Inc	12348 West Street	1	5	3200 sft @ 0.2reu/1000 + 8 pumps@0.5 reu/pump		
67	32-221-708*17	Robert Barbara DeWildt	12273 West Street	1	10	20 room@0.5reu/room		
68	32-221-732-10	Christopher & Dawn Sutton	12252 Maple Street	1	1			
69	32-221-732-06	Venus Bradford	12234 Maple Street	1	1			
70	32-221-732-05	VanLiere, James R Trust	12220 Maple Street	1	1			

	A	B	C	D	E	F	G	H
71	32-231-732-03	Barbara K Bauer-Smith	12202 Maple Street	1	1			
72	32-231-731-08	Olah, Renee	12182 Maple Street	1	1			
73	32-231-725-08	Athony Evans Rugg Marla Mae	12915 Maple Street	1	1			
74	32-221-725-06		12217 Maple Street	0	0	non build		
75	32-221-725-05	Yvonne Baughan	12229 Maple Street	1	1			
76	32-221-725-01	Patricia Higgins	12241 Maple Street	1	1			
77	32-221-711-05	Kent Babcock	12291 Maple Street	1	1			
78	32-221-710-05	Blarney Castle Oil Co,	12332 Lake Street	1	1			
79	32-221-710-01	Gloria Edwards, ? Bennett	7623 Main Street	1	1			
80	32-221-713-02	Barry Boughner	7647 Main Street	1	1			
81	32-221-713-01	Cole Setser	7651 Main Street	1	1			
82	32-221-705-09	Karen Leckrone	12391 Lynn Street	1	1			
83	32-221-714-16	Jerry Caroll Bair	12372 Lynn Street	1	1			
84	32-221-715-03	Oak Grove Cremanation Center Inc	12353 Lynn Street	1	1			
85	32-221-716-14	same as above		1	1			
86	32-221-716-13	Nancy Charlich-Smith	7745 Main Street	1	1			
87	32-222-702-01	Village of Bear Lake (Office/Museum)	12376 Virginia Street	1	1			
88	32-221-716-12	Andrea Ware	12352 Virginia Street	1	1			
89	32-221-716-10	Todd & Nancy Netherton	12334 Virginia Strett	1	1			
90	32-221-716-09	Jim Thompson	12328 Virginia Street	1	1			
91	32-221-716-07	Megan Meyer	12318 Virginia Street	1	1			
92	32-221-716-03	Rebecca & Kenneth Cook	12294 Virginia Street	1	1			
93	32-221-716-06	Rebecca & Kenneth Cook	empty lot no addy	1	1			
94	32-221-716-01	Glenda & Merlin Norby	12274 Virginia Street	1	1			
95	32-341-701-01	Glenda & Merlin Norby	empty lot no addy	1	1			
96	32-341-702-01	Lori & Curtiss Schaeffer	12273 Virginia Street	1	1			
97	32-221-717-11	Lori & Curtiss Schaeffer	empty lot no addy	1	1			
98	32-221-717-10	Keddie-Norconk Library	12325 Virginia	1	1			
99	32-221-717-07	Keddie-Norconk Library	empty lot no addy	1	1			
100	32-221-717-02	Nelson LLC	7777 Main Street	1	1			
101	32-221-717-01	Woodfield Acres LLC	no address - empty lot	1	1			
102	32-221-704-01	Jerald Johnson	7776 Main Street	1	1			
103	32-221-704-05	Greg & Cindi McPherson	7812 Main Street	1	1			
104	32-221-718-13	Woodfield Acres LLC (Apts)	12346 Smith Street	1	1			
105	32-221-718-13	Pienta Joseph A Trust	12334 Smith Street	1	1			
106	32-221-718-07	BL United Methoist Chruch	12346 Smith Street	1	1			
107	32-221-702-06	Edwards Kenneth Hugen & Diana Trust	empty lot no addy	1	1			
108	32-341-702-05	Edwards Kenneth Hugen & Diana Trust	empty lot no addy	1	1			
109	32-341-703-01	Bear Lake Public School	7748 Cody St & 7795 Stuart St	1	19	Assumed		
110	32-343-701-01	Bonnie & Delbert Miner	12143 Smith Street	1	1			
111	32-343-701-09	Robert June Iverson	12201 Smith Street	1	1			
112	32-343-701-15	Susan Meyer	12227 Smith Street	1	1			
113	32-343-702-03	Lyndia Virginia McClintock	12243 Smith Street	1	1			
114	32-221-702-09	Patricia Gilbert	12267 Smith Street	1	1			
115	32-221-702-11	Stephen Swanson	12291 Smith Street	1	1			
116	32-221-702-15	Ovon Smith	12311 Smith Street	1	1			
117	32-005-400-01	BL United Methoist Chruch	7861 Main Street	1	4	8000 sft @.25/1000		
118	32-561-701-01	Suzanna Kae Fischer	7980 Main Street	1	1			
119	32-562-709-17	Jacquie Johnson	7980 Main Street	1	1			
120	32-562-713-00	Natalie Ware	7991 Main Street	1	1			
121								
122			Total	99	143			

Pleasanton Final Sewer District

PARCEL NUMBER	OWNER	ADDRESS	special ass'ment units	benefit units	REASON
12-423-702-70	ABBOTT FAMILY TRUST	14127 HOUSER AVE	1	1	
12-421-714-09	ABEL, STEVEN R	13845 LAKESIDE AVE	1	1	
12-401-701-01	ADAMS DAVID & WILAMENIA	HOPKINS FOREST DR	0	0	BACK LOT
12-481-701-01	ADAMS DAVID & WILAMENIA	HOPKINS FOREST DR	0	0	BACK LOT
12-031-325-00	ADAMS DAVID & WILMENIA	HOPKINS FOREST DR	0	0	ENCROACH
12-031-325-03	ADAMS DAVID + WILAMENIA	13353 HOPKINS FOREST	1	1	
12-221-701-01	ALLYN, DAVID F	6995 THREE PINES RD	1	1	
12-563-701-09	ANDERSON, ZOLA (DC)	LAKESIDE AVE	1	1	
12-461-707-05	AXCE CHALES W & ALICE KRUSE T	7145 BAIR AVE	1	1	
12-461-727-09	AXCE CHARLES & ALICE K TRUST	BAIR AVE	0	0	ACC BLDG
12-461-720-01	AXCE DON & DEBRA	BAIR AVE	1	1	
12-461-720-05	AXCE DONALD & DEBRA	BAIR AVE	1	1	
12-461-734-05	AXCE DONALD & DEBRA	BAIR AVE	0	0	BACK LOT
12-461-703-01	AYERS, NANCY SPARKS (TRUST)	7061 BAIR AVE	1	1	
12-461-725-01	AYERS, NANCY SPARKS (TRUST)	BAIR AVE	0	0	ACC BLDG
12-031-350-08	BARTON, ROBERT A & PEGGY (TRUST)		0	0	UNBUILDABLE
12-031-350-09	BARTON, ROBERT A & PEGGY A (T	13159 HOPKINS FOREST	1	1	
12-423-705-30	BASHFORD, FREDRICK C (TRUST 5(	14119 HOWELL AVE	1	1	
12-033-200-21	BASKIN, MARY/LOVE, AMY		0	0	BACK LOT
12-421-709-05	BASKIN, MARY/LOVE, AMY	13723 LAKESIDE AVE	1	1	
12-221-710-01	BAUGH THOMAS M	6565 THREE PINES RD	1	1	
12-031-200-04	BAUMAN FAMILY TRUST	6440 THREE PINES RD	1	1	
12-033-200-13	BEDNAREK, PHILLIP G		0	0	BACK LOT
12-421-714-01	BEDNAREK, PHILLIP G	13829 LAKESIDE AVE	1	1	
12-461-722-01	BEELER TIMOTHY & NAN	7463 BAIR AVE	1	1	
12-461-735-07	BEELER TIMOTY & NAN	BAIR AVE	0	0	BACK LOT
12-031-100-01	BEGHTEL ALAN DEAN FAMILY		0	0	BACK LOT
12-221-707-09	BEGHTEL FAMILY TRUST	THREE PINES RD	1	1	
12-033-275-03	BELLEGIE LAURA ET AL		0	0	BACK LOT
12-421-708-02	BELLEGIE LAURA ET AL	13681 LAKESIDE AVE	1	1	
12-031-275-02	BENEDICT, MILBRY E. (LE)	6493 THREE PINES RD	1	1	
12-481-705-07	BINDAS, STEVEN P & BINDAS, STE	HOPKINS FOREST DR	0	0	BACK LOT
12-031-350-11	BINDAS, STEVEN PETER	13137 HOPKINS FOREST	1	1	
12-031-350-02	BISSIG, ENGRACIA ELIZABETH	13231 HOPKINS FOREST	1	1	
12-033-425-07	BOND, ROBERT & MARCIA (TRSTEES)		0	0	BACK LOT
12-441-703-03	BOND, ROBERT J & MARCIA K (TRS	13401 LAKESIDE AVE	1	1	
12-031-350-06	BRISBIN MARVIN & RITA		0	0	UNBUILDABLE
12-031-350-07	BRISBIN, MARVIN D & RITA	13171 HOPKINS FOREST	1	1	
12-481-704-05	BRISBIN, MARVIN D & RITA	HOPKINS FOREST DR	1	1	
12-461-723-00	BROOKS CHARLES A & RENGO AM	7491 BAIR AVE	1	1	
12-421-701-05	BROWN RANDY L & REGINA L	PETERS ST	1	1	
12-422-706-05	BROWN RANDY L & REGINA L	PETERS ST	0	0	BACK LOT
12-028-350-06	BUELL, ROBERT I.		1	1	
12-028-350-08	BUELL, ROBERT I.		0	0	UNBUILDABLE
12-442-702-01	BURLEY JOAN M	13067 PLEASANTON HW	0	0	UNBUILDABLE
12-442-701-05	BURLEY LINDA & BURLEY JOAN	PLEASANTON HWY	0	0	UNBUILDABLE
12-563-702-01	BURLEY REGINA & ROGER	13067 LAKESIDE AVE	1	1	

12-442-701-07	BURLEY ROGER ETAL	PLEASANTON HWY	0	0	UNBUILDABLE
12-442-702-03	BURLEY, REGINA M	PLEASANTON HWY	0	0	UNBUILDABLE
12-033-200-20	BURT, DALE CLARE & DONNA MAE (LE)		0	0	BACK LOT
12-421-710-01	BURT, DALE CLARE & DONNA MAE	13731 LAKESIDE AVE	1	1	
12-221-706-05	CAPUA, THOMAS L. SR & AMY P (T	6731 THREE PINES RD	1	1	
12-031-325-05	CAREY MICHAEL D	13317 HOPKINS FOREST	1	1	
12-481-701-02	CAREY MICHAEL D	HOPKINS FOREST DR	0	0	BACK LOT
12-423-702-30	CARRAHER, FRANK B	14149 HOUSER AVE	1	1	
12-028-350-13	CHMURA JOSEPH & CHMURA VIR	14047 LAKESIDE AVE	1	3	
12-028-350-12	CHMURA RICHARD J		1	1	
12-028-350-21	CHMURA RICHARD J		0	0	BACK LOT
12-031-350-10	CLARK, DAVID	HOPKINS FOREST DR	0	0	UNBUILDABLE
12-481-705-01	CLARK, DAVID	13152 HOPKINS FOREST	1	1	
12-461-702-05	CLAY, TONI L.	7043 BAIR AVE	1	1	
12-461-724-09	CLAY, TONI L	BAIR AVE	0	0	ACC BLDG
12-033-425-12	COLE, CARRIE J		0	0	BACK LOT
12-441-705-09	COLE, CARRIE J	13305 LAKESIDE AVE	1	1 1/4	
12-442-706-01	COLE, CARRIE J		0	0	UNBUILDABLE
12-028-350-20	CONROY FAMILY COTTAGE TRUST	14099 LAKESIDE AVE	1	1	
12-221-702-09	COOLEY-WALKER STEWARDSHIP G	6901 THREE PINES RD	1	1	
12-222-703-01	COOLEY-WALKER STEWARDSHIP G	THREE PINES RD	0	0	ACC BLDG
12-421-703-09	COWDEN, RONALD K (LE)	13569 LAKESIDE AVE	1	1	
12-562-701-04	COWIE RALPH & MARIANNA	O'ROURKE DR	0	0	BACK LOT
12-562-703-05	COWIE RALPH TRUST	HOPKINS FOREST DR	1	1	
12-033-425-08	COX JAMES W & DEBORAH A		0	0	BACK LOT
12-441-703-05	COX JAMES W & DEBORAH A	13379 LAKESIDE AVE	1	1	
12-442-708-01	COX JAMES W & DEBORAH A		0	0	UNBUILDABLE
12-222-705-01	CRAMPTON JOINT DECLARATION (	6823 THREE PINES RD	0	0	ACC BLDG
12-221-704-08	CRAMPTON, GAYLE J	6807 THREE PINES RD	1	1	
12-221-704-05	CRAMPTON, JEANNE	6823 THREE PINES RD	1	1	
12-031-200-03	CZARNECKI, BARBARA	6430 THREE PINES RD	1	1	
12-029-475-02	DAYTON BEAR LAKE OUTING CLUB		1	1	
12-422-701-09	DND OLSON FARM, LLC	EMERY ST	0	0	BACK LOT
12-033-200-06	DOUGLAS JAMES & CATHERINE		0	0	BACK LOT
12-421-718-05	DOUGLAS JAMES & CATHERINE	13925 LAKESIDE AVE	1	1 1/4	
12-031-200-02	DRIESENGA, DANIEL S (TRUST)		1	1	
12-031-350-03	DUPILKA JOS + DORIS	13217 HOPKINS FOREST	1	1	
12-481-702-06	DUPILKA JOSEPH & DORIS	HOPKINS FOREST DR	0	0	BACK LOT
12-031-200-40	DYKHUIS, DANIEL JAMES	6410 THREE PINES RD	1	1	
12-461-717-01	EARDLEY, CHARLES H	7365 BAIR AVE	1	1	
12-461-733-01	EARDLEY, CHARLES H	BAIR AVE	0	0	BACK LOT
12-461-706-01	EATON FAMILY TRUST	7123 BAIR AVE	1	1	
12-461-726-07	EATON FAMILY TRUST	BAIR AVE	0	0	BACK LOT
12-221-702-02	ECKHOUT MICHAEL	6941 THREE PINES RD	1	1	
12-481-704-01	ECKHOUT, MARYBETH	13200 HOPKINS FOREST	1	1	
12-441-704-09	EDGREN, ALAN J & GAIL D	13347 LAKESIDE AVE	1	1	
12-421-705-01	EGGERS BRUCE GORDON & ANNE	13601 LAKESIDE AVE	1	1	
12-421-705-09	EISENLOHR ROBERT & PATRICIA	13615 LAKESIDE AVE	1	1	
12-422-703-00	EISENLOHR ROBERT L & PATRICIA D		0	0	BACK LOT
12-221-706-01	EMBURY JAMES L & JAMES T	THREE PINES RD	1	1	
12-222-706-05	EMBURY JAMES L & JAMES T	THREE PINES RD	0	0	BACK LOT

12-221-705-09	EMBURY MABEL & JAMES T	6759 THREE PINES RD	1	1	
12-222-706-03	EMBURY MABEL & JAMES T	THREE PINES RD	0	0	ACC BLDG
12-421-701-03	EMINGER A CHARLES & BARBARA	13517 LAKESIDE AVE	1	1	
12-422-709-01	EMINGER A CHARLES & BARBARA	PETERS ST	0	0	BACK LOT
12-422-709-03	EMINGER A CHARLES & BARBARA	PETERS ST	0	0	BACK LOT
12-423-706-40	ENGLAND MELVIN S & NANCY M	14188 HOWELL AVE	1	1	
12-461-708-01	ENNIS MICHAEL & SUSAN	7161 BAIR AVE	1	1	
12-461-727-10	ENNIS, MICHAEL	BAIR AVE	0	0	ACC BLDG
12-031-200-10	ERICKSON, BRIAN LEE & SHANNON	6450 THREE PINES RD	1	1	
12-562-701-07	ERTEL DAVID E & SANDRA	HOPKINS FOREST DR	0	0	ACC BLDG
12-562-703-03	ERTEL DAVID E & SANDRA	13063 HOPKINS FOREST	1	1	
12-461-701-01	EW VENTURES, LLC	7019 BAIR AVE	1	1 1/4	
12-461-724-01	EW VENTURES, LLC	BAIR AVE	0	0	ACC BLDG
12-442-701-02	FAUZ, SUSAN	PLEASANTON HWY	0	0	UNBUILDABLE
12-031-325-01	FINOUT, III., GUY E & LINDA L		1	1	
12-031-150-02	FISHEL JAMES		1	1	
12-031-125-01	FISHEL JAMES L		0	0	ACC BLDG
12-221-702-04	FLEMING TOM & FRANCES	6931 THREE PINES RD	1	1	
12-222-702-03	FLEMING TOM & FRANCES	THREE PINES RD	0	0	ACC BLDG
12-222-703-07	FLEMING, THOMAS M	6870 THREE PINES RD	1	1	
12-031-125-02	FOSTER, BEVERLY	THREE PINES RD	0	0	ACC BLDG
12-221-710-07	FOSTER, BEVERLY	6527 THREE PINES RD	1	1	
12-033-425-11	FRONK WILLIAM & NANCY TRUSTS		0	0	BACK LOT
12-441-705-05	FRONK WILLIAM R TRUST	13321 LAKESIDE AVE	1	1	
12-442-704-01	FRONK WILLIAM R TRUST	PLEASANTON HWY	0	0	UNBUILDABLE
12-221-707-02	GENUALDI JOHN & DEBRA	6695 THREE PINES RD	1	1	
12-222-707-05	GENUALDI JOHN M & DEBRA	THREE PINES RD	0	0	BACK LOT
12-423-702-10	GIARD JOEL R & BARBARA D TRUS	14181 HOUSER AVE	1	1	
12-421-704-05	GILMOUR DONALD & MARY	LAKESIDE AVE	1	1	
12-422-706-03	GILMOUR DONALD & MARY	PETERS ST	0	0	BACK LOT
12-031-125-06	GUNSELL RODNEY & ANNETTE K		0	0	ACC BLDG
12-221-707-05	GUNSELL RODNEY & ANNETTE K	6677 THREE PINES RD	1	1	
12-461-730-07	HAGUE, JR., DAVID	BAIR AVE	0	0	ACC BLDG
12-423-701-80	HALL DAVID C DDS & KAREN S	14170 DAYTON AVE	1	1	
12-028-350-15	HAMMER, PAUL S (LE)	14031 LAKESIDE AVE	1	1	
12-031-125-00	HAMP, JOHN & JERI LIVING TRUST	THREE PINES RD	0	0	ACC BLDG
12-031-150-01	HAMP, JOHN & JERI LIVING TRUST	6519 THREE PINES RD	1	1	
12-421-706-09	HANNAN, GRETCHEN R (TRUST)	13641 LAKESIDE AVE	1	1	
12-031-200-01	HARRIS BYRAN W & KIMBERLY	6325 BIG BAY RD	1	1	
12-033-425-02	HEYBOER, RANDALL		0	0	BACK LOT
12-441-701-01	HEYBOER, RANDALL	13489 LAKESIDE AVE	1	1 1/4	
12-423-701-60	HIETANEN PAUL W & NANCY L	14160 DAYTON AVE	1	1	
12-442-701-01	HMP FAMILY LLC	13015 LAKESIDE AVE	1	1	
12-033-425-09	HOBART, ALAN J & GAIL D		0	0	BACK LOT
12-423-702-60	HOLMEN, JAMES	14147 HOUSER AVE	1	1	
12-461-705-01	HOLT, ELEANOR LOUISE	7103 BAIR AVE	1	1	
12-461-726-03	HOLT, ELEANOR LOUISE	7103 BAIR AVE	0	0	BACK LOT
12-423-701-01	HORN, DAVID R & KAREN W(TR 50	14120 DAYTON AVE	1	1	
12-421-712-09	HOSPENTHAL, PAULETTE	13801 LAKESIDE AVE	1	1	
12-033-200-25	HOSPENTHAL, PAULETTE M		0	0	BACK LOT
12-423-705-40	HUBBARD DONALD J & ROBERTA A	14118 HOWELL AVE	1	1	

12-221-701-05	HYBZA EDWARD & JEANNE	6973 THREE PINES RD	1	1	
12-221-703-01	JENNINGS, MARTIN R & TERESA T	6891 THREE PINES RD	1	1	
12-222-703-03	JENNINGS, MARTIN R & TERESA T	THREE PINES RD	0	0	ACC BLDG
12-221-710-03	JOHNSON JEFF & JO ANN TRUST	6535 THREE PINES RD	1	1	
12-031-125-03	JOHNSON JEFFREY R & JOANN L TI	6530 THREE PINES	0	0	ACC BLDG
12-461-727-08	JOHNSON MARILYN	BAIR AVE	0	0	BACK LOT
12-461-728-01	JOHNSON MARILYN	BAIR AVE	0	0	ACC BLDG
12-033-450-05	JOHNSON, DARLENE	LAKESIDE AVE	0	0	BACK LOT
12-441-708-09	JOHNSON, DARLENE	13161 LAKESIDE AVE	1	1	
12-442-703-01	JOHNSON, DARLENE	PLEASANTON HWY	0	0	UNBUILDABLE
12-031-200-35	KACZMAREK PAUL & CYNTHIA	6400 THREE PINES ROAD	1	1	
12-031-200-50	KADZBAN JOSEPH & ELJEAN		1	1	
12-033-200-24	KANTOR, LAURA		0	0	BACK LOT
12-421-713-01	KANTOR, LAURA	13807 LAKESIDE AVE	1	1	
12-031-200-20	KASTELIC FAMILY REVOCABLE TRU	6438 THREE PINES RD	1	1	
12-401-701-02	KIESZKOWSKI, JAMES M. (TRUST)	13365 HOPKINS FOREST	1	1	
12-461-713-01	KINGERY, PAMELA	7265 BAIR AVE	1	1	
12-031-325-04	KNIGHT CHARLES & PHYLLIS A	13325 HOPKINS FOREST	1	1	
12-421-701-08	KNUTSON, DEAN E	13533 LAKESIDE AVE	1	1	
12-422-706-02	KNUTSON, DEAN E		0	0	BACK LOT
12-033-200-14	KOCH, DAVID J	LAKESIDE AVE	0	0	BACK LOT
12-033-200-15	KOCH, DAVID J		0	0	BACK LOT
12-033-200-26	KOCH, DAVID J	LAKESIDE AVE	0	0	BACK LOT
12-421-713-05	KOCH, DAVID J	13823 LAKESIDE AVE	1	1	
12-421-713-07	KOCH, DAVID J	LAKESIDE AVE	1	1	
12-031-350-13	KOLESAR JULIE ANN		1	1	
12-033-425-10	KONING JAMES & DIANE		0	0	BACK LOT
12-441-705-01	KONING JAMES & DIANE	13335 LAKESIDE AVE	1	1	
12-442-703-02	KRAUSE ARNOLD J ET UX	PLEASANTON HWY	0	0	UNBUILDABLE
12-442-703-03	KRAUSE MARLENE	PLEASANTON HWY	0	0	UNBUILDABLE
12-033-450-03	KRAUSE MARLENE J		0	0	BACK LOT
12-441-707-09	KRAUSE MARLENE J	13201 LAKESIDE AVE	1	1	
12-028-350-18	KRIGBAUM KAREN		0	0	BACK LOT
12-421-720-13	KRIGBAUM KAREN	13984 LAKESIDE AVE	1	1	
12-421-720-17	KRIGBAUM KAREN	LAKESIDE AVE	0	0	UNBUILDABLE
12-563-702-03	KUIPER, WILLIAM J & JUDY L (LE)	13055 LAKESIDE AVE	1	1	
12-563-702-07	KUMMER CHARLES W JR & LORRA	13031 LAKESIDE AVE	1	1	
12-442-701-03	LAATSCH DON & JANET	PLEASANTON HWY	0	0	UNBUILDABLE
12-563-702-05	LAATSCH DON & JANET	13043 LAKESIDE AVE	1	1	
12-031-325-09	LADUKE, ALLAN J (LE)	13241 HOPKINS FOREST	1	1	
12-033-200-11	LAKESIDE COTTAGES AT BEAR LAK	13849 LAKESIDE AVE	1	1	
12-421-714-10	LAKESIDE COTTAGES AT BEAR LAK	13849 LAKESIDE AVE	1	1	
12-423-704-50	LARUE (HUMPHREYS), PAULA	14173 HOWELL AVE	1	1	
12-423-703-90	LENZ JAMES F & KAYE C	14168 HOUSER AVE	1	1	
12-423-703-40	LENZ, SCOTT & KELLY (50% INT)	HOUSER AVE	1	1	
12-031-125-05	MALLISON, KEVIN		0	0	ACC BLDG
12-221-708-01	MALLISON, KEVIN	6649 THREE PINES RD	1	1	
12-401-701-03	MANNING FAMILY TRUST	13377 HOPKINS FOREST	1	1	
12-401-701-05	MANNING, JANE	13393 HOPKINS FOREST	1	1	
12-028-350-11	MARLOW, JEFFREY	14051 LAKESIDE AVE	1	1	
12-423-703-60	MARTIN SARA ANN	14134 HOUSER AVE	1	1	

12-221-706-08	MARTIN, ANNE T	6715 THREE PINES RD	1	1	
12-222-707-01	MARTIN, ANNE T		0	0	BACK LOT
12-033-200-16	MARTON, JOHN LUCAS		0	0	BACK LOT
12-421-712-05	MARTON, JOHN LUCAS	13797 LAKESIDE AVE	1	1	
12-221-701-04	MARTTILA, CHRISTOPHER JOHN	6977 THREE PINES RD	1	1	
12-222-701-01	MARTTILA, CHRISTOPHER JOHN	THREE PINES RD	0	0	ACC BLDG
12-461-718-05	MATHIEU MADELEINE TRUST	BAIR AVE	0	0	BACK LOT
12-461-733-07	MATHIEU MADELEINE TRUST	BAIR AVE	0	0	BACK LOT
12-461-734-01	MATHIEU MADELEINE TRUST	BAIR AVE	0	0	ACC BLDG
12-461-719-01	MATHIEU MADELINE TRUST	7413 BAIR AVE	1	1	
12-028-350-22	MAY JOAN R TRUST	14079 LAKESIDE AVE	1	1	
12-028-325-09	MAY JOANN TRUST	LAKESIDE AVE	0	0	BACK LOT
12-461-721-05	MCBRIDE JEFFERY W & ANNA TRU	7453 BAIR AVE	1	1	
12-461-735-03	MCBRIDE JEFFERY W & ANNA TRU	BAIR AVE	0	0	BACK LOT
12-461-735-05	MCBRIDE JEFFERY W & ANNA TRU	BAIR AVE	0	0	BACK LOT
12-031-125-08	MCCARTHY KAREN S		0	0	ACC BLDG
12-221-709-03	MCCARTHY KAREN S	6589 THREE PINES RD	1	1	
12-033-450-01	MCCRACKEN BROTHERS LLC		0	0	BACK LOT
12-441-706-10	MCCRACKEN BROTHERS LLC	13225 LAKESIDE AVE	1	1 1/4	
12-442-703-10	MCCRACKEN BROTHERS LLC	LAKESIDE AVE	0	0	UNBUILDABLE
12-028-350-09	MCGILLIARD, JOHN H	14063 LAKESIDE AVE	1	1	
12-562-703-07	MIEHLKE TODD J & ROBIN	HOPKINS FOREST DR	1	1	
12-562-701-08	MINER, JOHN	HOPKINS FOREST DR	1	1	
12-028-350-10	MITCHELL, KRISTINE A (TRUST)	14059 LAKESIDE AVE	1	1	
12-031-275-03	MOGK WILLIAM C TRUST	6499 THREE PINES RD	1	1	
12-031-275-01	MOGK, PETER E (TRUSTEE)		1	1	
12-221-701-10	MOORE RICHARD W & MARCIA	6951 THREE PINES RD	1	1 1/4	
12-401-701-09	MORIN, GARY	HOPKINS FOREST DR	1	1	
12-423-704-20	MORRIS, DANIEL R	14186 HOUSER AVE	1	1	
12-423-705-60	NAYLOR RONALD & CYNTHIA TRUS	14134 HOWELL AVE	1	1	
12-421-716-05	NELSON FREDOLF & DELORES	13883 LAKESIDE AVE	1	1	
12-033-200-09	NELSON FREDOLF O & DELORES M	LAKESIDE AVE	0	0	BACK LOT
12-031-275-04	NORKUS, SANDRA S	6489 THREE PINES RD	1	1	
12-423-703-20	OBLINGER JON C ETAL	14116 HOUSER AVE	2/3	2/3	
12-423-705-10	O'HARE, RICHARD RAYMOND	14137 HOWELL AVE	1	1	
12-033-200-12	OLIVER JANE S TRUST		0	0	BACK LOT
12-421-714-05	OLIVER JANE S TRUST	13841 LAKESIDE AVE	1	1	
12-031-200-05	OLSON ALDEN C & BARBARA H		1	1	
12-421-707-02	OLSON, DOUGLAS S	13651 LAKESIDE AVE	1	1	
12-421-707-05	OLSON, II., LEONARD W	13657 LAKESIDE AVE	1	1	
12-031-325-07	O'ROURKE DOROTHY H ETAL	13297 HOPKINS FOREST	1	1	
12-481-701-06	O'ROURKE DOROTHY H ETAL	HOPKINS FOREST DR	0	0	BACK LOT
12-461-716-01	OWENS, DAN L	7341 BAIR AVE	1	1	
12-461-732-05	OWENS, DAN L	BAIR AVE	0	0	ACC BLDG
12-423-701-20	OZDEN, ELIZABETH H (TRUST) (509	14130 DAYTON AVE	1	1	
12-461-715-01	PARKS FAMILY TRUST	7319 BAIR AVE	1	1	
12-461-732-01	PARKS FAMILY TRUST	BAIR AVE	0	0	ACC BLDG
12-033-425-04	PARRAMORE, DOUGLAS C (TRSTEE)		0	0	BACK LOT
12-441-702-01	PARRAMORE, DOUGLAS C (TRSTEE	13453 LAKESIDE AVE	1	1	
12-442-710-07	PARRAMORE, DOUGLAS C (TRSTEE)		0	0	UNBUILDABLE
12-033-450-02	PEDERSON TIMOTHY		0	0	BACK LOT

12-442-703-09	PEDERSON TIMOTHY	PLEASANTON HWY	0	0	UNBUILDABLE
12-441-707-05	PEDERSON TIMOTHY TRUST	13211 LAKESIDE AVE	1	1	
12-033-450-06	PEDERSON, NANCY	13010 LAKESIDE AVE	1	1	
12-401-701-07	PELHAM LORI W & WOODRUFF SC	13409 HOPKINS FOREST	1	1	
12-221-701-07	PELLEGRINO JOSEPH TRUST	6965 THREE PINES RD	1	1	
12-222-701-03	PELLEGRINO JOSEPH TRUST	THREE PINES RD	0	0	BACK LOT
12-031-200-25	PERALTA, PHILLIP (TRUST)	6370 THREE PINES RD	1	1	
12-563-701-07	PETERSON, ROBERT N	13095 LAKESIDE AVE	1	1	
12-461-714-01	PETROELJE LARRY TRUST	7297 BAIR AVE	1	1	
12-461-731-03	PETROELJE LARRY TRUST	BAIR AVE	0	0	BACK LOT
12-421-706-05	PIKE ELLSWORTH S & BEVERLY J	13631 LAKESIDE AVE	1	1	
12-421-701-10	PIPER ACCESS LLC		1	1	
12-422-706-09	PIPER ACCESS LLC		0	0	BACK LOT
12-562-703-01	PLAGANY ROBERT ETAL	13033 HOPKINS FOREST	1	1	
12-031-200-07	PLEASANTON TOWNSHIP		0	0	EXEMPT
12-033-150-02	PLEASANTON TOWNSHIP		0	0	EXEMPT
12-421-705-10	PLEASANTON TOWNSHIP	LAKESIDE AVE	0	0	EXEMPT
12-421-707-01	PLEASANTON TOWNSHIP	LAKESIDE AVE	0	0	EXEMPT
12-422-701-01	PLEASANTON TOWNSHIP		0	0	EXEMPT
12-422-704-05	PLEASANTON TOWNSHIP		0	0	EXEMPT
12-421-704-01	POGGENDORF, RICHARD J	13575 LAKESIDE AVE	1	1	
12-422-706-08	POGGENDORF, RICHARD J	PETERS ST	0	0	BACK LOT
12-442-702-07	POWELL, ROBERT L.	PLEASANTON HWY	0	0	UNBUILDABLE
12-563-701-01	POWELL, ROBERT L.	13141 LAKESIDE AVE	1	1	
12-033-200-05	QUACKENBUSH JOHN & DEBRA	LAKESIDE AVE	0	0	BACK LOT
12-421-718-09	QUACKENBUSH JOHN & DEBRA	13933 LAKESIDE AVE	1	1	
12-442-710-01	R & B DEVELOPMENT INC		0	0	UNBUILDABLE
12-421-706-01	RAHN DAVID & NAN	13625 LAKESIDE AVE	1	1 1/4	
12-423-703-10	RAIFF FAMILY TRUST	14111 HOUSER AVE	1	1	
12-033-425-05	REIDY THOMAS P TRUST		0	0	BACK LOT
12-441-702-06	REIDY THOMAS P TRUST	13429 LAKESIDE AVE	1	1	
12-033-200-01	RENGO PHILLIP		0	0	BACK LOT
12-421-720-05	RENGO PHILLIP E	13971 LAKESIDE AVE	1	1	
12-033-200-00	RENGO RENA ETAL		0	0	BACK LOT
12-421-720-09	RENGO RENA ETAL	13979 LAKESIDE AVE	1	1	
12-221-703-07	RICHARDS, BRIAN G	6863 THREE PINES RD	1	1	
12-461-722-05	RICHMOND RODERIC & RICHMON	BAIR AVE	1	1	
12-461-736-01	RICHMOND RODERIC & RICHMON	BAIR AVE	0	0	UNBUILDABLE
12-421-702-01	RILEY, PATRICK & KIMBERLY	13535 LAKESIDE AVE	1	1 1/8	
12-421-702-03	RILEY, PATRICK & KIMBERLY	13535 LAKESIDE AVE	1	1 1/8	
12-422-706-07	RILEY, PATRICK & KIMBERLY		0	0	BACK LOT
12-562-701-03	ROBERTS, JOHN T	HOPKINS FOREST DR	0	0	BACK LOT
12-562-701-05	ROBERTS, JOHN T	13023 HOPKINS FOREST	1	1	
12-033-200-17	ROHN GERALD R & SHARON		0	0	BACK LOT
12-421-712-01	ROHN GERALD R & SHARON K	13787 LAKESIDE AVE	1	1	
12-033-450-04	ROLLENHAGEN FAMILY TRUST	LAKESIDE AVE	0	0	BACK LOT
12-441-708-05	ROLLENHAGEN FAMILY TRUST	13181 LAKESIDE AVE	1	1	
12-442-703-05	ROLLENHAGEN FAMILY TRUST	PLEASANTON HWY	0	0	UNBUILDABLE
12-221-703-05	ROLLENHAGEN, NATHAN	6873 THREE PINES RD	1	1	
12-028-325-01	ROWLAND WM E ETAL		1	1	
12-028-350-07	ROWLAND WM E ETAL	14107 LAKESIDE AVE	1	1	

12-562-701-01	RUSSELL RICHARD L & PHYLLIS TRU	13 MILE RD	0	0	BACK LOT
12-562-701-09	RUSSELL, RICHARD L & PHYLLIS TR	13086 HOPKINS FOREST	1	1	
12-442-706-05	RYE OSCAR & MARILYN A		0	0	UNBUILDABLE
12-441-706-05	RYE OSCAR WILLIAM & MARILYN	13271 LAKESIDE AVE	1	1	
12-033-425-13	RYE OSCAR WILLIAM & MARILYN A		0	0	BACK LOT
12-563-701-05	SAUNDERS, DAVID	13107 LAKESIDE AVE	1	1	
12-563-701-03	SAUNDERS, DAVID A	13121 LAKESIDE AVE	1	1	
12-421-707-09	SAVASKY, THOMAS MARTIN	13665 LAKESIDE AVE	1	1	
12-033-200-10	SAWYER, PAUL L	13871 LAKESIDE AVE	1	1	
12-421-715-09	SAWYER, PAUL L	13871 LAKESIDE AVE	1	1	
12-031-325-10	SCHAFER GEORGE W TRUST		0	0	BACK LOT
12-481-702-01	SCHAFER GEORGE W TRUST	HOPKINS FOREST DR	0	0	BACK LOT
12-031-325-08	SCHAFER, GEORGE W TRUST		1	1	
12-031-350-04	SCHEBECK, TIMOTHY	13213 HOPKINS FOREST	1	1	
12-028-350-16	SCHMIDT ROBERT P & PATRICIA L	14025 LAKESIDE AVE	1	1	
12-221-709-01	SCHMIEDICKE DIANA B TRUST	6607 THREE PINES RD	1	1	
12-031-125-04	SCHMIEDICKE DIANA TRUST		0	0	ACC BLDG
12-221-708-05	SCHMIEDICKE, DIANA (TRUST)	THREE PINES RD	1	1	
12-031-325-06	SCHNELL, FREDRICK M	13311 HOPKINS FOREST	1	1	
12-481-701-07	SCHNELL, FREDRICK M	HOPKINS FOREST DR	0	0	BACK LOT
12-031-200-15	SCHOLL STEVEN & SANDRA		1	1	
12-033-425-06	SCHOPP TRUST		0	0	BACK LOT
12-441-703-01	SCHOPP TRUST	13415 LAKESIDE AVE	1	1	
12-033-200-07	SCHULTZ ANTHONY & MARILYN		0	0	BACK LOT
12-421-718-01	SCHULTZ ANTHONY & MARILYN	13919 LAKESIDE AVE	1	1 1/4	
12-421-711-05	SCHWEYER DAVID J & LINDA	13773 LAKESIDE AVE	1	1	
12-033-200-18	SCHWEYER DAVID J & LINDA W		0	0	BACK LOT
12-031-125-07	SECHRIST, STEPHEN J		0	0	ACC BLDG
12-221-709-07	SECHRIST, STEPHEN J	6581 THREE PINES RD	1	1	
12-461-707-01	SHELLEY, MICHAEL H	7135 BAIR AVE	1	1	
12-461-727-05	SHELLEY, MICHAEL H	BAIR AVE	0	0	BACK LOT
12-031-200-30	SMITH, KELLY L (TRUST)	6386 THREE PINES RD	1	1	
12-221-705-03	SOMSEL DONALD R	6777 THREE PINES RD	1	1	
12-222-705-09	SOMSEL, DONALD R	THREE PINES RD	0	0	ACC BLDG
12-423-701-30	SORG NANCY M & THOMAS J	14140 DAYTON AVE	1	1	
12-423-705-80	SORG, THOMAS J	14148 HOWELL AVE	1	1	
12-221-701-03	SPAUST CHARLES J ETUX	6983 THREE PINES RD	1	1	
12-421-704-09	STACK, PETER	13593 LAKESIDE AVE	1	1 1/4	
12-422-704-01	STACK, PETER		0	0	BACK LOT
12-031-250-01	STATE OF MICH		0	0	EXEMPT
12-423-704-80	STEWART LAURIE A	14149 HOWELL AVE	1	1	
12-033-200-19	SWAIN DENNIS & WALLACE JACQUE		0	0	BACK LOT
12-421-709-01	SWALES JOHN & SANDRA	13701 LAKESIDE AVE	1	1	
12-033-275-01	SWALES JOHN & SANDRA		0	0	BACK LOT
12-033-275-02	SWALES JOHN & SANDRA		0	0	BACK LOT
12-031-350-12	SWAN LYNN R & MARGARET M	13123 HOPKINS FOREST	1	1	
12-461-721-01	SWANKER, AARON M	7443 BAIR AVE	1	1	
12-461-734-07	SWANKER, AARON M	BAIR AVE	0	0	BACK LOT
12-481-705-05	SWANSON ALLAN	13134 HOPKINS FOREST	1	1	
12-421-719-06	SWEETLAND, ALAN	13959 LAKESIDE AVE	1	1	
12-423-706-20	SWITT ROSE ANN ETAL	14174 HOWELL AVE	1	1	

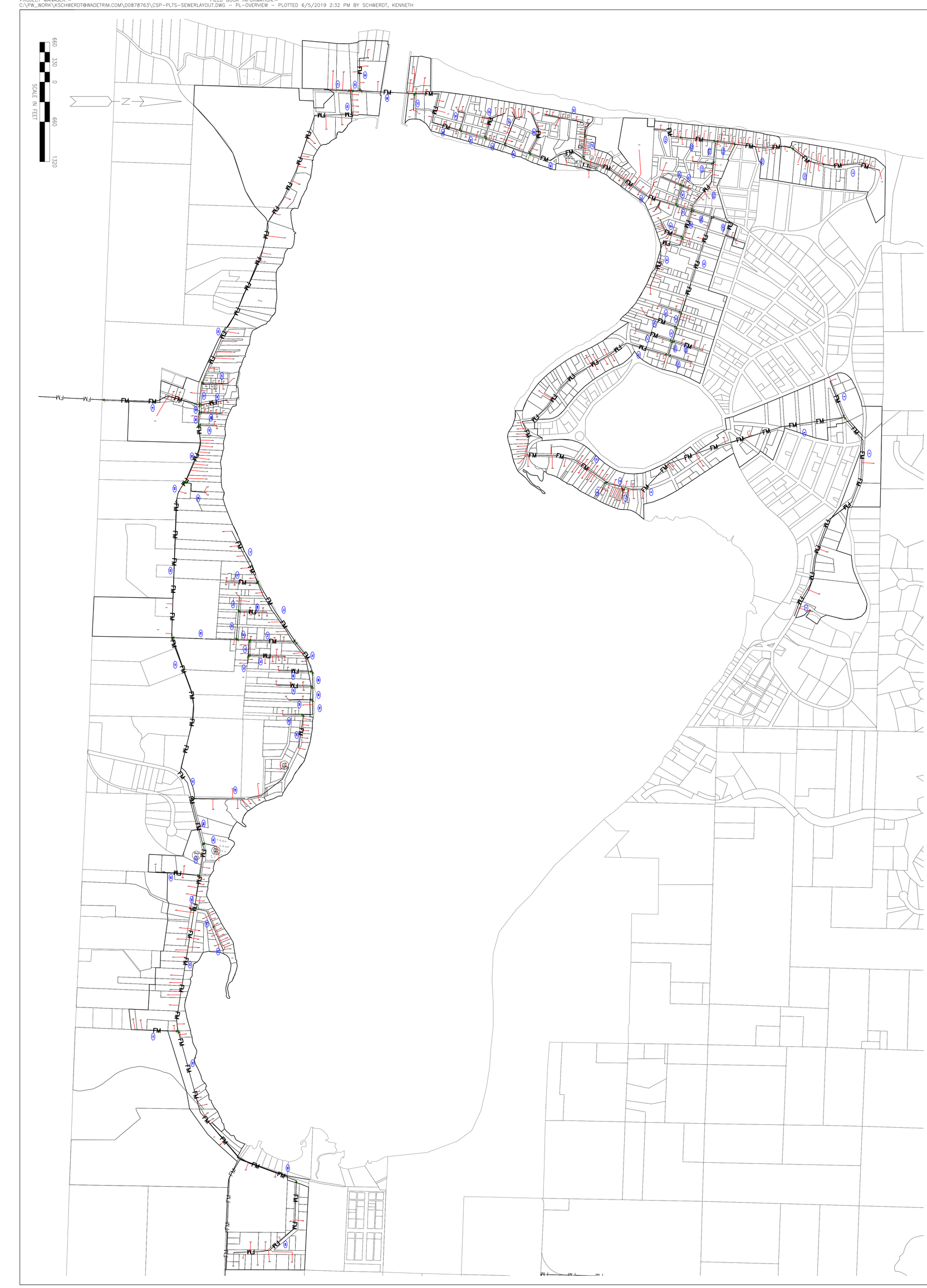
12-421-703-05	THIELMANN, JR., JOSEPH P	13561 LAKESIDE AVE	1	1	
12-422-707-01	THIELMANN, JR., JOSEPH P	PETERS ST	0	0	BACK LOT
12-461-730-01	THOMAS, CHRISTOPHER A	BAIR AVE	0	0	BACK LOT
12-471-151-00	THOMAS, CHRISTOPHER A	7229 BAIR AVE	1	1 1/4	
12-031-350-05	TOLFA JOHN & LYNN	13186 HOPKINS FOREST	1	1	
12-221-703-09	TOWNLEY LIVING TRUST	THREE PINES RD	1	1	
12-221-704-02	TOWNLEY LIVING TRUST	6835 THREE PINES RD	1	1	
12-222-703-10	TOWNLEY LIVING TRUST	THREE PINES RD	0	0	BACK LOT
12-222-704-01	TOWNLEY LIVING TRUST	THREE PINES RD	0	0	ACC BLDG
12-222-704-07	TOWNLEY LIVING TRUST	THREE PINES RD	0	0	BACK LOT
12-421-701-01	TURNER, WILLIAM H (TRUST)	13509 LAKESIDE AVE	1	1 1/2	
12-422-709-07	TURNER, WILLIAM H (TRUST)		0	0	BACK LOT
12-033-200-03	US BANK NATIONAL ASSOCIATION		0	0	BACK LOT
12-421-705-05	VAN SENUS, JR. WILLIAM F	13607 LAKESIDE AVE	1	1	
12-422-703-10	VAN SENUS, JR. WILLIAM F		0	0	BACK LOT
12-461-704-01	VANDENBOSCH REVOCABLE TRUS	7081 BAIR AVE	1	1	
12-461-725-05	VANDENBOSCH REVOCABLE TRUS	BAIR AVE	0	0	ACC BLDG
12-033-425-01	VANHOUTEN, GARY A (LE)		0	0	BACK LOT
12-033-425-03	VANHOUTEN, GARY A (LE)		0	0	BACK LOT
12-441-701-09	VANHOUTEN, GARY A (LE)	13469 LAKESIDE AVE	1	1	
12-441-701-13	VANHOUTEN, GARY A (LE)	13457 LAKESIDE AVE	1	1	
12-442-710-03	VANHOUTEN, GARY A (LE)		0	0	UNBUILDABLE
12-442-710-05	VANHOUTEN, GARY A (LE)		0	0	UNBUILDABLE
12-033-200-22	W.I.N.O. INC	LAKESIDE AVE	0	0	BACK LOT
12-421-711-01	W.I.N.O., INC	13741 LAKESIDE AVE	1	1 1/4	
12-221-702-05	WADE, BETTY	6915 THREE PINES RD	1	1	
12-222-702-05	WADE, BETTY	THREE PINES RD	0	0	ACC BLDG
12-421-710-11	WALLACE JACQUE L	13767 LAKESIDE AVE	1	1	
12-461-709-01	WALTHER, CATHERINE J (TRUST)	BAIR AVE	0	0	BACK LOT
12-461-710-01	WALTHER, CATHERINE J (TRUST)	7207 BAIR AVE	1	1	
12-461-711-01	WALTHER, CATHERINE J (TRUST)	BAIR AVE	0	0	ACC BLDG
12-461-729-01	WALTHER, CATHERINE J (TRUST)		0	0	ENCROACH
12-033-200-04	WARE ERNEST & DIANA		0	0	BACK LOT
12-421-719-01	WARE ERNEST & DIANA	13941 LAKESIDE AVE	1	1	
12-031-200-45	WATSELL JOHN & GEORGIANNA	6414 THREE PINES RD	1	1	
12-033-200-08	WEIMER, KENNETH		0	0	BACK LOT
12-421-717-01	WEIMER, KENNETH	13905 LAKESIDE AVE	1	1	
12-033-200-02	WESNER C EUGENE TRUST		0	0	BACK LOT
12-421-720-01	WESNER C EUGENE TRUST	13695 LAKESIDE AVE	1	1	
12-028-350-17	WIDICK, TIMOTHY J	14017 LAKESIDE AVE	1	1	
12-461-712-01	WILLIAMS, JACQUELINE A (TRUST)	7243 BAIR AVE	1	1	
12-461-730-03	WILLIAMS, JACQUELINE A (TRUST)	BAIR AVE	0	0	ACC BLDG
12-471-152-00	WILLIAMS, JACQUELINE A (TRUST)	BAIR AVE	0	0	BACK LOT
12-221-705-07	WINANS RANDALL	THREE PINES RD	1	1	
12-222-706-01	WINANS RANDALL	6762 THREE PINES RD	1	1	
12-461-702-01	WOLFF ERIC J & LEE A	7033 BAIR AVE	1	1	
12-461-724-05	WOLFF ERIC J & LEE A	BAIR AVE	0	0	BACK LOT
12-028-350-14	WOLVERTON CHARLES & SALLY		1	1	
12-423-703-21	WURSTNER ROBERT P	14116 HOUSER AVE	1/3	1/3	
12-423-703-30	WURSTNER, ROBERT P	14120 HOUSER AVE	1	1	
12-423-701-40	YOUNG, HEATHER J & ISRAEL, HAR	14150 DAYTON AVE	1	1	

12-033-425-14	ZEEUW BRUCE & DIANE		0	0	BACK LOT
12-441-706-09	ZEEUW BRUCE & DIANE	13257 LAKESIDE AVE	1	1	
12-442-706-10	ZEEUW BRUCE & DIANE		0	0	UNBUILDABLE
		total	**238**	**243.5**	

ATTACHMENT 2
COLLECTION SYSTEM MAPS

PROJECT MANAGER: –
C:\PW_WORK\KSCHWERDT@WADETRIM.COM\D0878763\CSP-PLTS-SEWERLAYOUT.DWG – PL-OVERVIEW – PLOTTED 6/5/2019 2:32 PM BY SCHWERDT, KENNETH

FIELD BOOK INFORMATION:–



TWO LAKES SEWER AUTHORITY
5435 MAIN ST
ONEKAMA, MI 49675
SEWER STUDY FOR USDA FINANCING APPLICATION

COLLECTION SEWER LAYOUT

SHEET

JOB NO. TLS2001.01C

ISSUED FOR: DATE: BY:

WADE TRIM
10850 East Traverse Highway, Suite 2260
Traverse City, MI 49684
231.947.7400
www.wadetrim.com

REV#	DATE	DESCRIPTION	BY

PROJECT MANAGER: –
FIELD BOOK INFORMATION:–
C:\PW_WORK\KSCHWERDT@WADETRIM.COM\D0878763\CSP-PLTS-SEWERLAYOUT.DWG – BL-OVERVIEW – PLOTTED 6/5/2019 2:35 PM BY SCHWERDT, KENNETH

SHEET

JOB NO.
TLS2001.01C

ISSUED FOR:
DATE:
BY:

TWO LAKES SEWER AUTHORITY
5435 MAIN ST
ONEKAMA, MI 49675
SEWER STUDY FOR USDA FINANCING APPLICATION

COLLECTION SEWER LAYOUT

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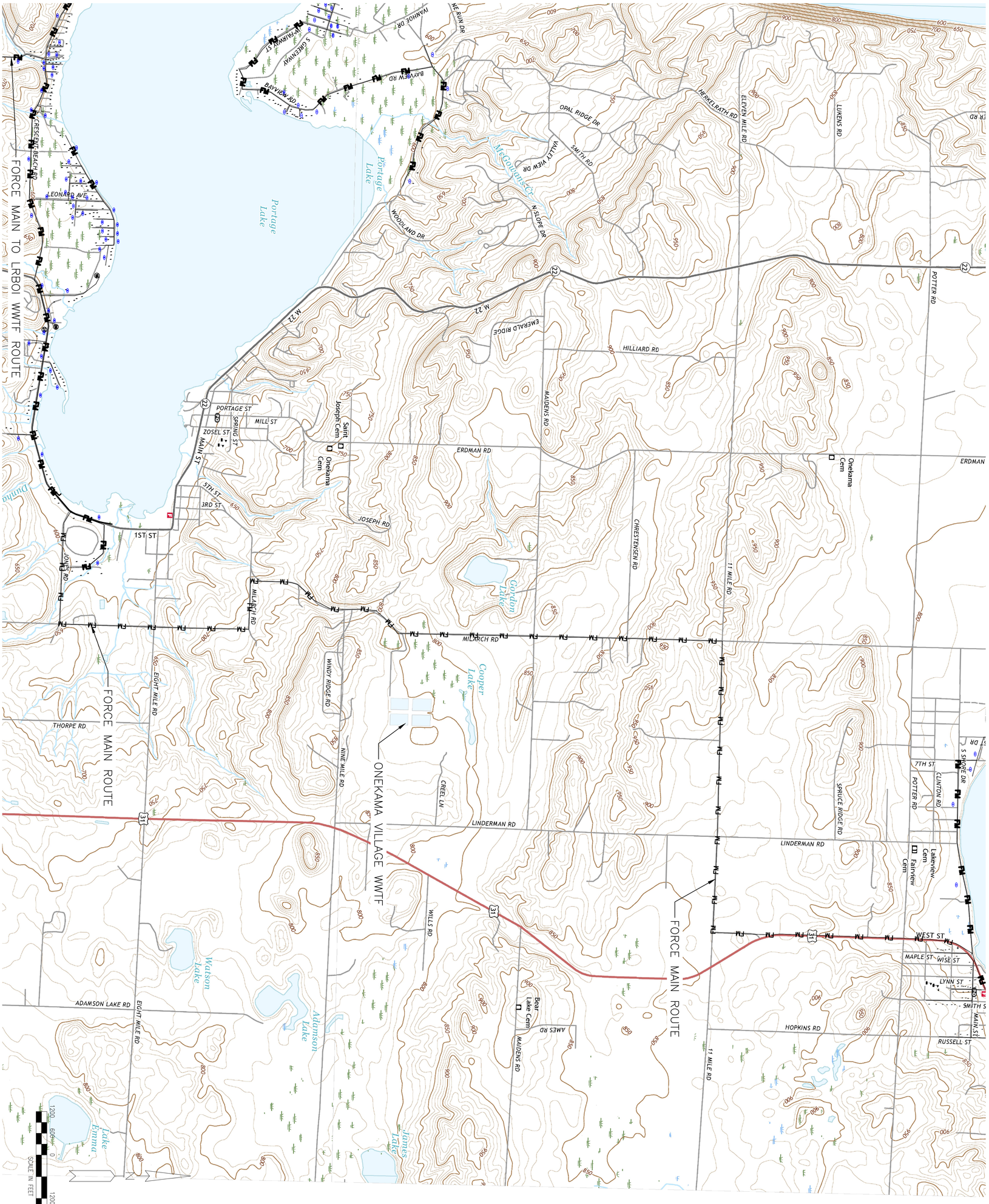
REV#	DATE	DESCRIPTION	BY

 TWO LAKES SEWER AUTHORITY

PROJECT MANAGER: –
C:\PW_WORK\KSCHWERDT@WADETRIM.COM\D0878763\CSP-PLTS-SEWERLAYOUT.DWG – BL TO PL FM – PLOTTED 6/5/2019 10:56 AM BY SCHWERDT, KENNETH

FIELD BOOK INFORMATION:–

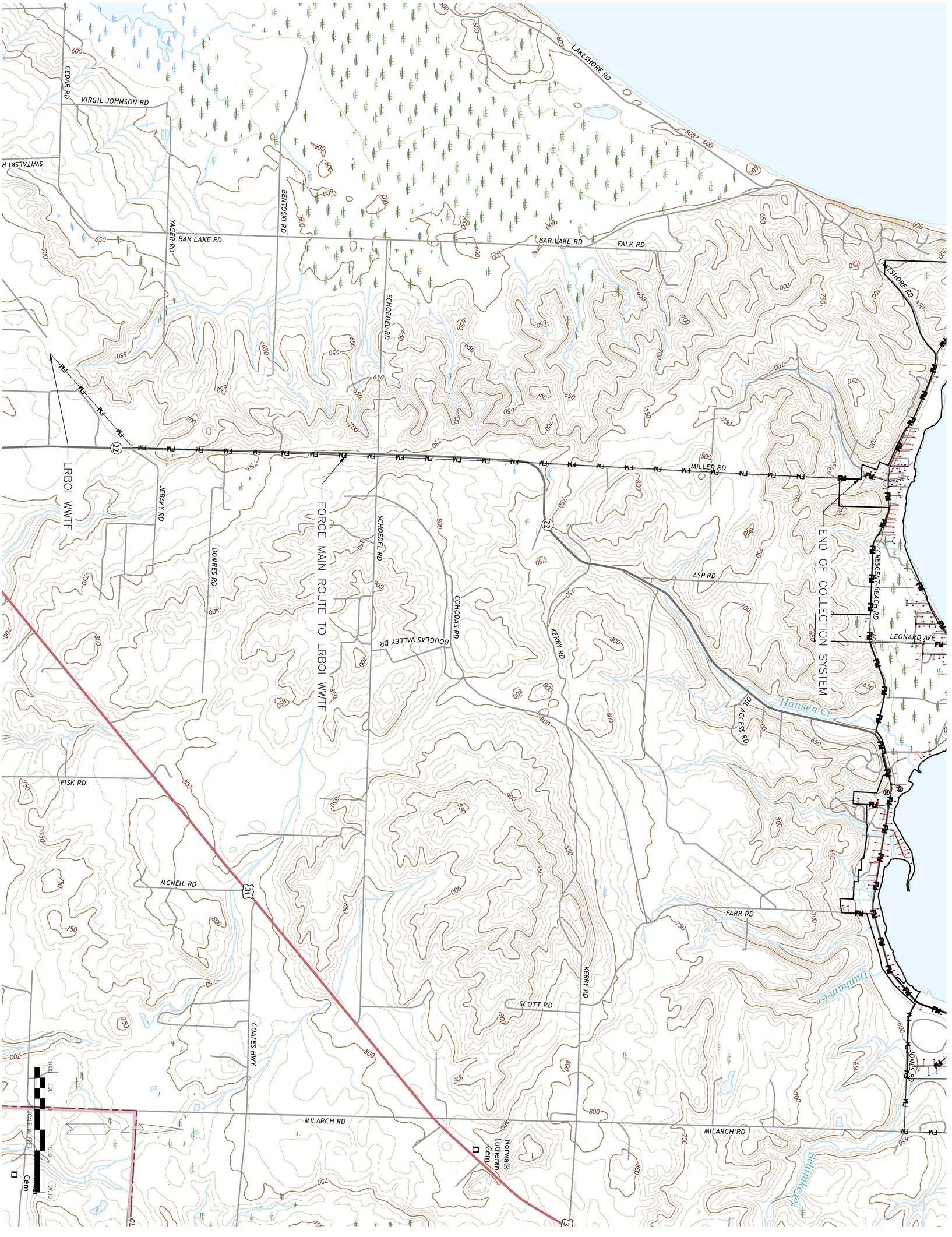


SHEET	JOB NO. TLS2001.01C	ISSUED FOR: DATE: BY:	TWO LAKES SEWER AUTHORITY 5435 MAIN ST ONEKAMA, MI 49675 SEWER STUDY FOR USDA FINANCING APPLICATION BEAR LAKE AREA SERVICE DISTRICT FORCE MAIN ROUTE BETWEEN COLLECTION SYSTEMS

WADE TRIM
10850 East Traverse Highway, Suite 2260
Traverse City, MI 49684
231.947.7400
www.wadetrim.com

REV#	DATE	DESCRIPTION	BY

 TWO LAKES SEWER AUTHORITY



TWO LAKES SEWER AUTHORITY
5435 MAIN ST
ONEKAMA, MI 49675

SEWER STUDY FOR USDA FINANCING APPLICATION
BEAR LAKE AREA SERVICE DISTRICT
COLLECTION SYSTEM TO LRBOI WWTF

JOB NO. TLS2001.01C
SHEET
ISSUED FOR:
DATE:
BY:

WADE TRIM
10850 East Traverse Highway, Suite 2260
Traverse City, MI 49684
231.947.7400
www.wadetrim.com

REV#	DATE	DESCRIPTION	BY

 TWO LAKES SEWER AUTHORITY

ATTACHMENT 3
PRESENT WORTH ANALYSIS

Collection System Present Worth Analysis

Community Name: **Two Lakes Sewer Authority**

Federal Discount Rate for Water Resources Planning (Interest Rate) i = 0.034

Number of Years, n = 40 years

Alternative 1: Low Pressure Sewer Collection	
Initial Capital Costs =	$29,583,000
Annual Operations & Maintenance Costs =	$420,000
Future Salvage Value =	$50,000
Present Worth of 40 years of O & M =	$9,109,927
Present Worth of 40 yr Salvage Value =	$13,126
Alternative 2 Total Present Worth =	$38,679,801

Alternative 2: STEP Collection	
Initial Capital Costs =	$27,383,000
Annual Operations & Maintenance Costs =	$390,000
Future Salvage Value =	$50,000
Present Worth of 40 years of O & M =	$8,459,218
PW =	**Annual OM *(1+i)^n-1 / i*(1+i)^n**
Present Worth of 40 yr Salvage Value =	$13,126
PW =	**FSV* 1 / (1 + i)^n**
Alternate 1 Total Present Worth =	$35,829,092

Present Worth Analysis

Community Name: Two Lakes Sewer Authority

Federal Discount Rate for Water Resources Planning (Interest Rate) i = 0.034

Number of Years, n = 40 years

Alternative 1	*Alternative 2*	*Alternative 3*	*Alternative 4*
Connection to LRBOI WWTP	**Onekama Village WWTP**	**TLSA Mech WWTP**	**TLSA Lagoon WWTP**
W/ STEP Collection System	**W/ STEP Collection System**	**W/ STEP Collection System**	**W/ STEP Collection System**
Initial Capital Costs = $35,215,000	**Initial Capital Costs =** $41,310,000	**Initial Capital Costs =** $35,694,000	**Initial Capital Costs =** $41,030,000
Annual Operations & Maintenance Costs = $983,600	**Annual Operations & Maintenance Costs =** $718,400	**Annual Operations & Maintenance Costs =** $702,000	**Annual Operations & Maintenance Costs =** $689,000
Future Salvage Value = $10,000	**Future Salvage Value =** $200,000	**Future Salvage Value =** $80,000	**Future Salvage Value =** $200,000
Present Worth of 40 years of O & M = $21,334,582	**Present Worth of 40 years of O & M =** $15,582,314	**Present Worth of 40 years of O & M =** $15,226,593	**Present Worth of 40 years of O & M =** $14,944,619
PW = Annual OM *$\frac{(1+i)^n-1}{i*(1+i)^n}$	**PW = Annual OM *$\frac{(1+i)^n-1}{i*(1+i)^n}$**	**PW = Annual OM *$\frac{(1+i)^n-1}{i*(1+i)^n}$**	**PW = Annual OM *$\frac{(1+i)^n-1}{i*(1+i)^n}$**
Present Worth of 40 yr Salvage Value = $2,625	**Present Worth of 40 yr Salvage Value =** $52,506	**Present Worth of 40 yr Salvage Value =** $21,002	**Present Worth of 40 yr Salvage Value =** $52,506
PW = FSV* $\frac{1}{(1+i)^n}$	**PW = FSV* $\frac{1}{(1+i)^n}$**	**PW = FSV* $\frac{1}{(1+i)^n}$**	**PW = FSV* $\frac{1}{(1+i)^n}$**
Alternate 1 Total Present Worth = $56,546,957	**Alternate 1 Total Present Worth =** $56,839,808	**Alternate 1 Total Present Worth =** $50,899,590	**Alternate 1 Total Present Worth =** $55,922,113

ATTACHMENT 4
PROJECT ALTERNATIVE COST ESTIMATES

Preliminary Engineer's Estimate

Two Lakes Sewer Authority
Total System
Low-Pressure Collection System
Manistee County, MI
May-19

The project estimate is Wade Trim's pre-design opinion of probable cost based upon the available information. Assumes one grinder pump station per connection, 1.25" service from grinder station to main in road.

	Description	Quantity	Unit	Unit Price	Amount
RD Eligible Collection Sanitary Sewer					
1	Mobilization (5%)	1	LS	$864,000.00	$864,000
2	Traffic Maintenance and Control	1	LS	$295,000.00	$295,000
3	Temporary Soil Erosion and Sedimentation Control	1	LS	$200,000.00	$200,000
4	Dewatering	1	LS	$600,000.00	$600,000
5	1.25" Dia, HDPE	93,500	LF	$18.00	$1,683,000
6	2" Dia, HDPE	36,300	LF	$21.00	$762,300
7	3" Dia, HDPE	25,000	LF	$26.00	$650,000
8	4" Dia, HDPE	34,700	LF	$31.00	$1,075,700
9	6" Dia, HDPE	29,800	LF	$38.00	$1,132,400
10	8" Dia, HDPE	1,700	LF	$46.00	$78,200
11	Air Release Structure	89	EA	$5,000.00	$445,000
12	Cleanout Structure	128	EA	$3,000.00	$384,000
13	Residential Ginder Pump Station, Simplex (DH071-93)	859	EA	$6,000.00	$5,154,000
14	Residential Group Ginder Pump Station, Simplex (DH152-93)	13	EA	$12,000.00	$156,000
15	Intermediate Submersible Pump Station, Duplex	4	EA	$150,000.00	$600,000
16	Transmission Submersible Pump Station, Duplex	2	EA	$200,000.00	$400,000
16	Protective Lining in Wet Well	6	EA	$12,000.00	$72,000
17	Activated Carbon Odor Control System	6	EA	$14,000.00	$84,000
18	Chemical Injection Equipment	3	LS	$150,000.00	$450,000
18	Permanent Stand-By Generator	6	EA	$75,000.00	$450,000
19	Property Acquisition	6	EA	$10,000.00	$60,000
20	8" SDR 35 PVC San Sewer main	7,150	LF	$40.00	$286,000
21	4' Dia Sanitary Manhloe	23	EA	$3,500.00	$80,500
22	4" Sanitary Service Line	5,300	LF	$25.00	$132,500
20	Asphalt	65,500	SY	$25.00	$1,637,500
21	Aggregate Shoulder	45,600	SY	$5.00	$228,000
22	Turf Establishment	75,100	SY	$2.00	$150,200

Estimated Construction Cost:	**$18,110,000**
Contingencies (10%):	**$1,811,000**
Engineering, Construction Services (25%):	**$4,980,300**
Transmission Sanitary Sewer Engineer's Estimate:	**$24,901,000**

	Description	Quantity	Unit	Unit Price	Amount
RD Non-Eligible Collection Sanitary Sewer					
1	Abandon Existing Septic Tanks	988	EA	$1,500.00	$1,482,000
2	Intercept Existing Service Line	988	EA	$1,000.00	$988,000
3	Electric service connection	935	EA	$1,000.00	$935,000

Estimated Construction Cost:	**$3,405,000**
Contingencies (10%):	**$340,500**
Engineering, Construction Services (25%):	**$936,400**
RD Non-Eligible Transmission Sanitary Sewer Engineer's Estimate:	**$4,682,000**

Operation & Maintenance

Two Lakes Sewer Authority

LPS Collection System
Manistee County, MI
May-19

Assumes 2 FT operator operator & 50 % of admin costs.

	Description	Annual Amount
Lagoon WWTP		
1	Personnel	$200,000
2	Administrative	$50,000
3	Energy	$6,000
4	Chemicals	$10,000
5	Monitoring and testing	$0
6	Profesional services	$5,000
7	Residuals Disposal	$0
8	Misc	$10,000
9	Short Term Assets	$139,000
	Total	**$420,000**

Short Term assets

Two Lakes Sewer Authority

LPS Collection System
Manistee County, MI
May-19

	Description	life expectancy	# of units	Replacement Cost	Annual Amount
STEP Collection					
1	Residential Pump	20	1000	$2,000.00	$100,000
2	Pump Controls	20	1000	$500.00	$25,000
3	LS pumps	20	12	$10,000.00	$6,000
4	LS Controls	20	6	$5,000.00	$1,500
5	Vehicles	10	2	$30,000.00	$6,000
			Estimated Construction Cost:		**$139,000**

Preliminary Engineer's Estimate

Two Lakes Sewer Authority
Total System
STEP Collection System
Manistee County, MI
May-19

The project estimate is Wade Trim's pre-design opinion of probable cost based upon the available information. Assumes one pump station per connection, 1.25" service from pump station to main in road.

	Description	Quantity	Unit	Unit Price	Amount
RD Eligible Collection Sanitary Sewer					
1	Mobilization (5%)	1	LS	$786,000.00	$786,000
2	Traffic Maintenance and Control	1	LS	$295,000.00	$295,000
3	Temporary Soil Erosion and Sedimentation Control	1	LS	$200,000.00	$200,000
4	Dewatering	1	LS	$600,000.00	$600,000
5	1.25" Dia, HDPE	93,500	LF	$18.00	$1,683,000
6	2" Dia, HDPE	36,300	LF	$21.00	$762,300
7	3" Dia, HDPE	25,000	LF	$26.00	$650,000
8	4" Dia, HDPE	34,700	LF	$31.00	$1,075,700
9	6" Dia, HDPE	29,800	LF	$38.00	$1,132,400
10	8" Dia, HDPE	1,700	LF	$46.00	$78,200
11	Air Release Structure	89	EA	$5,000.00	$445,000
12	Cleanout Structure	128	EA	$3,000.00	$384,000
13	Residential Pump Station, Orenco BPP PF10	935	EA	$4,000.00	$3,740,000
14	Intermediate Submersible Pump Station, Duplex	4	EA	$150,000.00	$600,000
15	Transmission Submersible Pump Station, Duplex	2	EA	$200,000.00	$400,000
16	Protective Lining in Wet Well	6	EA	$12,000.00	$72,000
17	Chemical Injection	3	EA	$150,000.00	$450,000
18	Activated Carbon Odor Control System	6	EA	$14,000.00	$84,000
19	Permanent Stand-By Generator	6	EA	$75,000.00	$450,000
20	Property Acquisition	6	EA	$10,000.00	$60,000
21	8" SDR 35 PVC San Sewer main	7,150	LF	$40.00	$286,000
22	4' Dia Sanitary Manhloe	23	EA	$3,500.00	$80,500
23	Sanitary Service Connection	53	EA	$500.00	$26,500
24	4" Sanitary Service Line	5,300	LF	$25.00	$132,500
21	Asphalt	65,400	SY	$25.00	$1,635,000
22	Aggregate Shoulder	45,500	SY	$5.00	$227,500
23	Turf Establishment	75,100	SY	$2.00	$150,200

Estimated Construction Cost:	**$16,486,000**
Contingencies (10%):	**$1,648,600**
Engineering, Construction Services (25%):	**$4,533,700**
RD Eligible Transmission Sanitary Sewer Engineer's Estimate:	**$22,668,000**

	Description	Quantity	Unit	Unit Price	Amount
RD Non-Eligible Collection Sanitary Sewer					
1	Pump Existing Septic Tanks	469	EA	$350.00	$164,150
2	Install New Septic Tanks	466	EA	$5,000.00	$2,330,000
3	Electric service connection	935	EA	$1,000.00	$935,000
4	Abandon Existing Septic Tank	53	EA	$1,500.00	$79,500

Estimated Construction Cost:	**$3,429,000**
Contingencies (10%):	**$342,900**
Engineering, Construction Services (25%):	**$943,000**
RD Non-Eligible Transmission Sanitary Sewer Engineer's Estimate:	**$4,715,000**
Total Transmission Sanitary Sewer Engineer's Estimate:	**$27,383,000**

Operation & Maintenance

Two Lakes Sewer Authority

STEP Collection System
Manistee County, MI
May-19

Assumes 2 FT operator & 50% of admin costs

	Description	Annual Amount
Lagoon WWTP		
1	Personnel	$200,000
2	Administrative	$50,000
3	Energy	$6,000
4	Chemicals	$10,000
5	Monitoring and testing	$0
6	Profesional services	$5,000
7	Residuals Disposal	$0
8	Misc	$10,000
9	Short Term Assets	$109,000
	Total	**$390,000**

Short Term assets

Two Lakes Sewer Authority

STEP Collection System
Manistee County, MI
May-19

	Description	life expectancy	# of units	Replacement Cost	Annual Amount
STEP Collection					
1	Residential Pump	20	1000	$1,000.00	$50,000
2	Pump Controls	20	1000	$500.00	$25,000
3	Pump Vault Filter pack	10	1000	$200.00	$20,000
4	LS pumps	20	12	$10,000.00	$6,000
5	LS Controls	20	6	$5,000.00	$1,500
6	Vehicles	10	2	$30,000.00	$6,000
			Estimated Construction Cost:		**$109,000**

Preliminary Engineer's Estimate

Two Lakes Sewer Authority

Connection to LRBOI Treatment System
Manistee County, MI
May-19

The project estimate is Wade Trim's pre-design opinion of probable cost based upon the available information. Connection and O&M costs provided by the LRBOI. Transmission costs include forcemain from the Bear lake Collection Area to the south side of Portage Lake, and the forcemain from Portage Lake South to the LRBOI treatment facility.

	Description	Quantity	Unit	Unit Price	Amount
WWTP					
1	TLSA Service Connection	1	EA	$296,150.00	$296,150
				Estimated Construction Cost:	**$296,000**
				Contingencies (0%):	**$0**
				Engineering, Construction Services (0%):	**$0**
				Mechanical WWTP Engineer's Estimate:	**$296,000**
Transmission Sanitary Sewer					
1	Mobilization (5%)	1	LS	$261,000.00	$261,000
2	Traffic Maintenance and Control	1	LS	$30,000.00	$30,000
3	Temporary Soil Erosion and Sedimentation Control	1	LS	$10,000.00	$10,000
4	Dewatering	1	LS	$10,000.00	$10,000
5	6" Dia, HDPE	74,000	LF	$38.00	$2,812,000
6	Pump Station, Self Priming	3	EA	$200,000.00	$600,000
7	Permanent Stand By Generator	3	EA	$75,000.00	$225,000
8	Protective Lining in Wet Well	3	EA	$10,000.00	$30,000
9	Activated Carbon Odor Control System	3	EA	$12,000.00	$36,000
10	Property Acquisition	3	EA	$20,000.00	$60,000
11	Electricity to Sites	3	EA	$10,000.00	$30,000
12	Air Release Structure	49	EA	$5,000.00	$245,000
13	Cleanout Structure	74	EA	$3,000.00	$222,000
7	Asphalt	14,800	SY	$25.00	$370,000
8	Aggregate Shoulder	14,800	SY	$4.00	$59,200
9	Chemical injection @ Pump Station	3	LS	$150,000.00	$450,000
10	Turf Establishment	14,800	SY	$2.00	$29,600
				Estimated Construction Cost:	**$5,479,800**
				Contingencies (10%):	**$548,000**
				Engineering, Construction Services (25%):	**$1,507,000**
				Transmission Sanitary Sewer Engineer's Estimate:	**$7,535,000**
				Total Engineer's Estimate:	**$7,831,000**

Operation & Maintenance

Two Lakes Sewer Authority

Connection to LRBOI WWTP
Manistee County, MI
May-19

Assumes 0.25 FT operator for lift station and force mains.

	Description	Annual Amount
Lagoon WWTP		
1	Treatment Cost @$8/1000 gal w/ 0.18 MGD	$525,600
2	Personnel	$25,000
3	Energy	$4,000
4	Chemicals	$15,000
5	Monitoring and testing	$0
6	Profesional services	$2,000
7	Residuals Disposal	$0
8	Misc	$2,000
9	Short Term Assets	$20,000
	Total	**$593,600**

Short Term assets

Two Lakes Sewer Authority

Connection to LRBOI WWTP
Manistee County, MI
May-19

	Description	life expectancy	# of units	Replacement Cost	Annual Amount
LS & FM Only					
1	Stand-By Generator	20	3	$80,000.00	$12,000
2	LS Pump Controls	20	3	$5,000.00	$750
3	LS pumps	20	6	$20,000.00	$6,000
4	Air Release Valve	20	49	$500.00	$1,225
			Estimated Construction Cost:		**$20,000**

Preliminary Engineer's Estimate

Two Lakes Sewer Authority

Connection to Onekama Village Owned Lagoon WWTP
Manistee County, MI
May-19

The project estimate is Wade Trim's pre-design opinion of probable cost based upon the available information. Assumes exisitng facility has no additional capacity and improvements are required to treat full TLSA anticipated flows.

	Description	Quantity	Unit	Unit Price	Amount
	Lagoon Site				
1	Land Acquisition, Purchase and Survey	40	Acre	$3,000.00	$120,000
2	Hydrogeological Investigation	1	LSUM	$50,000.00	$50,000
3	Clear and Grub	40	Acre	$2,000.00	$80,000
4	High Rate Lagoons earthwork	17,750	CY	$4.00	$71,000
5	High Rate Lagoons lining, 60 mil hdpe	180000	SF	$1.75	$315,000
6	Storage Lagoons earthwork	157,300	CY	$4.00	$629,200
7	Storage Lagoons aerators	6	EA	$15,000.00	$90,000
8	install power/cabling	6	EA	$25,000.00	$150,000
9	lining, storage lagoon, 60 mil hdpe	1,500,000	SF	$1.75	$2,625,000
10	Electrical Utility	1	LSUM	$25,000.00	$25,000
11	Electrical Sw Gr, MCC, Standby Receptacle	1	LSUM	$75,000.00	$75,000
12	Flow Control Manholes, 4' diameter	5	EA	$5,000.00	$25,000
13	Flow Control Manholes, 8' diameter	3	EA	$12,000.00	$36,000
14	12 inch PVC SDR 35 sewer(inc trench $18/LF)	1,400	LF	$42.27	$59,178
15	24 inch PVC SDR 35 sewer (inc trench18/lf)	2,000	LF	$67.89	$135,780
16	12 inch gate valves	18	EA	$7,300.00	$131,400
17	24 inch gate valves	2	EA	$25,000.00	$50,000
18	Manholes, 10 feet, pump station and valve vault	2	EA	$14,000.00	$28,000
19	18" gate valves	2		$36,000.00	$72,000
20	18" check valves	2		$38,000.00	$76,000
21	18" HDPE force main	6,000	LF	$94.00	$564,000
22	Pumps, 3000 gpm, Installed	2	EA	$75,000.00	$150,000
23	Storage Building	1	LSUM	$25,000.00	$25,000
	Irrigation Site				
23	Land Acquisition, Purchase from Onekama Village	72	Acre	$5,097.23	$367,001
24	Land Acquisition, Purchase and Survey	88	Acre	$3,000.00	$264,000
25	Clear and Grub	88	Acre	$1,000.00	$88,000
26	Land Leveling	88	Acre	$1,000.00	$88,000
27	Irrigation Pond earthwork	25,000	CY	$4.00	$100,000
28	Irrigation Pond lining	122,500	SF	$1.75	$214,375
29	Pump Station, Manhole wetwell, 8 feet	1	EA	$12,000.00	$12,000
30	Valve Vault	1	EA	$20,000.00	$20,000
31	6 inch gate valves	8	EA	$2,000.00	$16,000
32	6inch check valves	3	EA	$2,000.00	$6,000
33	6 inch DIP fittings in valve vault	1	LSUM	$6,000.00	$6,000

34	Centerpivot irrigator	3	EA	$45,000.00	$135,000
35	8 inch HDPE, Directionally Drilled	1,500	LF	$46.00	$69,000
36	FM, Magnetic, 6 inch	1	EA	$10,000.00	$10,000
37	electrical	1	LSUM	$10,000.00	$10,000

Estimated Construction Cost:	**$6,988,000**
Contingencies (10%):	**$698,800**
Engineering, Construction Services (25%):	**$1,747,000**
Lagoon WWTP Engineer's Estimate:	**$9,434,000**

Transmission Force Main to WWTF

1	Mobilization (5%)	1	LS	$156,000.00	$156,000
2	Traffic Maintenance and Control	1	LS	$30,000.00	$30,000
3	Temporary Soil Erosion and Sedimentation Control	1	LS	$10,000.00	$10,000
4	Dewatering	1	LS	$10,000.00	$10,000
5	6" Dia, HDPE	42,500	LF	$38.00	$1,615,000
6	Pump Station, Self Priming	2	EA	$200,000.00	$400,000
7	Permanent Stand By Generator	2	EA	$75,000.00	$150,000
8	Protective Lining in Wet Well	2	EA	$10,000.00	$20,000
9	Activated Carbon Odor Control System	2	EA	$12,000.00	$24,000
10	Property Acquisition	2	EA	$10,000.00	$20,000
11	Electricity to Sites	2	EA	$10,000.00	$20,000
12	Air Release Structure	29	EA	$5,000.00	$145,000
13	Cleanout Structure	43	EA	$3,000.00	$129,000
14	Asphalt	8,500	SY	$25.00	$212,500
15	Aggregate Shoulder	4,250	SY	$4.00	$17,000
16	Chemical injection @ Pump Station	2	LS	$150,000.00	$300,000
17	Turf Establishment	4,250	SY	$2.00	$8,500

Estimated Construction Cost:	**$3,267,000**
Contingencies (10%):	**$326,700**
Engineering, Construction Services (25%):	**$898,400**
Transmission Sanitary Sewer Engineer's Estimate:	**$4,492,000**
Total Project Engineer's Estimate:	**$13,926,000**

Operation & Maintenance

Two Lakes Sewer Authority

Connection to Onekama Village Owned Lagoon WWTP
Manistee County, MI
May-19

Assumes 0.5 FT operator & 50% of admin costs. Onekama service charge assumed as 1/4 of current Village customer O&M cost (0.25*$26.47 per month*1000 TLSA users*12 months)

	Description	Annual Amount
Lagoon WWTP		
1	Onekama Service Charge	$79,400
1	Personnel	$50,000
2	Administrative	$50,000
3	Energy	$35,000
4	Chemicals	$15,000
5	Monitoring and testing	$5,000
6	Profesional services	$5,000
7	Residuals Disposal	$50,000
8	Misc	$5,000
9	Short Term Assets	$34,000
	Total	**$328,400**

Short Term assets

Two Lakes Sewer Authority

Connection to Onekama Village Owned Lagoon WWTP
Manistee County, MI
May-19

	Description	life expectancy	# of units	Replacement Cost	Annual Amount
Lagoon WWTP					
1	aerator	15	6	$15,000.00	$6,000
2	effluent pump	15	2	$75,000.00	$10,000
3	irrigation pump	15	3	$15,000.00	$3,000
4	flow meter	15	1	$10,000.00	$667
5	misc monitoring and equipment	5	1	$5,000.00	$1,000
6	Generator	20	2	$80,000.00	$8,000
7	LS Pump Controls	20	2	$5,000.00	$500
8	LS pumps	20	4	$20,000.00	$4,000
9	Air Release Valve	20	29	$500.00	$725
				Estimated Annual Cost:	**$34,000**

Preliminary Engineer's Estimate

Two Lakes Sewer Authority

Aero-Mod WWTP
Manistee County, MI
May-19

The project estimate is Wade Trim's pre-design opinion of probable cost based upon the available information. Assumes no equalization basin is required, a surface discharge is allowed within 1 mile of WWTP site.

	Description	Quantity	Unit	Unit Price	Amount
WWTP					
1	Aero-Mod Equipment	1	LS	$583,000.00	$583,000
2	Equipment Installation	1	LS	$100,000.00	$100,000
3	Contrete Tanks for Plant	1	LS	$410,000.00	$410,000
4	Property Acquisition	10	Acre	$30,000.00	$300,000
5	Building, 45'x80'	1	LS	$600,000.00	$600,000
6	Building Electrical & Mechanical	1	LS	$100,000.00	$100,000
7	Site work	1	LS	$100,000.00	$100,000
8	Headworks	1	LS	$100,000.00	$100,000
				Estimated Construction Cost:	**$2,293,000**
				Contingencies (10%):	**$229,300**
				Engineering, Construction Services (25%):	**$573,300**
				Mechanical WWTP Engineer's Estimate:	**$3,096,000**
Surface Water Discharge					
1	Pump Station, 1,000 gpm	1	LS	$200,000.00	$200,000
2	Valve Vault	1	EA	$20,000.00	$20,000
3	FM, Magnetic, 6 inch	1	EA	$10,000.00	$10,000
4	electrical	1	LSUM	$10,000.00	$10,000
5	8" Dia, HDPE Forcemain, Directional Drill	6,000	LF	$46.00	$276,000
6	Air Release Structure	2	LS	$5,000.00	$10,000
7	Cleanout Structure	3	LS	$3,000.00	$9,000
				Estimated Construction Cost:	**$535,000**
				Contingencies (10%):	**$53,500**
				Engineering, Construction Services (25%):	**$133,800**
				Land Application Engineer's Estimate:	**$722,000**
				Total WWTP Engineer's Estimate:	**$3,818,000**
Transmission Force Main					
1	Mobilization (5%)	1	LS	$156,000.00	$156,000
2	Traffic Maintenance and Control	1	LS	$30,000.00	$30,000
3	Temporary Soil Erosion and Sedimentation Control	1	LS	$10,000.00	$10,000
4	Dewatering	1	LS	$10,000.00	$10,000
5	6" Dia, HDPE	42,500	LF	$38.00	$1,615,000
6	Pump Station, Self Priming	2	EA	$200,000.00	$400,000

7	Permanent Stand By Generator	2	EA	$75,000.00	$150,000
8	Protective Lining in Wet Well	2	EA	$10,000.00	$20,000
9	Activated Carbon Odor Control System	2	EA	$12,000.00	$24,000
10	Property Acquisition	2	EA	$10,000.00	$20,000
11	Electricity to Sites	2	EA	$10,000.00	$20,000
12	Air Release Structure	29	EA	$5,000.00	$145,000
13	Cleanout Structure	43	EA	$3,000.00	$129,000
14	Asphalt	8,500	SY	$25.00	$212,500
15	Aggregate Shoulder	4,250	SY	$4.00	$17,000
16	Chemical injection @ Pump Station	2	LS	$150,000.00	$300,000
17	Turf Establishment	4,250	SY	$2.00	$8,500

Estimated Construction Cost:	**$3,267,000**
Contingencies (10%):	**$326,700**
Engineering, Construction Services (25%):	**$898,400**
Transmission Force Main Engineer's Estimate:	**$4,492,000**
Total Project Engineer's Estimate:	**$8,310,000**

Operation & Maintenance

Two Lakes Sewer Authority

Aero-Mod WWTP
Manistee County, MI
May-19

Assumes 1 FT operator & 50% admin cost

	Description	Annual Amount
Lagoon WWTP		
1	Personnel	$100,000
2	Administrative	$50,000
3	Energy	$50,000
4	Chemicals	$15,000
5	Monitoring and testing	$5,000
6	Profesional services	$5,000
7	Residuals Disposal	$50,000
8	Misc	$10,000
9	Short Term Assets	$27,000
	Total	**$312,000**

Short Term assets

Two Lakes Sewer Authority

Aero-Mod WWTP
Manistee County, MI
May-19

	Description	life expectancy	# of units	Replacement Cost	Annual Amount
WWTP					
1	aeration blower	15	3	$15,000.00	$3,000
2	submerible mixer	15	1	$10,000.00	$667
3	airlift pump	15	2	$20,000.00	$2,667
4	air compressor	10	1	$5,000.00	$500
5	discharge pumps	15	2	$15,000.00	$2,000
5	flow meter	15	1	$10,000.00	$667
6	Stand-By Generator	20	1	$60,000.00	$3,000
7	misc monitoring and pnuematic equipment	5	1	$5,000.00	$1,000
8	Generator	20	2	$80,000.00	$8,000
9	LS Pump Controls	20	2	$5,000.00	$500
10	LS pumps	20	4	$20,000.00	$4,000
11	Air Release Valve	20	29	$500.00	$725
			Estimated Construction Cost:		**$27,000**

Preliminary Engineer's Estimate

Two Lakes Sewer Authority

TLSA Owned Lagoon WWTP
Manistee County, MI
May-19

The project estimate is Wade Trim's pre-design opinion of probable cost based upon the available information. Assumes a suitable treatment and land application site is found between the two collection areas.

	Description	Quantity	Unit	Unit Price	Amount
	Lagoon Site				
1	Land Acquisition, Purchase and Survey	40	Acre	$3,000.00	$120,000
2	Hydrogeological Investigation	1	LSUM	$50,000.00	$50,000
3	Clear and Grub	40	Acre	$2,000.00	$80,000
4	High Rate Lagoons earthwork	17,750	CY	$4.00	$71,000
5	High Rate Lagoons lining, 60 mil hdpe	180000	SF	$1.75	$315,000
6	Storage Lagoons earthwork	157,300	CY	$4.00	$629,200
7	Storage Lagoons aerators	6	EA	$15,000.00	$90,000
8	install power/cabling	6	EA	$25,000.00	$150,000
9	lining, storage lagoon, 60 mil hdpe	1,500,000	SF	$1.75	$2,625,000
10	Electrical Utility	1	LSUM	$25,000.00	$25,000
11	Electrical Sw Gr, MCC, Standby Receptacle	1	LSUM	$75,000.00	$75,000
12	Flow Control Manholes, 4' diameter	5	EA	$5,000.00	$25,000
13	Flow Control Manholes, 8' diameter	3	EA	$12,000.00	$36,000
14	12 inch PVC SDR 35 sewer(inc trench $18/LF)	1,400	LF	$42.27	$59,178
15	24 inch PVC SDR 35 sewer (inc trench18/lf)	2,000	LF	$67.89	$135,780
16	12 inch gate valves	18	EA	$7,300.00	$131,400
17	24 inch gate valves	2	EA	$25,000.00	$50,000
18	Manholes, 10 feet, pump station and valve vault	2	EA	$14,000.00	$28,000
19	18" gate valves	2		$36,000.00	$72,000
20	18" check valves	2		$38,000.00	$76,000
21	18" HDPE force main	6,000	LF	$94.00	$564,000
22	Pumps, 3000 gpm, Installed	2	EA	$75,000.00	$150,000
23	Storage Building	1	LSUM	$25,000.00	$25,000
	Irrigation Site				
24	Land Acquisition, Purchase and Survey	120	Acre	$3,000.00	$360,000
25	Clear and Grub	120	Acre	$1,000.00	$120,000
26	Land Leveling	120	Acre	$1,000.00	$120,000
27	Irrigation Pond earthwork	25,000	CY	$4.00	$100,000
28	Irrigation Pond lining	122,500	SF	$1.75	$214,375
29	Pump Station, Manhole wetwell, 8 feet	1	EA	$12,000.00	$12,000
30	Valve Vault	1	EA	$20,000.00	$20,000
31	6 inch gate valves	8	EA	$2,000.00	$16,000
32	6inch check valves	3	EA	$2,000.00	$6,000
33	6 inch DIP fittings in valve vault	1	LSUM	$6,000.00	$6,000

34	Centerpivot irrigator	3	EA	$45,000.00	$135,000
35	8 inch HDPE, Directionally Drilled	1,500	LF	$46.00	$69,000
36	FM, Magnetic, 6 inch	1	EA	$10,000.00	$10,000
37	electrical	1	LSUM	$10,000.00	$10,000

Estimated Construction Cost:	**$6,781,000**
Contingencies (10%):	**$678,100**
Engineering, Construction Services (25%):	**$1,695,300**
Lagoon WWTP Engineer's Estimate:	**$9,154,000**

Transmission Force Main to WWTF

1	Mobilization (5%)	1	LS	$156,000.00	$156,000
2	Traffic Maintenance and Control	1	LS	$30,000.00	$30,000
3	Temporary Soil Erosion and Sedimentation Control	1	LS	$10,000.00	$10,000
4	Dewatering	1	LS	$10,000.00	$10,000
5	6" Dia, HDPE	42,500	LF	$38.00	$1,615,000
6	Pump Station, Self Priming	2	EA	$200,000.00	$400,000
7	Permanent Stand By Generator	2	EA	$75,000.00	$150,000
8	Protective Lining in Wet Well	2	EA	$10,000.00	$20,000
9	Activated Carbon Odor Control System	2	EA	$12,000.00	$24,000
10	Property Acquisition	2	EA	$10,000.00	$20,000
11	Electricity to Sites	2	EA	$10,000.00	$20,000
12	Air Release Structure	29	EA	$5,000.00	$145,000
13	Cleanout Structure	43	EA	$3,000.00	$129,000
14	Asphalt	8,500	SY	$25.00	$212,500
15	Aggregate Shoulder	4,250	SY	$4.00	$17,000
16	Chemical injection @ Pump Station	2	LS	$150,000.00	$300,000
17	Turf Establishment	4,250	SY	$2.00	$8,500

Estimated Construction Cost:	**$3,267,000**
Contingencies (10%):	**$326,700**
Engineering, Construction Services (25%):	**$898,400**
Transmission Sanitary Sewer Engineer's Estimate:	**$4,492,000**
Total Project Engineer's Estimate:	**$13,646,000**

Operation & Maintenance
Two Lakes Sewer Authority

TLSA Owned Lagoon WWTP
Manistee County, MI
May-19

Assumes 1 FT operator & 50% of admin costs

	Description	Annual Amount
Lagoon WWTP		
1	Personnel	$100,000
2	Administrative	$50,000
3	Energy	$35,000
4	Chemicals	$15,000
5	Monitoring and testing	$5,000
6	Profesional services	$5,000
7	Residuals Disposal	$50,000
8	Misc	$5,000
9	Short Term Assets	$34,000
	Total	**$299,000**

Short Term assets

Two Lakes Sewer Authority

TLSA Owned Lagoon WWTP
Manistee County, MI
May-19

	Description	life expectancy	# of units	Replacement Cost	Annual Amount
Lagoon WWTP					
1	aerator	15	6	$15,000.00	$6,000
2	effluent pump	15	2	$75,000.00	$10,000
3	irrigation pump	15	3	$15,000.00	$3,000
4	flow meter	15	1	$10,000.00	$667
5	misc monitoring and equipment	5	1	$5,000.00	$1,000
6	Generator	20	2	$80,000.00	$8,000
7	LS Pump Controls	20	2	$5,000.00	$500
8	LS pumps	20	4	$20,000.00	$4,000
9	Air Release Valve	20	29	$500.00	$725
				Estimated Annual Cost:	**$34,000**

ATTACHMENT 5
LAGOON DESIGN

Two Lakes Sewer Authority

BASIS OF DESIGN

Lagoon System with Spray Irrigation System Seasonal Discharge

Introduction:

This Basis of Design is prepared to document the assumptions made for estimating project costs for the lagoon system option for wastewater treatment and disposal.

Influent Data:

Average Day Flow (ADF):	300,000 gpd (0.92 ac-ft/day) (208 gpm)
Maximum Day Flow (MDF)	450,000 gpd (312 gpm)
Maximum Instantaneous Flow	600,000 gpd (416 GPM)
BOD	250 mg/l (626 ppd)
Suspended Solids	250 mg/l (626 ppd)
Total Phosphorus	12 mg/l

All wastewater is from domestic sources, there is no allowance for industrial or agricultural contribution to the influent.

Lagoon Sizing

Primary Cells shall be aerated-facultative for odor control and relatively high degree of treatment. Assume an organic loading of 1 lbs BOD/1000 cf per day (43,560 lbs BOD/ac-ft per day), and 24 days detention time. The controlling parameter is detention time of 24 days, yielding a requirement of 22.08 ac-ft. Use two primary high rate aerated lagoon cells of 11 ac-feet each, max depth of 8 feet.

Aerators:

Assume floating, aspirating aerators, 3 Hp, 3 in each cell. Oxygen demand=1.1(Influent BOD)=1.1(626)=689 ppd.

Each 3 Hp aerator provides 2 lbs oxygen per HP-hour, for a total of 864 ppd oxygen provided.

Storage Requirements

Storage Time=7 months

Storage Requirement=7x30x.92=193.2 ac-ft. Use 6 storage cells, 32.5 ac-ft each, 7 feet max depth.

Lagoon Effluent Pumping

Assume filling the irrigation pond in four 8 hour days. So, provide two 3,000 gpm pumps (one standby). Assume 6,000 feet from lagoon effluent PS to irrigation pond.

Spray Irrigation Sizing

Assume 2 inches per week, or 1/6 ft per week for 5 months or 20 weeks, so .92 ac ft/day x 365 days=335.8 ac ft annual/(20 weeks/1/6 ft per week) = 100.74 acres. Assume three, forty acre fields, each with a center pivot spray irrigator.

Irrigation Pumping

Average minimum irrigation rate: 335.8 ac -ft in 20 weeks =2.4 ac-ft/day (782,000 gpd)(543 gpm). Assume actual application is 4 days/week, or 4.2 ac-ft/day (1,368,480 gpd)(950 gpm). Assume 3 irrigation pumps, each 475 gpm/40 psi, two operating 4 days a week for 20 weeks, alternating 40 acre fields and pumps as convenient, maintaining a max of 2 inches per week in each field.

Irrigation Pond

Assume the pond holds 7 days of flow at irrigation rates, or 7(2.4 ac-ft/day)=16.8 ac-ft. Make the pond 8 feet deep.

WADE TRIM

WORK SHEET

3 Hp ASPIRATING AERATOR EACH POND

HIGH RATE POND 11.0 ac-ft

HIGH RATE POND 11.0 ac-ft

Q_{AVG} = 300,000 gpd

INFLUENT

DISTRIBUTION BOX

12"

12"

12"

12"

12"

DIST VAULT

109,500,000 gpy

STORAGE PONDS

32.5 ac-ft each

32.5 ac-ft

32.5 ac-ft

32.5 ac-ft

32.5 ac-ft

32.5 ac-ft

12"

12"

12"

24" DRAIN SEWER

40 ACRE

40 ACRE CENTER PIVOT

40 ACRE

8"

8"

6"

VALVE/ DISTRIBUTION VAULT

IRRIGATION SPRAY PUMP STATION 475gpm each

24"

IRRIGATION POND 16.8 ac-ft

18" HDPE 6,000', V = 3.77

3,000gpm each pump

VALVE VAULT

LAGOON EFFLUENT PUMP STATION

SUBJECT	BY	CHK.	SHEET NO.	JOB NUMBER
TWO LAKES SEWER AUTHORITY — LAGOON TREATMENT	JWR		_____ OF _____	TLS·2001·01C
	DATE 5.14.19	DATE		

Form 25-1092

ATTACHMENT 6
MECHANICAL WWTP DESIGN

Aero-Mod, Inc.

ACTIVATED SLUDGE DESIGN CALCULATIONS

Project: Manistee County, MI
Engineer: Wade Trim
Act. Sludge Process: SEQUOX BNR

Date: 16-Mar-19
Units: English

DESIGN CONDITIONS & PARAMETERS

	Influent	Clarifier Effluent
Flow (Q), MGD	**0.180**	
BOD_5, mg/l	**240**	**10.0**
BOD_5, lbs/day	360	15.0
BOD_L, mg/l	351	
TSS, mg/l	**240**	**10.0**
TSS, lbs/day	360	15.0
Ammonia-N, mg/l	**35.0**	**1.0**
Ammonia-N, lbs/day	52.5	1.5
TIN, mg/l		**5.0**
TIN, lbs/day		7.5
Phosphorus-P, mg/l	**7.0**	**1.0**
Phosphorus-P, lbs/day	10.5	1.5
Net Alkalinity Loss, mg/l as $CaCO_3$		**(173)**

Aeration Basin	
Retention Time, hours	**24.0**
Aeration Tank Volume, Mgal	0.180
MCRT, days	**18.0**
Wastewater Temperature, ^oC	6
Aerobic Digester	
Volume, % of Aeration Tank	34.3
Maximum Solids Conc., mg/l	15,000
Maximum Solids Conc., %	1.50%
Digester Temperature, ^oC	6
Sludge Holding Tank	
Volume, % of Aeration Tank	0.0
Maximum Solids Conc., mg/l	25,000
Maximum Solids Conc., %	2.50%

PROJECTED OPERATING CONDITIONS - AERATION BASIN

Mixed Liquor Suspended Solids, mg/l		**3,410**
Excess MLSS due to Phos-P Uptake/Removal, mg/l	0	
Mixed Liquor Volatile Suspended Solids, %		74%
F/M Ratio, lbs BOD_5/lb MLVSS		0.09
F/M Ratio, lbs BOD_5/lb MLSS		0.07
Organic Loading, lbs BOD_5/1000 cf of tank/day		15.0
Oxygen Requirements (Carbonaceous), mg/l/hr		8.12
Oxygen Requirements (Nitrogenous), mg/l/hr		6.52
Solids Production, lbs/day		284
WAS - Solids Wasted per Day, lbs/day		269
WAS - Solids Wasted per Day, gal/day @	0.34%	9,472

PROJECTED OPERATING CONDITIONS - AEROBIC DIGESTER

Volatile Solids Loading in Digester, lbs VSS/1,000 cf of tank/day	24
Volatile Solids Reduction in Digester, %	35%
Solids Wasted from Digester, lbs/day	200
Mass Solids Yield in Process & Digester per Mass Influent BOD_5, %	60%
Volume Wasted from Digester, gallons/day	1,596
Digester Sludge Age, days	**39**
Air Required for Stabilization, scfm	88
Air Required for Mixing @ 30 cfm/1000 cf	248

Aero-Mod, Inc.

AERATION DESIGN CALCULATIONS

Project: Manistee County, MI ***Date:*** 16-Mar-19
Engineer: Wade Trim ***Units:*** English
Diffuser Type Used: Tubular EPDM Fine Bubble

	Design	Peak		Design	Peak
Q, MGD	0.180	0.180	TKN_o, mg/l	43.8	54.7
BOD_o, mg/l	240	300	$TKN_{assimilation}$, mg/l	11.5	11.5
BOD_{rem}, mg/l	240	300	TKN_{rem}, mg/l	43.8	54.7
BOD_{rem}, lb/day	360	450	TKN_{rem}, lb/day	65.7	82.1
O_2 Requirement, lb O_2/lb BOD_{rem}	1.500		O_2 Requirement, lb O_2/lb TKN_{rem}	4.60	

AERATION REQUIREMENTS - FIRST STAGE

	Design	Peak
Removal in First Stage	65%	72.0%
BOD_{oxy} - Oxygen Required for BOD [Q * BOD_{rem} * 8.34 * O_2 Req. / 24], lbs O_2/hr	14.6	20.3
TKN_{oxy} - Oxygen Required for TKN [Q * TKN_{rem} * 8.34 * O_2 Req. / 24], lbs O_2/hr	8.2	11.3
Actual Oxygenation Rate (AOR), lbs O_2/hr	**22.8**	**31.6**
Standard Oxygenation Rate (SOR), lbs O_2/hr	**60.2**	**83.3**

SOR = [(AOR * $C_{s,20}$) / (α * $\Theta^{A(T-20)}$ * (Tau * Ω * β * $C_{s,20}$ - C_L) * F)]

Where:						
$C_{s,T,H}$	Actual Value of D.O. Saturation, mg/l	**9.08**	C_L	Residual D.O. Conc., mg/l	**2.0**
$C_{s,20}$	Steady State Value of D.O. Saturation, mg/l	9.08	**T**	Temperature of Water, °C	**20**
Tau	Oxygen Saturation Value ($C_{s,T,H}/C_{s,20}$)	1.000	**F**	Diffuser Fouling Factor	0.90
α	Alpha - Oxygen Transfer Correction Factor for Waste	0.60	Θ	Theta - Oxygen Transfer Coeff	1.024
β	Beta - Salinity-Surface Tension Correction Factor	0.95		Site Elevation, FASL	**800**
P_H	Atmospheric Pressure at Site Elevation, psi	14.28	Ω	Omega (P_H/P_s)	0.971

Air Requirement = [SOR / (Oxygen Density * TE% * Diffuser Depth) / 60], scfm **220** **305**

Where:				
Oxygen Density, lbs O_2/cf	0.0175	Diffuser Depth Below Water Surface, ft	**13.0**
Transfer Efficiency per Foot of Submergence, %	**2.00%**		

Denitrification Credit = [Air Rqmt * (TKN_{oxy} / AOR) * 50% * ((TKN_o - TN_e) / TKN_o)], scfm 35 50

Where: TN_e = TKN_o / 2 (assumed when D.O. control is not used)

Total Aeration Required in Aeration Basin, scfm **185** **255**

Air Correction

icfm = scfm / [((T_{std} + 460) / (T_{air} + 460)) * ((P_H - (RH% * SVP_{Tair})) / (14.7 - ($RH\%_{std}$ * SVP_{std}))) * ((P_A / P_H)]

Where:					
T_{std}, °F	68	T_{air}	Maximum Air Temperature, °F	**104**
$RH\%_{std}$	36%	RH%	Maximum Relative Humidity, %	**90%**
SVP_{std}, psi	0.34	SVP_{Tair}	Saturated Vapor Pressure of Air @ T_{air}, psi	1.058
		P_A	Actual Atmospheric Pressure after Blower Inlet, psi	14.08

Minimum Air Required for Mixing in First Stage Aeration Basin, cfm	126	Side Roll
Minimum Air Required for Mixing in Second & Third Stage Aeration Basin, cfm	118	Side Roll
Minimum Air Required for Operating Full Plant, cfm (mixing requirement for 24 hrs)	380	

	Design	Peak	Design	Peak
Aeration Pressure, in. H_2O			198	198
psi, std (does not include blower inlet/outlet)			**7.1**	**7.1**

		scfm	scfm	icfm	icfm
Aeration Basin - Fine Bubble		185	255	220	303
Aeration Basin - Coarse Bubble		171	171	202	202
Aerobic Digester Tank	(sequenced aeration)	124	124	124	124
Bio-P / Selector Tank		17	17	17	17
Clarifier RAS Airlift Pumps & Skimmers		37	37	37	37
	Total Air Required	534	604	599	683
	Total Air Available			**723**	**807**

POWER REQUIREMENTS

	Unit	Power	Power
Operating Power for Aeration Basin, HP	Blower	18.3	20.7
Operating Power for Digester, HP	Blower	5.4	5.1
Operating Power for Bio-P Fermentation Zone, HP	Blower	0.7	0.7
Operating Power for Clarifier, HP	Blower	1.6	1.5
Operating Power for Anaer. Selector Zone, HP	Mixer	1.0	1.0
Operating Power for Pneumatic System, HP	Air Compr.	0.4	0.4
Operating Power Required at Full Loading, HP		**27.4**	**29.4**
Minimum Power Required to Operate Full Plant , HP		**17.4**	

Aero-Mod, Inc.

AERATION DESIGN CALCULATIONS

Project: Manistee County, MI ***Date:*** 16-Mar-19
Engineer: Wade Trim ***Units:*** English
Diffuser Type Used: Stainless Steel Coarse Bubble

AERATION REQUIREMENTS - SECOND & THIRD STAGE	**Design**	**Peak**
Removal in Second Stage	35%	28.0%
Oxygen Required for BOD [Q * BOD_{rem} * 8.34 * O_2 Req. / 24], lbs O_2/hr	7.9	7.9
Oxygen Required for TKN [Q * TKN_{rem} * 8.34 * O_2 Req. / 24], lbs O_2/hr	4.4	4.4
Actual Oxygenation Rate (AOR), lbs O_2/hr	**12.3**	**12.3**
Standard Oxygenation Rate (SOR), lbs O_2/hr	**23.3**	**23.3**

SOR = [(AOR * $C_{s,20}$) / (α * $\Theta^{\wedge(T-20)}$ * (Tau * Ω * β * $C_{s,20}$ - C_L) * F)]

Where:						
	$C_{s,T,H}$	Actual Value of D.O. Saturation, mg/l	9.08	**C_L**	Residual D.O. Conc, mg/l	**2.0**
	$C_{s,20}$	Steady State Value of D.O. Saturation, mg/l	9.08	**T**	Temperature of Water, °C	20
	Tau	Oxygen Saturation Value ($C_{s,T,H}/C_{s,20}$)	1.000	**F**	Diffuser Fouling Factor	1.00
	α	Alpha - Oxygen Transfer Correction Factor for Waste	0.75	Θ	Theta - Oxygen Transfer Coeffi	1.024
	β	Beta - Salinity-Surface Tension Correction Factor	0.95		Site Elevation, FASL	**800**
	P_H	Atmospheric Pressure at Site Elevation, psi/FASL	14.28	Ω	Omega (P_H/P_s)	0.971

Air Requirement = [SOR / (Oxygen Density * TE% * Diffuser Depth) / 60], scfm	**194**	**194**

Where:				
	Oxygen Density, lbs O_2/cf	0.0175	Diffuser Depth Below Water Surface, ft	**13.5**
	Transfer Efficiency per Foot of Submergence, %	**0.85%**		

Denitrification Credit = [Air Rqmt * (TKN_{oxy} / AOR) * 50% * ((TKN_o - TN_e) / TKN_o)], scfm	23	23

Where: TN_e = TKN_o / 2 (assumed when D.O. control is not used)

Total Aeration Required in Aeration Basin, scfm	**171**	**171**

Air Correction

icfm = scfm / [((T_{std} + 460) / (T_{air} + 460)) * ((P_H - (RH% * SVP_{Tair})) / (14.7 - ($RH\%_{std}$ * SVP_{std}))) * ((P_A / P_H)]

Where:						
	T_{std}, °F	68	T_{air}	Maximum Air Temperature, °F	**104**	
	$RH\%_{std}$	36%	RH%	Maximum Relative Humidity, %	**90%**	
	SVP_{std}, psi	0.34	SVP_{Tair}	Saturated Vapor Pressure of Air @ T_{air}, psi	1.058	
			P_A	Actual Atmospheric Pressure after Blower Inlet, psi	14.08	

Minimum Air Required for Mixing in Second & Third Stage Aeration Basin, cfm	118	Side Roll
Aeration Pressure, in. H_2O	189	189
psi, std (does not include blower inlet/outlet)	**6.8**	**6.8**

	Design scfm	**Peak** scfm	**Design** icfm	**Peak** icfm
Aeration Basin - Coarse Bubble	171	171	202	202

Aero-Mod, Inc.

CLARIFIER DESIGN CALCULATIONS

Project: Manistee County, MI
Engineer: Wade Trim
Clarifier Type Used: Split-ClarAtor

Date: 16-Mar-19
Units: English

FLOW CONDITIONS

Design Flow, MGD	0.180	
Peaking Factor, hourly	3.00	0.540 MGD
Duration, min	60	
Peaking Factor, sustained	2.50	0.450 MGD
Aeration Tank Volume, Mgal	0.180	
MLSS, mg/l	3,410	
Avg. RAS Recycle Rate, %	150%	

EQUIPMENT SIZING & SELECTION

Number of Clarifiers	**2**	Surface Area per Clarifier, sf	256
Clarifier Unit Model	**16256**	Total Surface Area, sf	**512**
Bridge Length, ft	16	Total Weir Length, ft	58
Clarifier Unit Width, ft	16	Tank Wall Depth, ft	16.0
Number of Units per Clarifier	1	Tank Water Depth, ft	14.0

SURFACE OVERFLOW RATE

	Design	
Design Flow, gpd/sf	**352**	
Peak Day Flow, gpd/sf	879	
Peak Hour Flow, gpd/sf	1,000	* Max allowed to leave clarifier
Max. Flow Allowed Through Clarifier Orifice, gpd/sf	1,000	* Max allowed to leave clarifier

WEIR OVERFLOW RATE

Design Flow, gpd/lin. ft	**3,103**
Peak Flow, gpd/lin. ft	8,828

SOLIDS LOADING RATE

Design Flow, lbs/day/sf	**25.0**
Peak Flow, lbs/day/sf	43.4

RETENTION TIME - including RAS

Design Flow, hr	**2.9**
Peak Flow, hr	1.6

PEAK FLOW HANDLING - IN-BASIN SURGE STORAGE

Hourly Peak Flow, MGD	0.540	Vol. of In-Basin Surge Storage, gal	7,443
Max. Flow Through Clarifier, MGD	0.512	Capacity of Surge Storage, hr.	6.4
Stored Peak Flow, gpm	19		

Aero-Mod, Inc.

TANKAGE DESIGN CALCULATIONS

Project: Manistee County, MI ***Date:*** 16-Mar-19
Engineer: Wade Trim ***Units:*** English
Tank Construction: Cast-in-Place Concrete

BIO-P / SELECTOR TANK

Fermentation	Volume Required, gal	**10,000**	
Number of Tanks	1	Tank Length, ft	7.0
Tank Wall Height, ft	16.0	Tank Width, ft	17.0
Tank Water Depth, ft	14.0	Total Volume, gallons	**12,462**
Freeboard, ft	2.0	Retention Time, min.	100
Anaerobic Selector	Volume Required, gal	**11,250**	
Number of Tanks	1	Tank Length, ft	8.0
Tank Wall Height, ft	16.0	Tank Width, ft	17.0
Tank Water Depth, ft	14.0	Total Volume, gallons	**14,242**
Freeboard, ft	2.0	Retention Time (Design + RAS), min.	46

AERATION TANK Volume Selected, gal **180,000**

Tank Wall Height, ft	16.0	Number of Trains	2
Tank Water Depth, ft	14.0	Number of Stages	2

Stage 1		*Stage 2*	
Number of Tanks	2	Number of Tanks	2
Tank Length, ft	18.0	Tank Length, ft	35.0
Tank Width, ft	25.0	Tank Width, ft	12.0
Area of Each Tank, sf	450	Area of Each Tank, sf	420
Total Volume, gallons	**94,248**	Total Volume, gallons	**87,965**

Total volume provided, gal **182,213**

CLARIFIER TANK

Number of Tanks	2	Tank Length, ft	16.0
Tank Wall Height, ft	16.0	Tank Width, ft	16.0
Tank Water Depth, ft	14.0	Total Volume, gallons	**53,617**

AEROBIC DIGESTER TANK Volume Selected, gal **61,740**

Number of Tanks	2	Tank Length, ft	38.0
Tank Wall Height, ft	16.0	Tank Width, ft	8.0
Tank Water Depth, ft	14.5	Total Volume, gallons	**65,944**

OVERALL TANKAGE DIMENSIONS

Total Length, ft	46.0	Wall Thickness, in	12.0
Total Width, ft	79.0	Floor Thickness, in	18.0
Total Area, sf	3,634	Total Concrete for Walls, cy	**308**
Total Wall Length, LF	519	Total Concrete for Slab, cy	**216**
		Total Grout for Clarifier, cy	**24**

Aero-Mod, Inc.

EQUIPMENT AND SERVICES COST ESTIMATE

Project:	Manistee County, MI	***Date:***	16-Mar-19
Engineer:	Wade Trim	***Units:***	English

EQUIPMENT SUPPLIED

AERATION EQUIPMENT

3	Aeration pd blower/sound enclosure package, 25 HP - 460 V, 3 ph	
3	Blower inlet weatherhood	
2	SEQUOX aeration control butterfly valve, pneumatically-actuated	
2	SEQUOX aeration throttling butterfly valve, gear-operated	
2	SEQUOX aeration control butterfly valve, pneumatically-actuated	
2	SEQUOX aeration control butterfly valve, electrically-actuated	
2	Aeration flow conditioner/flow sensor/SS flanged pipe spool	
2	Aeration throttling butterfly valve, gear-operated	
10	Wall mounted aeration assembly, Model WA-PF6-2	- First Stage Aeration Basins
10	Wall mounted aeration assembly, Model WA-HS2-2	- Second Stage Aeration Basins

BIO-P EQUIPMENT

1	Aeration control butterfly valve, pneumatically-actuated	
1	Aeration throttling butterfly valve, gear-operated	
3	Wall mounted aeration assembly, Model WAD-HSS2	
1	Bio-P Submersible Mixer - ___ HP - 230/460 V, 3 ph	- Anaerobic Selector Zone

CLARIFIER & RAS EQUIPMENT

2	Aero-Mod Split-ClarAtor Clarifier System - 256 sf/each	
2	Algae Control Transducer - 115V	

DIGESTION, SLUDGE HOLDING & WAS EQUIPMENT

2	WAS airlift pump, Model AL-400
2	Aeration control butterfly valve, pneumatically-actuated
2	Aeration control butterfly valve, electrically-actuated
2	Aeration flow conditioner/flow sensor/SS flanged pipe spool
8	Wall mounted aeration assembly, Model WAD-HS2-2

ELECTRICAL & CONTROLS EQUIPMENT

1	SEQUOX Process Control Panel w/ Allen Bradley PLC, Model SQC-200 Series - 115 V
3	Blower control panel w/ Allen Bradley 6-pulse VFD - 460 V, 3 ph
2	Air compressor, 2.0 HP with 80 gal tank - 460 V, 3 ph
2	Air compressor auto-drain - 115 V wall outlet
1	PureGas regenerative desiccant dryer mounted on 80 gal dry storage tank - 115 V wall outlet
1	D.O. Control System - probe analyzer w/ 4 rail-mounted DO probes

ANCILLARY EQUIPMENT

230	Wall mounted walkway & handrail, LF
4	Wall mounted stop plates & frames
LS	Spare Parts
LS	Interior tank installation materials - SS brackets, SS bolts, PVC wall inserts, pneumatic tubing, misc.

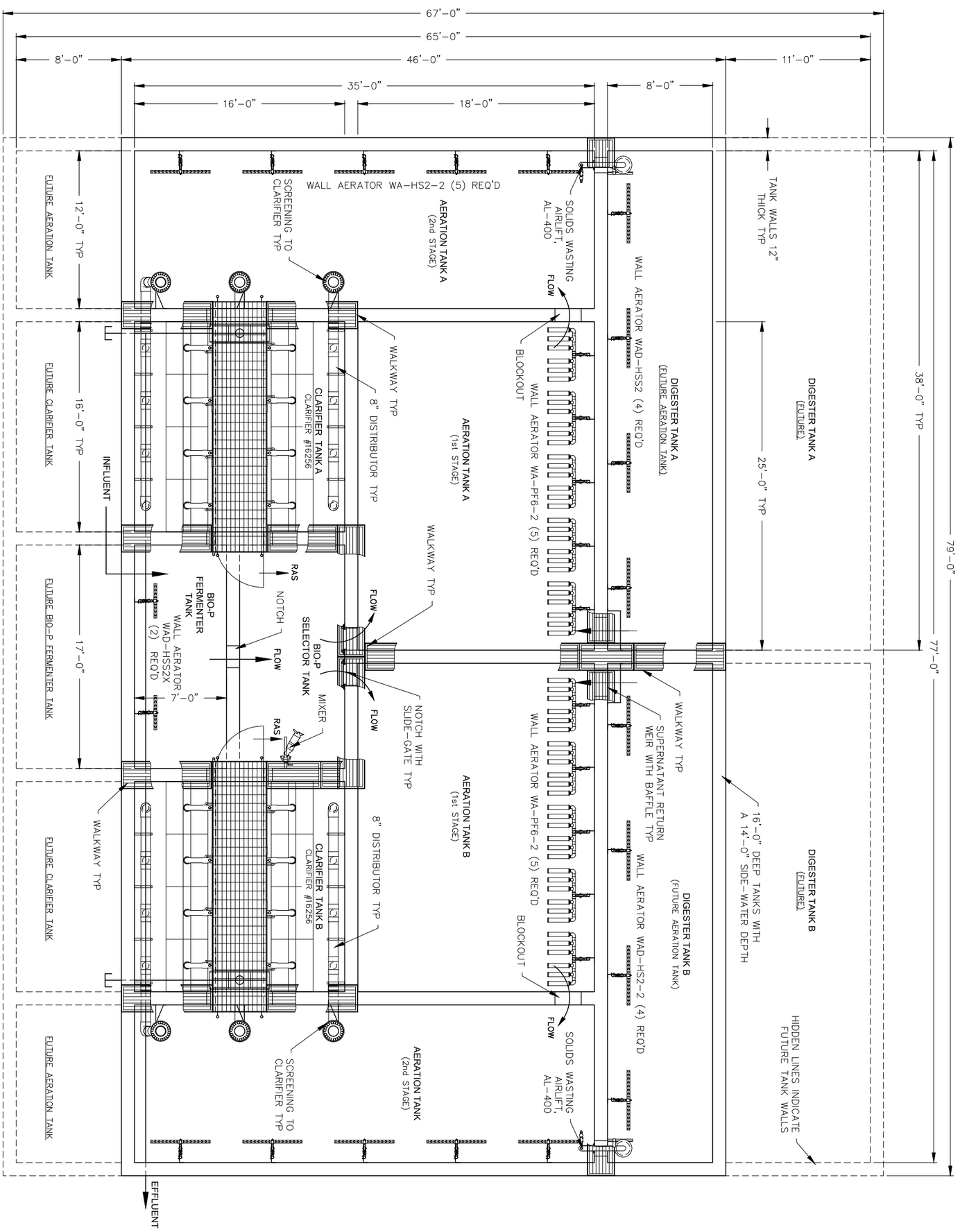
SERVICES

LS	Freight to jobsite
LS	Aero-Mod equipment dry inspection/equipment start-up & training, two (2) days
LS	Aero-Mod biological training, two (2) days
LS	Operator training school - 2 days at Aero-Mod facilities in Manhattan, KS

TOTAL EQUIPMENT COST	**$582,900**
EST'D INSTALLATION of Aero-Mod EQUIPMENT by Contractor *(Includes Interior Tank PVC Piping)*	$100,000
ESTIMATED CONCRETE TANK COST by Contractor	$410,000
Concrete for Tank Walls, cy: 308	
Installed Concrete Cost, $/cy: $800	
Concrete for Tank Slab, cy: 216	
Installed Concrete Cost, $/cy: $700	
Grout for Clarifier Bottom, cy: 24	
Installed Concrete Cost, $/cy: $550	
ESTIMATED COST	**$1,092,900**

PLEASE NOTE THE FOLLOWING

1. Buildings, site work, and auxiliary equipment are not included within this estimate.
2. No RAS pump station and associated electrical requirements are required.
3. Yard piping is not required between each Aero-Mod tank.
4. All associated walkways & handrail for the clarifier and tankage are included in the above estimate.
5. This estimate is valid for 90 days from the above date.



Aero - Mod, Inc.

7927 U.S. Highway 24
Manhattan, Kansas 66502

PHONE: (785) 537-4995
FAX : (785) 537-0813

Drawn by:	Chk by:	Scale:	Date:
MA		NTS	03/14/19

Title:

PLAN VIEW
PHASE I - 0.18 MGD
MANISTEE COUNTY, MI

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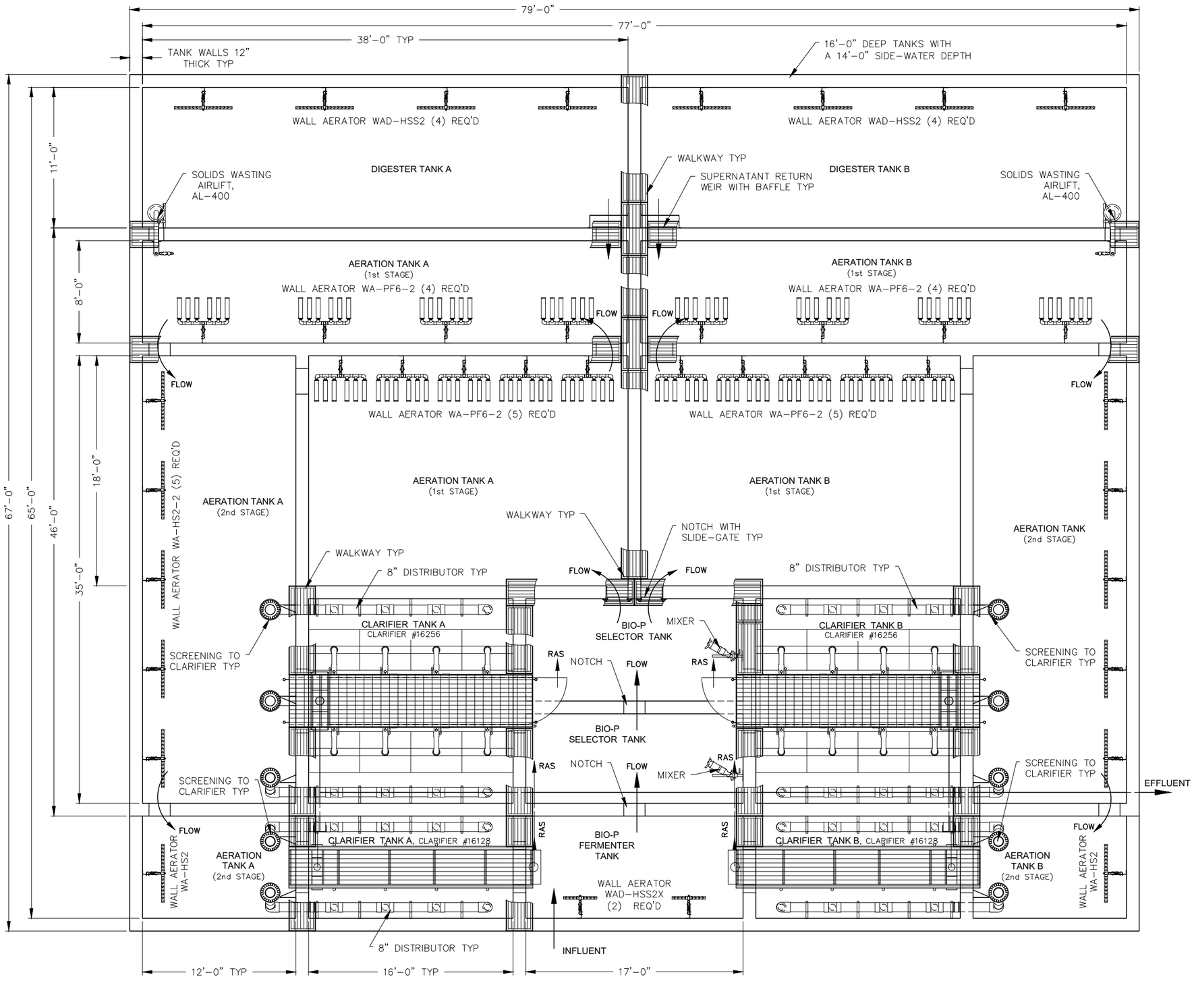

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Chk by:
Scale: NTS
Date: 03/14/19
Title:

PLAN VIEW
PHASE II - 0.26 MGD
MANISTEE COUNTY, MI

Aero - Mod, Inc.

7927 U.S. Highway 24
Manhattan, Kansas 66502

PHONE: (785) 537-4995
FAX: (785) 537-0813

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