Grand Traverse County Septage Treatment Facility Financial and Operations Analysis

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EXECUTIVE SUMMARY

The Grand Traverse County Septage Treatment Facility (STF) was designed to treat septage, holding tank waste and grease. The residents of Grand Traverse County needed the facility to eliminate the problems associated with land application of septage waste. Issues with land application included frozen soil conditions and loss of land disposal sites due to public pressure and residential development. Disposal of septage, grease and holding tank waste at the STF reduces the public health risk from pathogens and nutrient contamination of ground and surface water resources.

The STF is a state-of-the-science treatment facility that utilizes a membrane bioreactor (MBR), to produce liquid effluent that is discharged to the regional wastewater treatment plant. Solids are handled by an Autothermal Thermophilic Aerobic Digester (ATAD) which reduces solids volume by 70%. Ultimately, the STF will produce Class A Biosolids suitable for land application without restrictions.

Plante and Moran and URS Corporation were contracted to assess the financial and operational aspects and to develop a marketing/ education plan for the STF. To accomplish this task our team:

- Reviewed existing educational and marketing material for the STF
- Reviewed plant financial data;
- Developed a financial modeling tool (included with this report);
- Toured the plant and met with the operators;
- Reviewed design plans and documents, and;
- Assessed potential waste sources, traditional and special, within the region.

Our financial analysis identified that multiple revenue sources would need to be increased or developed to meet the financial requirements of the STF. No single source, such as, volume, rate increases or special waste was likely to provide the revenue required to meet the STF's long term expenses.

Our engineering and operations analysis identified several areas of efficiencies that could reduce the STF's annual operating expenses. Electric and personnel expenses are areas with the greatest likelihood of savings. Electrical savings of approximately $30,000 per year may be realized by adding greater control to the flux across the MBR. Personnel savings of up to $75,000 per year could be realized by reducing staffing and increasing automation at the plant. Substantially greater savings could also be realized long-term by constructing the future wastewater treatment plant adjacent to the STF.

In the near term financial sustainability can be achieved by implementing the following actions:

1. Increase permit fee for new septage or holding tank systems from $150 to $1,000.
2. Implement opportunities for operations savings identified within this report related to power ($30,000) and staffing ($75,000) beginning in 2009. For our analysis, subsequent to 2009 these savings are indexed by the applicable assumed increases.
3. Replace the user rate charge for septage/grease disposal service with a special assessment. The $0.12 rate per gallon is no longer charged for septic tank owners within Grand Traverse County. Instead, a special assessment is placed on all (approximately 23,000) septage/grease tanks in the County.

4. Allow users outside of Grand Traverse County, but within the 25 mile service area, to dispose of septage, grease and holding tank waste for $0.12 per gallon.

Under these conditions operations are been funded and the target working capital and reserves balance of approximately $1.5 million has been established by the end of 2014. This scenario results in operational savings of over $700,000 through 2014.

In lieu of the $0.12 per gallon disposal fee septic/grease tank owners will be required to pay an annual assessment on their tank. Per discussion with the County the STF is allowed to assess for operations and items related to capital improvements. Assuming all of the components related to the target working capital and reserves qualify, the annual assessment would range from $25 in 2010 to $28 in 2014, and would be $32 in 2009 because no waste from outside the County can be accepted until 2010. The annual average cost to a tank owner assuming a pumping fee of $200 and a pumping cycle of 5 years ranges from $65 in 2010 to $68 in 2014. This amount is significantly less than the annual average sewer charge for households using the regional treatment plant. This scenario forecasts that a required contribution by the stakeholder communities will not be necessary through 2014 if estimates for septage, grease and holding tank volumes from outside the County are correct.

1.0 INTRODUCTION

The Grand Traverse County Septage Treatment Facility (STF) opened for business in May, 2005. This innovative facility was designed and constructed through a joint effort of Grand Traverse County and a consortium of townships (i.e., East Bay, Garfield, Elmwood, Acme, Peninsula) to address the growing environmental problem of septage disposal. The facility is designed to accept waste from septic tanks, holding tanks and grease traps.

The original project plan incorporated a user fee system to pay for the facility's operational costs and debt service. Waste volumes, however, have been less than predicted and the facility has operated at a deficit since opening. Consequently, the Grand Traverse County Department of Public Works contracted with the Plante Moran/ URS Corporation Team to perform an "analysis of operations" to identify and evaluate options for attaining long term financial sustainability. Work products, as provided for in the Service Contract, include:

- A short and long term financial forecast addressing the validation of operating costs and potential revenues (including analysis of existing fee structures, debt requirements and refinancing alternatives; and a comparative analysis of homeowner costs for a sewer system vs. septic/ holding tanks);
- An analysis of the current and prospective market potential for the facility (including a focus on facility purpose, Michigan Department of Environmental Quality requirements, and various incentives to volume providers); and
- A report and recommendations for an educational component designed to build trust and credibility in the facility (including identification of potential audiences, delivery methods and recommendations for lead responsibilities).

These work products are addressed in the following report, which characterizes the financial health of the facility; identifies operational efficiencies; evaluates alternatives to achieve financial sustainability; and presents a Marketing and Education Plan to support the recommended alternative. Following this Introduction (Section I), the report is organized as follows:

- **Section II (Background)** describes STF history and purpose, initial financial and operational projections; and current financial and operational issues in need of resolution. Revenue requirements, debt service, operation and maintenance costs, past shortfalls and waste volumes are described as they relate to the facility's overall financial outlook.
- **Section III (Financial and Operational Analysis)** offers an in-depth examination of facility finances and operations, describing revenues, expenses and treatment components. A financial assessment tool developed for the county is presented, along with four scenarios demonstrating how varying financial and operational alternatives will impact overall plant finances. Also addressed are the existing fee structure and a comparative analysis between septic tank owners and homeowners connected to the Grand Traverse Regional sanitary sewer system and wastewater treatment plant.

- **Section IV (Financial and Operational Alternatives)** identifies and evaluates various alternatives with the potential to increase revenue and/ or waste volumes while decreasing operating expenses.
- **Section V (Conclusions and Recommendations)** presents a recommended course of action and associated rationale. Facility financial projections under existing practices are compared with projections associated with the recommendation. Short and long term solutions are provided.
- **Section VI (Marketing and Education)** - This section presents the framework for a Marketing and Education Plan that will build trust and credibility in the STF while advancing the recommended course of action. Multiple target audiences are identified, a marketing "message" is presented, and plan products, delivery methods and timeline are addressed. In addition, a strategy for engaging partner agencies and organizations in STF marketing and education is offered.

2.0 BACKGROUND

Financial and flow data (through June 2008) indicate that the STF is incapable of independent, long term fiscal sustainability at current flow levels and operation within the existing revenue stream system. Current revenue projections are not expected to cover anticipated costs for the next fiscal year, which include an operations budget of approximately $600,000 and a similar figure associated with annual debt service.

Over the short term, volume-based revenues (from holding/ septic tanks and special wastes such as Bay Harbor leachate) could potentially cover the cost of operations under the current rate structure, but may not if special waste revenues decrease. However, they will not cover the cost of debt service. Holding tank flows are not anticipated to increase dramatically and the current rate is unlikely to be competitive if increased. Septage flow is significantly below levels originally projected during STF design, despite an increase in flow projected for 2008 (Table 2.1). The treatment rate has been set at $0.12 per gallon. Looking to the future, it is unlikely that these revenue streams can continue to support operations without a significant increase in flow, increased rates and/or the addition of other revenue streams.

Table 2.1 Initial waste volume estimates and actual waste volumes received at STF.

Waste Type	Design Estimates gal/ year	2007 Volumes gal/ year	2008 Volumes (projected) gal/ year
Septage	7,029,049	3,008,839	4,086,162
Holding Tank	3,606,132	2,583,443	2,918,817
Grease[1]	412,550	217,850	546,995
Total	**11,047,731**	**5,810,132**	**7,551,974**

[1] *Grease accepted beginning August 2007.*

As noted in the Introduction, septage and holding tank waste volumes at the facility have been significantly less than predicted. Possible explanations (admittedly speculative) consist of factors that could individually or collectively affect the volume of waste. For example, the increase in pumping costs resulted in a decrease in demand for pumping. This is supported anecdotally by haulers in Grand Traverse County. Also, septic tank owners have temporarily delayed pumping due to the price increase. The steady increase in volume through 2008 may support this concept.

Special waste revenues presently comprise a significant portion of overall STF revenue. Unfortunately, special waste now being accepted at the STF is not anticipated to be available on a long term, reliable basis. Present revenue from special waste does not entirely cover the cost of debt service, and there are no other significant revenue sources contributing to the system.

Less than anticipated septage flow, coupled with the need to keep rates competitive, has prevented the STF from attaining long term financial sustainability. This is evidenced by the fact

that no reserves currently exist for working capital, planned replacement, emergency replacement or debt service. The plant has maintained operations each year by borrowing from the County and paying it back using revenue generated the following year. As of December 31, 2008 the facility will owe $300,000 to the County.

3.0 FINANCIAL AND OPERATIONS ANALYSIS

A financial and operational analysis was completed for the STF, supported by the development and application of a financial forecasting tool. Different operating scenarios can be quickly analyzed by the tool, which features an MS Excel- based spreadsheet that is flexible and easy to understand and use.

Our operational analysis included a review of STF unit processes and an evaluation of operational efficiency.

The following sections describe the results of the analysis.

3.1 FINANCIAL ANALYSIS

A financial forecasting tool was developed and applied to enable the County to analyze various hypothetical scenarios related to the facility. Primary potential variables under these scenarios include flow volume; rates and rate structure; alternative revenue; and debt structure.

The tool provides support and validation of required revenue. For each scenario, the model has the capability to present the various components of resulting rates (per unit) including cost of treatment; debt service; capital improvements; and accumulation and maintenance of reserves. The tool also calculates the average annual cost to a septic tank customer (as described under the assumptions section later in the report).

The forecasting tool was developed in a “user-friendly” format that will allow the County to employ it in the future to devise workable solutions to any financial issues that may emerge. The model is presently designed to forecast for a five year period, but can easily be modified to accommodate a much longer timeframe.

3.1.1 Approach Used Within the Tool

If the STF is to attain financial sustainability, revenues will be needed to yield cash flow that both funds operations via net income, and covers the requisite cash flow for the principal and interest components of debt service. In addition, revenues should be at a level to establish and maintain reserves. At current operating levels and flow, annual operating costs are approximately $600,000 and total annual debt service required is at approximately the same level. Currently, no reserves exist.

Our financial forecasting model tracks the working capital and level of reserves within the system for a given fiscal year. A target “working capital and reserves” (WC&R) amount is established by setting assumptions for a given scenario. The model then calculates, on an annual basis, cumulative surplus or shortfall of cash compared to the target level.

The user rate for septage, grease or holding tank waste applied under a given scenario can be easily changed to reflect a percent increase (or potential decrease) compared to the existing or

prior year rate. The effect of the incremental change on surplus/shortfall is calculated to determine if the increase/decrease is adequate to meet the target WC&R balance.

The model has been set up to "smooth" proposed rate changes over the first five years of implementation. This approach yields consistent annual percentage rate increases, with a goal to achieve the target WC&R balance at the end of the five year period.

Annual revenue required by the user rate is calculated on the basis of the WC&R balance at the beginning of the year, less annual costs to be incurred by the system, net other anticipated revenues. Costs to be incurred include the operating expenses of the system and the debt service.

The tool forecasts costs on the level of the general ledger accounts. Other anticipated revenues include holding tank treatment fees, permit fees and special waste treatment fees, among others.

Once the required revenue is generated from user fees from septic and holding tanks, it is applied against the projected units of flow. Our model then calculates the surplus/shortfall generated, on an annual basis, compared to the target WC&R balance. The model also articulates the surplus/shortfall of working capital excluding target reserves. This is important because any resulting shortfall (excluding reserves) represents monies that must be borrowed from outside of the system to maintain operations and meet debt service requirements.

3.1.2 Assumptions

A set of assumptions was generated and consistently applied to all evaluated scenarios. These assumptions can be easily altered or tailored within the model. The County may wish to review and modify these assumptions, as conditions change, to maximize the model's effectiveness. Key assumptions presently reflected in the model are as follows:

- As of December 31, 2008 working capital is expected to be $0.
- Smoothed annual increases to expenses relate to chemicals (3%), biosolids (4%), sewer system disposal fee (3%), health care costs (7%) and utilities (10%).
- Reserves equal to 90 days of operating and debt service.
- The interest rate on the existing debt is 5.5% and the term is 20 years.
- A 10% increase in volume in 2010 due to the increase in service area.
- Average holding tank volume is 3,000 gallons and pumped seven times a year.
- Average septic tank volume is 1,200 gallons and pumped once every five years.
- Holding tank revenue will remain constant over the next five years. Given the small per unit charge related to holding tank waste, even significant changes in volume (which are not anticipated) will yield only minimal revenue increases.

- Bay Harbor special waste treatment is expected to yield $500,000 in revenues per year through December 2012.
- Permit fees will remain constant over the next five years.
- Funds currently borrowed from the County (approx $300,000) will be paid back over a four year period beginning in 2009.
- $100,000 in capital improvements will be required each year beginning in 2010.

Four reserve components were incorporated into our model, and include reserves for:

- **Planned replacement of existing infrastructure and equipment.** This will help to avoid costly financing fees in the future. Currently, the annual amount to be set aside is calculated based on anticipated depreciation.
- **Capital Improvements Program for the subsequent year.** At the end of a given fiscal year, funds will be on hand to address planned capital improvements for the following year. A minimal amount of capital improvements is currently included in the model.
- **Operating cash flow** – Ninety days of annual operating expenses (and debt service) have been included in the reserves to provide for "float time" between expenses being incurred and related revenues received.
- **Emergency replacement** – This component provides ready access to funds for immediate repair or replacement of critical facility components due to unforeseen equipment failure.

The current rate structure was not established using this approach. Our model therefore assumes that reserves will not achieve target levels until the end of the first five years of implementation. This will help avoid drastic initial rate increases while smoothing the related rate increase over time.

3.2 SCENARIOS

Four hypothetical scenarios were developed using the model to frame the overall issues and show the impact of changing operational inputs. These scenarios define the parameters of the financial issues and potential solutions and revenue structures. The purpose of these hypothetical scenarios is not to provide specific options, but to demonstrate that revenue needs to be increased using several mechanisms. Changes in any of the assumptions will alter results of the analysis of each of the scenarios as they currently exist in the model. As noted earlier, the County may alter the above assumptions in the future to maximize the relevance of the model to changing conditions.

Preliminary results associated with the following four scenarios are not intended to serve as financial statements, and we do not express an opinion on them.

Scenario One – Forecast cumulative surplus/shortfall in working capital, considering no change in current rates and no change in current anticipated flow over the next five years.

Scenario Two – Calculate the septage user rate required to meet the target WC&R, based on current levels of anticipated flow within five years.

Scenario Three – Calculate the septage flow required to meet the target WC&R, based on existing rates within five years.

Scenario Four – Provide an example of an increase in both rates and flow to meet the target WC&R within five years.

Presented below is a detailed review of scenario- specific assumptions, smoothed annual cost to the average user, and the financial results for each of the above scenarios.

In all cases, the following assumptions are made:

- The cost charged to pump a tank from the septage hauler is $200
- The average units pumped are 1,200 gallons
- Tanks are pumped every five years

3.2.1 Scenario One

Forecast cumulative surplus/shortfall in working capital, considering no change in current rates and no change in current anticipated flow over the next five years.

Scenario-Specific Assumptions
This scenario assumes the user fee charged to septic customers will remain constant at $0.12 per gallon over the next five years. It also assumes that volumes in 2009 will be approximately 4.5 million units and will increase by 10 percent in 2010 (to 5.0 million) and will remain at that level in subsequent years.

Smoothed Annual Cost to Average User
The resulting cost of treatment is $144. Combined with the $200 cost to pump equates to a total cost of $344. Spread over a five year pumping cycle, this equates to approximately $68 per year. This average cost is the same for each of the five years in the model given that the user rate is assumed to remain constant at $0.12 per gallon.

Financial Results
This scenario maintains the user charge at a low rate. However, based upon stated assumptions, it is not a viable alternative for the STF. By December 2014 the system would be required to borrow almost $2.4 million to sustain operations. In addition, no reserves will have been established and the target level of approximately $1.5 million for working capital and reserves (as of December 2014) will not exist.

Annual revenues generated by septage treatment are approximately $544,000 to $600,000. From 2009 through 2014, annual operating costs (excluding the cost of debt service) range from $600,000 to $805,000. Annual debt service costs range between $575,000 (year 2010) and $616,000 (year 2013), equating to approximately $0.12 per gallon at assumed flow volumes.

The model predicts annual shortfalls (exclusive of reserve shortfalls) in working capital in a range of $160,000 (year 2010) to $750,000 (year 2013). These shortfalls represent funds that would need to be borrowed from outside the system to allow operations to continue.

3.2.2 Scenario Two

Calculate the septage user rate required to allow the system to meet the target WC&R, based on current levels of anticipated flow within five years.

Scenario-Specific Assumptions
This scenario assumes the user fee charged to septic customers will be increased over the next five years from $0.12 per gallon to the level required to attain long term financial sustainability. This is based on septage volumes in 2009 of approximately 4.5 million units and volumes of 5.0 million for the remainder of the five year period. The annual percent increase will be smoothed to provide for the same percent increase each year. This scenario calculates the user rate required to meet the financial sustainability objective.

Smoothed Annual Cost to Average User
The resultant treatment cost increases each year due to the annual increase in the user fee, which adjusts from the present level of $0.12 per gallon to $0.45 in 2014. This translates into annual septic tank treatment costs that increase from $144 to $535 over the five year period. Combined with the $200 cost to pump, the total cost to the customer under this scenario increases from $344 to $895 over the five year period. Spread over a five year pumping cycle, total costs increase from $68 to $179 per year. (see Table 3-1).

Table 3-1 Change in treatment costs with price changes for 2009 through 2014 under scenario 2.

Annual Cost to Treat a Septic Tank	Year Ended Dec, 2009	2010	2011	2012	2013	2014
Cost to treat a septage tank (gals)	$144	$187	$243	$316	$411	$535
Annual cost spread over pumping cycle (yrs)	$69	$77	$89	$103	$122	$147

Financial Results
Based upon stated assumptions, this approach requires a 30 percent annual increase in user rates through 2014 to attain financial sustainability to a level that is almost four times higher

than the current rate. As of December 2009, the STF would need to borrow an additional $300,000 to maintain operations. The target WC&R would be achieved by December 2014 and borrowed funds will have been repaid.

An annual septic tank maintenance cost of $147 is significantly less than existing sewer charges in the local area, as detailed later in this report. However, a $0.45 per gallon rate is not competitive with other septage treatment facilities in the area and, under this scenario; a significant reduction in current volumes is anticipated.

3.2.3 Scenario Three

Calculate the septage/grease flow required to allow the system to meet the target WC&R, based on existing rates within five years.

Scenario-Specific Assumptions
This scenario assumes the user fee charged to septic/grease customers will remain constant at $0.12 per gallon over the next five years. To achieve fiscal sustainability, additional septage/grease flow in excess of the assumed projected levels (approximately 4.5 million gallons in 2009 and 5.0 million for the remainder of the five year period) will need to be secured. This scenario calculates the requisite increase in flow.

Smoothed Annual Cost to Average User
The resulting cost of treatment is $144. Combined with the $200 cost to pump equates to a total cost of $344. Spread over a five year pumping cycle, this equates to approximately $68 per year. This average cost is the same for each of the five years in the model given that the user rate is assumed to remain constant at $0.12 per gallon.

Financial Results
Based upon stated assumptions, this approach requires that 16 million gallons of septage/grease would need to be treated on an annual basis, beginning in 2010, to meet financial sustainability objectives. This represents an annual volume increase of approximately 11.5 million units, or about three and a half times the volume currently anticipated for the five year period.

Our research, as well as discussions with the County, has determined that obtaining flow at this level is not a realistic expectation.

3.2.4 Scenario Four

Provide an example of an increase in both rates and flow to allow the system to meet the target WC&R within five years.

Scenario-Specific Assumptions
This scenario assumes the user fee charged to septic/grease customers will be increased from $0.12 per gallon at a 9 percent rate over the next five years. This will be combined with an

increase in volume to collectively allow the STF to attain long term financial sustainability. This scenario calculates the volume required based on the increased user rate.

Smoothed Annual Cost to Average User
Treatment cost increases each year due to the annual adjustment in the user fee which increases from $0.12 per gallon to $0.185 in 2014. This results in an annual increase from $144 to $222. Combined with the $200 cost to pump, the total cost to the customer under this scenario increases from $344 to $444. Spread over a five year pumping cycle, the cost increases from $68 to $84 per year. See Table 3-2.

Table 3-2 Change in treatment costs with price changes for 2009 through 2014 under scenario 4.

Annual Cost to Treat a Septic Tank	Year Ended Dec, 2009	2010	2011	2012	2013	2014
Cost to treat a septage tank (gals)	$144	$157	$171	$186	$203	$222
Annual cost spread over pumping cycle (yrs)	$69	$71	$74	$77	$81	$84

Financial Results
Based upon stated assumptions, this approach requires that the user rate would have to increase 54% over the current rate through 2014. In addition, the STF would need to treat 11.0 million gallons of septage beginning in 2010. This represents an annual volume increase of approximately 6.5 million gallons, or almost two and a half times the volume currently anticipated.

The annual septic tank maintenance cost of $84 is significantly less than existing sewer charges in the area, as detailed later in report. However, a $0.185 per gallon rate is not competitive with other septage treatment facilities in the area and, under this scenario, a significant reduction in current volumes is anticipated. In addition, our research and analysis suggests that obtaining a flow of 11.0 million gallons is not a realistic expectation. A conservative estimate for septage volumes (beginning in 2010) is 7.5 million gallons. Increases in subsequent years will be dependent, in part, on population increases projected to be 11% per decade (NWMCOG, 2008).

3.3 SEPTAGE TREATMENT COSTS COMPARED TO SEWER SERVICE

Septage treatment continues to be a cost effective alternative to sewer treatment. Under all the above scenarios, septage treatment costs are significantly less than sewer service costs in the local area. The annual cost to an average septic tank owner was computed based on the

assumptions applied to the four scenarios:

- The cost charged to pump a tank is $200
- The average units pumped are 1,200 gallons
- Tanks are pumped every 5 years

Annual treatment costs range from $68 to $147 depending on the scenario. Annual "ready to serve" charges for sewer service in the local area average $276 shown in Table 3-3.

Table 3-3 Annual average household charge for communities participating in the regional wastewater system.

Community	Annual Ready to Serve Charge (2008)
Acme	$300
Blair	$308
East Bay	$210
Elmwood	$336
Garfield	$228
Peninsula	$252
Whitewater	$300
Average	$276

In addition, the one- time cost to convert from a septic system to sewer service is several thousand dollars, including the cost to crush/ remove the existing septic tank and the cost for taping in to the sewer line. Given these costs, it is unlikely that a mass conversion from septic to sewer would take place even under the most extreme rate increases.

3.4 OPERATIONS/ENGINEERING ANALYSIS

The design and operation of the STF was evaluated to determine if cost efficiencies could be realized in the interest of attaining long term financial sustainability for the facility. Our assessment included a review of preliminary design documents, design plans, operational data and interviews with operators.

The STF is a state-of-the-art facility. The Membrane Bio-Reactor (MBR), Autothermal Thermophilic Aerobic Digestion (ATAD) and odor control processes work well. Some issues have arisen related to the facility, but they are fairly common when implementing relatively new technology. The site is well laid out and the buildings have space for expansion. They are well constructed, with sealed concrete floors and block exteriors. All tanks are covered, resulting in minimal to no odors at the facility. The plant operator is knowledgeable about the operation, and was helpful throughout the project. From a treatment process perspective the STF has achieved

its objectives: it treats septage, grease and holding tank waste exceptionally well and is capable of producing Class A Biosolids. Currently, testing of the biosolids is being conducted as part of the process towards achieving Class A designation.

The STF includes the following processes:

- 2 septage screening units
- 1 grease receiving station
- 2 equalization basins with aeration and recirculation pumps
- 1 membrane bioreactor (MBR)
- 2 fine (1 mm) rotary drum screen for preparing the septage to enter the MBR
- 1 auto thermal hemophilic aerobic digester (ATAD) 10,000 pounds/day
- 1 rotary drum biosolids thickener
- 1 light duty belt press

Our interviews with operations and management staff, coupled with our assessment of the facility, identified several issues that are addressed below:

- **Equalization Tank:** The STF Operators reports to the County indicate that grit accumulation in the equalization tank has been a problem, with removal being a challenge. Grit deposits in septage are a common occurrence, although the volume of grit in septage is site- specific. Grit removal facilities are not part of the STF. Regularly scheduled cleaning, preferably with a vacuum truck, should become part of the preventive maintenance schedule. In addition the volume of the equalization tank is less than required in the December 2003 Basis of Design document (appendix A of the design build contract). Basis of Design documents indicate that the required volume for the Primary Equalization Basin is 190,000 gallons. Constructed volume is 126,000 gallons.

- **Membrane Bioreactor (MBR):** The MBR produces a high-quality effluent. The MBR is a Dynatech low pressure MBR. According to the operator and the County, the MBR has not achieved the design permeate flow rate of 90,000 gallons per day (GPD). The design/ build team is currently working on rectifying this limitation by installing additional MBR units.

  The MBR separates solids from liquids via ultra filtration. Mixed liquor is pumped through the membranes. Permeate pumps pull clean water through the membranes. The mixed liquor returns to the aeration tank. The mixed liquor is pumped through the membranes at a rate much higher than the permeate flow to scour the membrane surface and keep it from fouling. The membranes are cleaned with hypochlorite solution or acid periodically to maintain the membrane permeability.

  Flow to the membrane is by airlift pumps. The pumps are powered from the same blowers that aerate the aeration tanks. The aeration tanks have coarse bubble diffusers. Two, 60 horsepower (HP) blowers are on line at any time. The operator reports that, to

maximize the flux across the membranes and maximize permeate capacity, the blowers must be operated at full speed. This airflow maintains the aeration tank Dissolved Oxygen (DO) at up to 8 milligrams per liter (mg/L).

The operator reports that the MBR Operations and Maintenance (O&M) Manual states that the optimal flux rate for one bank of membranes is 600 gallons per minute (GPM). The operator has found that the actual membrane flux rate is less than the optimal rate. The lower than optimal flux rate causes the membranes to foul, reducing capacity and resulting in additional cleaning requirements. The lack of flow capacity means that some flow bypasses the MBR

We examined the MBR unit layout and consulted with a membrane manufacturer. Using a mechanical pump to move mixed liquor past the membranes at the optimal flux rate will take less energy than the current operation. According to the plant operator, a sufficient DO (2 mg/L) can be maintained in the aeration tank at airflow that is approximately 33% of the current operation. In addition, substituting fine bubble diffusers for the coarse bubble diffusers could reduce aeration energy requirement by as much as 50%.

Fine screening of at least three millimeter (mm) is part of most MBR treatment trains. The existing screens appear to work well. The operator has concluded that a washer/compactor is needed to reduce the screenings volume. This is a reasonable solution based upon our experience.

The ATAD is designed for a solids load of 10,000 Lbs/day. Little data on ATAD operation is available, limiting our ability to complete a full mass balance of the unit process. Analyzing the data available provided the following observations:

- Actual loading to the ATAD has averaged approximately 691lbs/day waste activated sludge (WAS) plus the grease loads. This volume is less than 10% of the ATAD design load.
- The reactor is very hot due to pumping grease loads directly to the ATAD.
    - The total solids reduction is very high, perhaps 70% or more.
    - The nitrification/denitrification cycle is very effective.
    - Combined thickened waste activated sludge (TWAS) and grease load averages 8,000 GPD

- **Belt Filter Press Cake Solids:** The County reports that the belt filter press cake is wet (15-17% total solids). The belt press is an OR-Tec one belt press with two nip rollers. This is a light duty, low-pressure press that is usually installed at small treatment plants with aerobic digestion, or in small industrial plants. The cake solids seen at the STF are to be expected from this type of press.

- **Polymer Dose:** The polymer dose reported by the operator is approximately 1.5 gallons of neat polymer per thousand gallons of flow. Assuming a 35% active polymer and two percent feed solids, the active polymer dose is approximately 53 Lbs/dry ton. The primary cause of the high polymer dose is the high temperature in the Simultaneous Nitrification/Denitrification Reactor (SNDR). The SNDR normally is cooled to 95 degrees F for optimizing nitrogen removal. The cycling between the ATAD reactors (hot and high negative oxidation reduction potential (ORP)) and the SNDR (aerobic and cooler) works to reduce biopolymers that interfere with the dewatering polymers. Adding a heat exchanger to reduce the SNDR temperature will reduce polymer consumption. This approach is recommended at a Waste Water Treatment Plant (WWTP) where high volumes of cooled water exist (i.e. the effluent). Adding a heat exchanger could reduce the polymer dose to as low as 10 pounds active polymer per dry ton of solids. This could be achieved at the STF only by adding a source of cold clean water, such as a well or by building the proposed County WWTP at this location. This modification would reduce polymer costs by approximately 80%. For example, if polymer costs are estimated to be $15,000/ year, this modification may drop the polymer expense to approximately $3,000/ year.

3.5 OPERATING EXPENSES

The budget for STF operation and maintenance is $595,907 for the 2008/9 fiscal year. Table 3-4 presents the allocation of funds as a percentage of the total.

Table 3-4 Annual STF operating expenses as a percentage and total value estimated for 2008/9 fiscal year.

Category	Expense ($/ yr)	Percent
Personnel	29,031	4.9%
Commodities	1,522	0.3%
Attorney fees	10,000	1.7%
Dues	258	0.0%
Internet access	3,090	0.5%
Operator - Staff Expenses	150,356	25.2%
Operator - Electricity	149,000	25.0%
Operator - Chemicals	15,000	2.5%
Operator - Operating Expenses	30,523	5.1%
Operator - Outside Services	19,880	3.3%
Operator - Biosolids	20,000	3.4%
Operator - Utilities	10,208	1.7%
Operator - Travel Costs	3,598	0.6%
Operator - Other Expenses	1,400	0.2%
Operator - Insurance	4,349	0.7%
Operator - Education, Training, Meetings	712	0.1%
Contract services - credit card fees	13,225	2.2%
Contract services - disposal of sludge	39,935	6.7%
Contract services - other	12,875	2.2%
Capacity lease	18,540	3.1%
Telephone	1,545	0.3%
Travel	309	0.1%
Conventions & Conferences	1,000	0.2%
Advertising	515	0.1%
Insurance Payments	6,371	1.1%
Utilities - water & sewer	4,950	0.8%
Sewer system disposal exp	44,110	7.4%
Bldg repair & maintenance	3,090	0.5%
Engineering	515	0.1%
Total	595,907	100.0%

As noted, major expenses related to facility operations include:

- Labor – Operations staff, County personnel and attorney fees account for 31.8% of annual operating expense.
- Electricity accounts for 25% of the annual operating expense.

- Utilities (i.e., heat, water, sewer disposal, capacity lease) account for 13% of the annual operating expense.
- Other expenses greater than five percent include sludge disposal (6.7%) and operating expense (5.1%).

These operating expenses are high compared to septage receiving facilities integrated with wastewater treatment plants, given that such facilities can take advantage of operational efficiencies due to higher, more consistent volumes and costs that are less on a per gallon or pollutant basis. A direct comparison with stand- alone septage receiving facilities was not conducted. The STF incorporates relatively new technology and application, and we were unable to identify a similar facility (MBR and ATAD).Based on our evaluation of the STF and familiarity of similar processes at other facilities, we conclude that the operating expenses are high, but cost savings could likely be realized in some areas. One method for determining potential savings is to competitively bid out STF operation.

The estimated operating cost per gallon of waste for 2009, excluding the Bay Harbor remediation project, is $0.086 per gallon, $2.46 per pound of Biological Oxygen Demand (BOD) and $0.76 per pound of conventional pollutant (BOD, TSS, NH3, and Phosphorus). Estimated operating costs for 2010 are lower due to the expected increase in volumes due to the change in service area and more modest increase in costs. Treatment costs in 2010 (excluding special wastes) are $0.050 per gallon of waste, $1.52 per pound of BOD and $0.47 per pound of conventional pollutant. In contrast, the operating cost at the Regional WWTP is approximately $0.33 per pound of pollutant and $0.0015 per gallon.

3.6 TRADITIONAL WASTE VOLUME ESTIMATES

This section describes the approach and results used to project future waste volumes. Projections are based on actual waste volumes and expected regional growth. The analysis is broken into two time periods: a near term analysis addressing 2007- 2009, and a long-term analysis considering a planning horizon of 2010 to 2030.

A complicating factor in estimating traditional waste volumes is the challenge of assessing the impact of price increases on tank pumping frequency. It is expected that pumping will decline as costs increase. Anecdotal reports from haulers suggest that pumping has decreased since the STF began accepting waste, probably due to higher fees. The concept of economic elasticity expresses how supply or demand changes with price. Unfortunately, data and information on pumping costs and rates in the Grand Traverse region is not available in sufficient detail to predict how pumping rates will change when prices increase.

The predicted waste volumes used for plant design were not realized after the price of pumping increased. This may indicate that the price elasticity of demand is great, at least in the short term. Since pumping septic tanks is required to prevent failure and promote a longer service life of the system, pumping may increase in the future as homeowners adjust to the higher rates. Others may switch from septic tanks to alternate systems to reduce pumping, or reduce

pumping at the expense of reducing life of their septic system. Pumpers and haulers are also affected by increased prices and transportation costs associated with the STF. These changes may negatively affect revenue of septage haulers leading some to illegally dispose of septage. The frequency of illegal land application can not be estimated; however, haulers interviewed acknowledged it was taking place and that it was a rare occurrence.

Traditional waste volumes predicted in this report were estimated using a calculated pumping rate from actual waste volume data. This technique should account for the elasticity of septage treatment in the future. However, it incorporates several assumptions and simplifications that add uncertainty to the estimates.

Volumes are projected to increase significantly in 2008 from 2007 values. With six months of 2008 data available for analysis, septage volumes are up 34% and holding tank volumes are up 12%. If these trends continue, 2008 should see approximately 4 MG of septage and 2.9 MG of holding tank waste. Grease is projected at 530,000 gallons. Bay Harbor waste volume is up 85% in 2008 from the previous year. Volumes for 2009 should remain steady due to limited economic growth and no change in the service area.

Projections beyond 2009 have greater uncertainty because they rely on dated estimates (1990 census) of regional population growth and numbers of septic tanks in adjacent counties. Population growth estimates for the region are 11% between 2010 and 2020 and 11% between 2020 and 2030. In addition, data over the 1990 - 2006 period indicate that that the number of homes with septic tanks grew at a slower rate than the population. Our projections of new septic tanks are corrected to account for this difference and we estimate an 8.8% growth rate of homes with septic tanks.

Results of these analyses are presented below. Estimated septage and holding tank waste volumes in coming years increase significantly from current flows, but lag considerably from original estimates used to size the facility.

Volumes for 2007 - 2009

The four categories of waste volume received by the STF include 1) holding tank waste for unsewered homes without septic tanks and port-a-johns; 2) Septic tank waste, or septage; 3) grease trap waste; and special waste (e.g., water from the Bay Harbor remediation site). The volumes for 2007 and 2008 are shown in Table 3-5.

Table 3-5 STF Flows for 2007 and 2008 for All Categories of Waste.

Year	Month	Holding Tank	Septage	Bay Harbor	Port-a-john[1]	Grease	Total
2007	January	144,089	72,550	471,500	3,227	-	691,366
2007	February	191,328	68,855	644,000	2,479	-	906,662
2007	March	167,579	120,565	805,000	4,741	-	1,097,885
2007	April	249,727	254,186	1,161,500	2,705	-	1,668,118
2007	May	235,881	353,402	977,500	3,673	-	1,570,456
2007	June	174,259	275,159	885,500	3,882	-	1,338,800
2007	July	333,761	296,079	782,000	9,151	-	1,420,991
2007	August	315,775	277,387	701,500	5,235	20,596	1,320,493
2007	September	210,377	347,733	1,138,500	4,477	45,939	1,747,026
2007	October	201,584	429,699	1,322,500	-	38,747	1,992,530
2007	November	169,180	387,234	1,299,500	-	60,021	1,915,935
2007	December	189,903	125,990	1,069,500	-	52,547	1,437,940
2007 Total		2,583,443	3,008,839	11,258,500	39,570	217,850	17,108,202
2007 Daily Average[2]		7,078	8,243	30,845	108	597	46,872
2008	January	208,661	108,499	1,391,500		44,019	1,752,679
2008	February	210,661	62,361	1,184,500		29,981	1,487,503
2008	March	215,423	81,445	1,173,000		47,061	1,516,929
2008	April	171,316	447,309	1,624,489		44,425	2,287,539
2008	May	223,438	489,039	1,644,500		47,221	2,404,198
2008	June	300,365	389,424	1,610,000		60,100	2,359,889
2008	July	394,816	378,600	1,575,500		56,338	2,405,254
2008	August	330,405	339,553	1,667,500		56,518	
2008 Total		2,055,085	2,296,230	11,870,989		385,663	14,213,991
2008 Daily Average[2]		8,422	9,411	48,562		1,581	58,254
2008 Projection[3]		2,881,897	4,021,100	20,790,158		526,399	28,219,554

[1] Port-a-john waste categorized as a unique waste in 2007 and Lumped with holding tank waste in 2008.

[2] Daily average flow based on 365 days per year for 2007 and 244 days for 2008 (through August 31, 2008).

[3] Projection based on percent increase realized between 2007 and 2008 actual volumes extrapolated through the calendar year for septage, holding tank and Bay Harbor waste. Grease volume projects for 2008 equal the sum of September 2007 through August 2008.

Data in Table 3-5 indicate that the projected average daily flow for 2008 is 19,414 GPD of septage and holding tank waste. Septage is 54%, holding tank waste is 39% and grease is 7% of the total volume, excluding special wastes. Volumes for the latter are much larger than traditional wastes.

Traditional waste volumes for 2009 are unlikely to change significantly from 2008 volumes. Market forces (i.e., price and need for pumping) influencing waste volumes at the STF will not change significantly in 2009. Furthermore, under unfavorable economic conditions, fewer new tanks will likely be added and homeowners may reduce pumping frequency.

Special waste volumes are dynamic, driven primarily by regulatory need and disposal costs. Bay Harbor is expected to discontinue use of the STF in the near future. CMS' deep injection well permit for disposal has been approved by the US EPA, but it is under appeal by several potentially impacted parties. Disposal of leachate at the deep injection well will depend on the outcome of the appeals process.

Volumes for 2010 - 2030

Projected volumes for traditional wastes were derived from population growth estimates in the 25 mile service area of the STF. Several assumptions were made that add uncertainty to the predictions:

- Each tank will be pumped every six years.
- Septic tanks in the surrounding counties are evenly distributed (e.g., of 25% of the county is within the STF service area, then 25% of the county's septic tanks are assumed to be in this area).
- The percentage of households with septic tanks has remained constant since 1990.
- The number of households in 2010 is unchanged from 2006.
- Illegal land application remains at current levels.
- The increase in the number of septic tanks between 2010 and 2030 is consistent with population growth.

Two other assumptions were made in an attempt to keep the estimates as conservative as possible. These include: No septic tanks from Leelanau County (other than Elmwood Township) and Benzie Count are assumed to contribute flow to the STF. Both of these counties have overlapping septage disposal service from competing facilities and we assumed that the waste would be delivered to the competing facilities.

Table 3-6 presents an estimate of the number of households with septic tanks within the 25 mile radius of the STF. Table 3-7 converts the estimated number of septic tanks to expected waste volumes.

Table 3-6 Households with septic tanks: estimates for counties within 25 mile radius of STF.

	Antrim County, Michigan	Benzie County, Michigan	Grand Traverse County, Michigan	Kalkaska County, Michigan	Leelanau County, Michigan	Manistee County, Michigan	Missaukee County, Michigan	Wexford County, Michigan	Total
1990 Households with Public sewer	2449	1786	11515	942	1409	3672	1090	5597	28460
1990 Households with Septic tank or cesspool	10405	6579	16929	7993	9459	9472	5883	7139	73859
Households with Other means of waste disposal	291	192	296	216	303	186	139	126	1749
1990 Housing Units	13145	8557	28740	9151	11171	13330	7112	12862	104068
2006 Housing Units	16463	11754	39992	11640	14771	14881	9133	16204	134838
2006 Septic Tanks	13,031	9,037	23,557	10,167	12,507	10,574	7,555	8,994	95422
Percentage of County in STF Service Area	18%	01	100%	41%	01	10%	5%	40%	
25 Mile Radius Tank Numbers	2,345	-	23,556	4,168.48	-	1,057	377	3,597	35103

[1] Benzie and Leelanau Counties excluded from assessment because much of the service area overlaps with other disposal options. Elmwood Township tanks are included in the analysis of current flows since they are one of the stakeholder Townships that initiated the project.

The estimated waste volumes reported in Table 3-7 indicate that volumes have the potential to increase significantly when the service area increases in 2010.

Table 3-7 Estimated traditional waste volumes from 25 mile radius service area around STF.

Year	Holding Tank	Septage	Grease	Total Volume (MGY)	Average Volume (GPD)
2010	4,300,000	7,000,000	550,000	11,850,000	32,000
2020	4,700,000	7,700,000	600.000	13,000,000	35,000
2030	5,200,000	8,400,000	650,000	14,250,000	39,000

3.7 SPECIAL WASTE VOLUME ASSESSMENT

3.7.1 Projected Volumes

The reliability of volume projections for special waste is less than that of traditional waste, as the latter is pumped on a fairly regularly basis and must be disposed of at the STF. Special waste disposal options are varied and largely driven by regulatory and market forces. This section of the report outlines wastes and volumes potentially available in the region for treatment at the STF. Whether these wastes are ultimately taken to the STF will likely be a function of several factors including the fee charged by the County to accept the waste, transportation costs, and the cost of other disposal options.

Volume estimates, treatment costs and current disposal methods listed in Table 3-8 were generated via interviews with potential providers of special wastes. Three categories of waste were identified in the region and include industrial wash water (typically described as “oily water”); fruit processing waste (e.g., cherries, grapes); and leachate (i.e., Bay Harbor and landfills).

All special waste sources are currently being disposed of for less than $0.15 per gallon, and these potential STF customers are generally satisfied with their existing method and associated cost. The cost and reliability of acceptance are the primary concerns of all interviewed.

Table 3-8 Special waste type, volume, treatment costs and typical disposal methods.

Waste Category	Volume (gallons/ year)	Typical Disposal Method	Current Cost of Treatment
Industrial	1,500,000 - 3,000,000	Recycled, WWTP	$0.02 - $0.15
Fruit Processing	> 200,000,000 (only ~4.5 million expressed a need for alternate treatment)	Ground application, industrial WWTP,	<$0.05
Leachate	20,000,000	Deep injection, WWTP, STF	<$0.04

Special wastes provide special challenges to the STF. Pre- conditions for acceptance include prescreening of waste characteristics, long term contracts, and a documented quality assurance – quality control program. In addition, a large holding tank (for waste storage and testing purposes prior to entering the facility) is recommended to avoid any issues with treatment logistics. Consideration should be given to the development of a mechanism to share liability and ensure that haulers can pay for issues associated with waste loads rejected by the plant.

3.7.2 Industrial Waste

This waste stream includes a variety of wash water from various manufacturing operations. The waste water is typically characterized as “oily water” and depending on its source, may include varying amounts of solvents, metals and particulates. It is likely that this waste stream would require pretreatment, prescreening and frequent monitoring to ensure that it will not disrupt STF processes.

If pretreatment is determined to be necessary, the cost of design, construction, testing and operation will likely range up to $2.0 million. Potential treatment processes will likely include a skimmer and filter of some type, depending on the characteristics of the wastewater.

3.7.3 Fruit Processing Waste

Primary fruit processing in the region is for cherries and wine grapes. Cherry processing includes drying, brining and washing. The majority of operations (cherry and grape) are able to land apply because the processing operations do not create wastewater with high concentrations of regulated pollutants. Processing operations that concentrate wastewater during the drying and brining processes do have wastewater disposal issues. Currently, local processors are either treating on site using lagoon or mechanical treatment, or trucking wastewater to an offsite treatment facility. Only those processors trucking wastewater offsite are a near term waste source for the STF. It is likely that large volumes of this waste stream would require pretreatment and prescreening to insure that it would not disrupt the processes at the STF. Smaller volumes, containing less than the BOD design load, can likely be accepted at the STF without pretreatment. A comparative advantage of this waste stream is that it is relatively consistent from year to year, recognizing some seasonal variation. The cost of design, construction, testing and operation will likely range up to $2.0 million, depending on volume and strength.

3.7.4 Leachate

This waste stream includes water that drains from landfills, and characteristics vary with the type, design and age of the landfill. Leachate wastewater in the region is disposed of at deep injection wells, WWTP and at the STF. Disposal methods are determined by regulation and cost. It is likely that this waste stream will require pretreatment, prescreening and frequent monitoring to ensure that it will not disrupt STF processes.

If pretreatment is determined to be necessary, the cost of design, construction, testing and operation would likely range up to $3.0 million due to the variable nature of the waste stream.

3.7.5 Special Waste Summary

Special waste disposal options are varied and largely driven by regulatory and market forces. Whether these wastes are ultimately taken to the STF will likely be a function of several factors including the fee charged by the County to accept the waste, transportation costs, and the cost of other disposal options. As of August 2008 high strength Cherry Processing waste appears to be the special waste (other than Bay Harbor leachate) most likely to be available for treatment at the STF. Volumes of this waste should be fairly consistent, thus a long term contract could be evaluated; however, most special waste types will require additional pre-treatment before processing at the STF. The additional capital costs required to add pretreatment and inherent variability of supply make special waste a poor option for reaching financial sustainability. However, since treating some of the special waste locally may help local industries and businesses this option should be considered if grant funding can be secured for capital improvements.

3.8 Plant Capacity Analysis

The Basis for Design Report states that 95,000 GPD is the Design Average Flow and the Peak Hourly Flow Rate is 190,000 gallons per day or 23,750 gallons in an hour (~400 gal/min for an hour). These design criteria are defined in the Ten State Standard as follows:

- **Design Average Flow -** The design average flow is the average of the daily volumes to be received for a continuous 12 month period expressed as a volume per unit time. However, the design average flow for facilities having critical seasonal high hydraulic loading periods (e.g., recreational areas, campuses, and industrial facilities) shall be based on the daily average flow during the seasonal period.

- **Design Peak Hourly Flow -** The design peak hourly flow is the largest volume of flow to be received during a one hour period expressed as a volume per unit time.

To assess plant capacity average summer flows should be compared to the average design flow. This is based on the seasonality of septage flows to the plant that were taken into account during the design phase. This calculation results in 31% capacity for 2008. If the expected increases in traditional waste occur in 2010 due to the increase in service area capacity would increase to 50%. Peak hourly design capacity appears to be sufficient based on the actual data after approximately 3 years of operation. The maximum flow accepted by the plant has been 77,442 Gallons in a day. If the daily peak flow increases proportionally to annual waste volumes it may reach 65% capacity when the service area increases. Based on this analysis the STF has capacity available for increased traditional waste from the increased service area and for special waste.

4.0 FINANCIAL AND OPERATIONAL ALTERNATIVES

4.1 FINANCIAL ALTERNATIVES

4.1.1 Rates and Volume Increases

As indicated in the scenarios presented in Section 3, rate increases alone will not allow the STF to attain long term financial sustainability. The required increase in the user rate will not yield a rate that is competitive with other local septage treatment facilities for households outside of the County. Increasing rates may also further depress the waste volume delivered to the STF from households within the County.

It is also clear that it is not plausible to expect a sufficient increase in septage volumes to allow the facility to continue to charge a user rate at the current level of $0.12 per gallon. Further, even when considering a rate increase in conjunction with a volume increase, the requisite rate is not competitive, nor is the volume level realistic.

4.1.2 User Fee for Disposal

Discussions with the County suggest that charging residents a user fee to cover operation maintenance and depreciation costs is possible. This option will provide the STF with a stable revenue source covering more than half of its anticipated annual expenses. Septic tank owners would pay an annual fee and receive septage treatment in return, on a regular basis, but will still be required to pay haulers for septage transportation. Holding tank and grease trap owners would continue to pay for transportation and disposal costs under the current rate system.

4.1.3 Special Assessment District for Debt Service

This alternative entails the re-evaluation of the debt service agreement to allow for establishment of a special assessment district to cover debt service of capital costs. (Legal counsel should first be contacted for an opinion on this alternative.) Based on discussions with the County, it appears that the facility is not currently allowed to establish a special assessment related to debt service. Given that this option would provide a steady revenue source for the STF, however, it should be further investigated.

4.1.4 Special Wastes Revenue

Special wastes offer an opportunity for additional revenue, but should not be relied upon to provide a long term solution to ensure the financial sustainability of the facility. There are several reasons for this conclusion:

- Most special wastes tend to require additional capital investment in the facility, potentially offsetting any margins that might otherwise be obtained.
- Even under the most optimistic projects, a large volume of a new special waste will be required to generate a significant amount of revenue.
- Even if large volumes were realized, the rate required to have a positive effect on the fiscal health of the facility will likely be higher than the market will accept.

- Businesses generating special wastes tend to be highly price sensitive and will shift with the market if another solution is presented at a lower rate.

Revenue from special wastes are a welcome addition to the STF and obtaining new customers and increased volumes should be aggressively pursued, provided that acceptable margins can be achieved. Given the above factors, however, it is not advisable to rely upon special wastes as a central strategy in attaining long term financial sustainability for the STF. Long-term contracts should be considered when entering into agreements with special waste generators.

4.1.5 Bio-Solids Revenue

The biosolids generated by the STF will be designated Class A and suitable for residential use as a soil conditioner. This product could be marketed and sold in an effort to generate additional revenue for the STF. Due to the low volumes and extensive marketing that this would require this option is not recommended. The revenue generated would not likely have a substantial impact on the financial sustainability of the STF.

This assessment should not diminish the benefit that the County can get from the Class A Biosolids. The material should be used by the Parks and Recreation department to offset existing costs for mulch or soil conditioners.

4.2 OPERATIONS/ENGINEERING COST SAVING MEASURES

Several alternative operation methods for the STF are described below. Each alternative presents conceptual ideas on how the facility may be operated to reduce costs. These options optimize usage of STF processes, reduce treatment at the STF and rely on treatment at the existing regional treatment facility, and optimize existing STF processes with the design of a potential future treatment facility. Net cost savings, as well as other benefits and disadvantages, are discussed for all alternatives.

4.2.1 Suspend MBR and ATAD; Send Screened Waste to WWTP

In this alternative, the MBR and ATAD will be shut down for a short period. Septage will continue to be screened, but then discharged to the WWTP for further treatment. The grease will be screened by a new wedge wire screen, stored in a plastic bag and landfilled. Removing the MBR and ATAD would allow for the STF to be fully or partially automated, thereby reducing staff time at the station from full time to part time. The reduction in operating costs could be as much as $170,000 annually.

Advantages

- A large reduction in cost will be realized to reduce energy and staffing needs at the STF.

- WWTP facilities will be better utilized; the WWTP has primary treatment to remove septage solids and anaerobic digestion, which can produce power instead of consuming it.

Disadvantages

- The potential for odors at the WWTP increases and will need to be addressed.
- Gas and electricity will still be needed at the site to power the septage receiving area and to keep the buildings functional.
- An increase in BOD from the STF would occur. Therefore, it is possible that agreements between the Townships and the City WWTP may need to be evaluated if this change places them above their BOD limits.
- The MBR manufacturer will need to be consulted to devise a maintenance plan while equipment is not in use to ensure that it can be re-integrated into the process once full treatment is resumed.
- This is a short term (as opposed to permanent) cost- cutting action that could be used to limit financial loses while securing alternative revenue sources.

The potential cost savings and expenses of shutting down the MBR and ATAD and sending the screened septage to the Regional WWTP are presented in Table 4-1.

Table 4-1 Net cost savings from closing MBR and ATAD

Category	Expense ($/ yr)	Expense w/ Predicted Savings
Staff Salaries	150,356	80,356
Electricity	149,000	49,000
Chemicals	15,000	0.00
Biosolids	20,000	0.00
Contract Services - Disposal Of Sludge	39,935	0.00
Total Operating Costs	**595,907**	**350,972**

4.2.2 Install Pumps To Drive MBR; Replace Coarse Bubble Diffusers in Aeration Tank with Fine Bubble Diffusers

In this alternative, the MBR units will be improved by the installation of 600 gpm, 20'TDH pumps to drive the mixed liquor through the membranes instead of the airlift pumps. The pumps will improve the membrane flux and increase permeate flow to the design quantity. After this conversion, the blowers will be used only for aeration, reducing the blower horsepower use from 60 Hp to approximately 20 Hp. Installing fine bubble diffusers will produce more filterable mixed

liquor and reduce the blower air demand b 50%, or another 10 Hp. Using pumps to drive the MBR may eliminate the need for the concentrate pumping station, thereby realizing a further reduction in required horsepower.

Advantages

- The STF will provide treatment to incoming wastes.
- Better membrane performance will be achieved at low cost.
- A significant reduction in electrical cost for MBR operation (perhaps over 70%) will be achieved.
- The concentrate pump station will be eliminated.
- Fouling events will be reduced.
- Design capacity for the MBR will be realized.

Disadvantages

- Any remaining MBR warranty may be voided.
- Some capital improvements will be required.

Based on the use of two 10 Hp pumps to feed the MBR (drawing 8 Hp), estimated cost savings are approximately $30,000 per year and should allow for design permeate flow. Pumps can be rented and temporary piping installed to test this alternative. The potential cost savings are presented in Table 4-2.

Table 4-2 Cost savings from MBR retrofit

Category	Expense ($/ yr)	Expense w/ Predicted savings
Electrical Expenses	149,000	119,000
Total Estimated Operating Costs	**595,907**	**566,907**

4.2.3 Abandon ATAD: Truck Waste Activated Sludge (WAS) and Grease to Regional WWTP and Pump Directly to Digester

Based upon data supplied by OMI, the estimated cost to treat a pound of biosolids is $0.046/Lb. The estimated cost of treating the septage directly at the Regional WWTP digester is approximately $9,000/yr plus the grease load. If 6,000-gallon tankers are used to haul the biosolids and grease, with hauling costs of $.03/gallon, the cost of transport would be $82,000/yr. There is no savings by shutting down the ATAD unless hauling costs are less than $0.02/gallon.

4.2.4 Integrate Proposed Future WWTP with Existing STF

In this alternative, the new WWTP will be built at this site. The administration building and the ATAD will become part of the WWTP, thereby providing considerable cost savings and making full use of the ATAD. Designed for a solids load of 10,000 Lbs/day, the ATAD currently handles a load of approximately 700 Lbs/day. The estimated biosolids load from a new, secondary-only treatment plant is 1,200 Lbs./day per million gallons of flow and an influent BOD of 200 mg/L. A more detailed analysis may find that it is more economical to treat the septage in the ATAD than in the MBR.

Advantages

- Construction cost savings will be realized.
- The administration building and paving can be reused.
- The ATAD and rotary drum thickener can be reused.
- Biosolids of exceptional quality will be produced.
- Plant effluent can be used to cool the Simultaneous Nitrification/Denitrification Reactor (SNDR) through a heat exchanger, improving biosolids dewatering and reducing polymer costs.
- The MBR can be reused with associated cost savings.
- Labor savings will be realized, as the County will have a single facility to operate.
- The plant can be built in such a way as to reduce and contain odors.

Disadvantages

- Objections to locating a plant at this site have been voiced, although we recognize that such objections are likely at any site.
- The County has expended time and resources on selecting and planning for a WWTP at the Hoch Road site.

4.3 OTHER COST SAVING MEASURES

4.3.1 Bidding Contract Services

Competitively bidding the operations contract may result in lower costs to the County. Companies compete for the contracts will have incentives to develop innovative cost saving options. On the negative side, this option may have additional regulatory implications for the STF and reduce the good will between county and city, as industrial pretreatment standards imposed by the City could make treating special waste more difficult.

4.3.2 Operate Plant Using County Staff

The County should consider using County staff to operate the STF. This may result in reduced operating costs, although efficiency might diminish due to fewer resources and less experience.

4.3.3 Alternative/ Sustainable Energy as a Solution

Energy costs at the STF are 25% of annual operation costs, and will total approximately $150,000 per year for the next several years. Reducing this expense through alternative and/ or sustainable energy sources will reduce annual costs and improve the STF financial outlook. Application of such alternative energy sources can be time consuming and problematic. Wind and solar, for example, require site specific studies, site upgrades and capital improvements that would need to be paid before realizing a benefit for the STF. These alternative practices may be appealing over the long term with regard to the County's energy needs and Green House Gas reduction goals. Due to the associated capital costs, however, near term financial benefits will be limited. Two options that could be considered include a wind turbine and combustion of by-product methane.

The STF is a significant energy user and would require a one MW utility grade wind turbine (similar to the TCLP turbine on M-72) for full power. The pay back period for wind projects is typically between six and 15 years but can be as long as 30 years. Costs for a one MW project may range from $1.0 million to $3.0 million.

Combustion of methane produced from the septage is a possible option if a new wastewater treatment plant is located adjacent to the STF or the ATAD could possibly be converted to an anaerobic digester. Both options would generate electricity. Conversion of the ATAD to an anaerobic digester presents some technical challenges that reduce the feasibility of this option. These challenges include:

- The ATAD cover probably cannot be certified for a pressure of 10 water column inches; thus, this change might need a new cover.
- An engine generator set would be needed.
- The septage is already partly digested and will not generate much gas.
- The grease may generate quite a bit of gas, but grease volumes are low.

Between the cost of an appropriate cover and the engine generator set, there may not be a quick payback for this option. This idea can be implemented with the future wastewater treatment plant wherever it is located. Locating it adjacent to the STF will allow for the possibility that the septage, grease and holding tank waste could contribute to methane production.

5.0 RECOMMENDED ACTIONS

Our analysis of the operational, engineering, financial and marketing dimensions of the STF has identified a range of opportunities to enhance the facility's efficiency and financial sustainability. Section 5.1 presents our primary recommended action, which "packages" many of these opportunities into an approach that results in financial sustainability. Section 5.2 presents a secondary recommended action that can be pursued in the event that the "user fee" feature of our primary recommendation is, for any reason, determined not to be feasible. This is followed (Section 5.3) by additional short and longer term measures that can be pursued in conjunction with either recommended action to contribute to STF efficiency and financial sustainability.

5.1 Primary Recommendation

Our primary recommendation to achieve financial sustainability of the STF includes the following modifications to how the plant is financed and operated:

- Increase permit fee on new septic and holding tanks from $150 to $1,000 starting in 2010.
- Implement opportunities for operations savings identified within this report related to power ($30,000) and staffing ($75,000) in 2009. For the financial modeling these savings are incorporated beginning in 2009. Subsequent to 2009 these savings are indexed by the applicable assumed increases.
- Implement a special assessment or user fee for septic tank and grease traps within Grand Traverse County and no longer charge the $0.12per gallon for disposal.
- Accept traditional waste from outside the County and within the 25 mile service area to realize an additional 3,500,000 gallons of septage and grease on average each year.

Under this scenario operations have been funded and the target working capital and reserves (TWC&R) balance of approximately $1.5 million has been established by the end of 2014. This scenario results in operational savings of over $700,000 through 2014.

In lieu of the disposal charge of $0.12 per gallon septic/grease tank owners within Grand Traverse County and Elmwood Township will be required to pay an annual assessment on their tank. Per discussion with the County the STF is allowed to assess for operations and items related to capital. Assuming all of the components related to the target working capital and reserves qualify, the annual assessment would be the greatest in 2009 because no waste from outside the county is realized and increase from $25 in 2010 to $28 in 2014. If pumping costs are included annual costs to households would be $72 in 2009, $65 in 2010 and increase to $68 in 2014. These fees are less than the average annual costs to a typical household utilizing the regional wastewater treatment system. Lastly, this scenario forecasts that a required contribution by the stakeholder communities will not be necessary through 2014 if estimates for septage, grease and holding tank volumes from outside the County are correct. The relevant results related to cash outflows, revenues and stakeholder impacts for this recommendation are displayed in Table 5-1.

Table 5-1 Financial details of the primary recommendation.

	Year Ended Dec,	2009	2010	2011	2012	2013	2014
Cash Outflows	Operating Costs	$600,421	$661,719	$693,606	$727,810	$764,703	$804,356
	Potential O&M Savings	$105,000	$109,875	$115,097	$120,697	$127,113	$134,001
	Net Operating Costs	$495,421	$551,844	$578,509	$607,113	$637,590	$670,355
	Debt service	$584,426	$574,870	$589,500	$577,900	$615,826	$601,856
	Retainers to contractors	$216,973	-	-	-	-	-
	Repayment of County loan	$75,000	$75,000	$75,000	$75,000	-	-
	Capital improvements	$ -	$100,000	$100,000	$100,000	$100,000	$100,000
	Total cash outflows of STF	**$1,371,820**	**$1,301,714**	**$1,343,009**	**$1,360,013**	**$1,353,416**	**$1,372,211**
Revenues	Outside County Waste		$360,000	$360,000	$360,000	$360,000	$360,000
	Special waste	$500,000	$500,000	$500,000	$500,000	-	-
	Holding tanks	$111,465	$111,465	$111,465	$111,465	$111,465	$111,465
	Permit fees	$43,750	$250,000	$250,000	$250,000	$250,000	$250,000
	Revenue from Special Assessment	$743,679	$565,248	$642,395	$663,418	$611,633	$649,173
	Total Revenues of STF (2)	**$1,398,894**	**$1,786,713**	**$1,863,861**	**$1,884,883**	**$1,333,099**	**$1,370,639**
Stakeholder Expenses	Septage/Grease User Rate (assuming 23,000 tanks) (1)	$32	$25	$28	$29	$27	$28
	Homeowner annual average cost spread over a 5 year pumping cycle (including a $200 pumping fee)	$72	$65	$68	$69	$67	$68
	Total Annual Contribution by Stakeholder Communities	$ -	$ -	$ -	$ -	$ -	$ -

Notes: (1) Special assessment/ user fee smoothed to avoid sharp annual changes.
(2) Cumulative difference between total revenue and total cash outflows is the $1.5 million TWC&R.

5.2 Secondary Recommendation

The difference between the primary and secondary recommendation is that the secondary recommendation does not include of a special assessment/ user fee for septic tank and grease traps within the County. In the secondary recommendation the $0.12 per gallon disposal fee is retained. The shortfalls between cash outflows and revenues are funded by annual contributions from the stakeholder communities.

Under this scenario operations have been funded and the target working capital and reserves balance of approximately $1.5 million has been established by the end of 2014. This scenario results in operational savings of over $700,000 through 2014; however, stakeholder communities provide $209,571 annually to meet these targets.

For this recommendation the user disposal rate is set at $0.12 per gallon for septage and grease and $0.04 per gallon for holding tank waste. The annual average cost to a septic tank owner assuming a pumping fee of $200 and a pumping cycle of 5 years is $69 per year. This amount is significantly less than the average sewer charges in the townships using the regional treatment system. Lastly, this scenario forecasts a total required contribution by the stakeholder communities of approximately $200,000 annually through 2014. The relevant results related to cash outflows, revenues and stakeholder impacts for this recommendation are displayed in Table 5-2

Table 5-2 Financial details of the secondary recommendation

	Year Ended Dec,	2009	2010	2011	2012	2013	2014
Cash Outflows	Operating Costs	$600,421	$661,719	$693,606	$727,810	$764,703	$804,356
	Potential O&M Savings	$105,000	$109,875	$115,097	$120,697	$127,113	$134,001
	Net Operating Costs	$495,421	$551,844	$578,509	$607,113	$637,590	$670,355
	Debt service	$584,426	$574,870	$589,500	$577,900	$615,826	$601,856
	Retainers to contractors	$216,973	-	-	-	-	-
	Repayment of County loan	$75,000	$75,000	$75,000	$75,000	-	-
	Capital improvements	$ -	$100,000	$100,000	$100,000	$100,000	$100,000
	Total cash outflows of STF	**$1,371,820**	**$1,301,714**	**$1,343,009**	**$1,360,013**	**$1,353,416**	**$1,372,211**
Revenues	Septage/ Grease	$544,257	$903,467	$903,467	$903,467	$903,467	$903,467
	Special waste	$500,000	$500,000	$500,000	$500,000	-	-
	Holding tanks	$111,465	$111,465	$111,465	$111,465	$111,465	$111,465
	Permit fees	$43,750	$250,000	$250,000	$250,000	$250,000	$250,000
	Total Revenues of STF	$1,199,472	$1,764,932	$1,764,932	$1,764,932	$1,264,932	$1,264,932
Stakeholder Expenses	Septage/Grease Disposal Fee ($/gal)	$0.12	$0.12	$0.12	$0.12	$0.12	$0.12
	Homeowner annual average cost spread over a 5 year pumping cycle (including a $200 pumping fee)	$69	$69	$69	$69	$69	$69
	Total Annual Contribution by Stakeholder Communities (1)	$209,571	$209,571	$209,571	$209,571	$209,571	$209,571

Notes: (1) Cumulative difference between total revenue and total cash outflows plus contributions by stakeholder communities is the $1.5 million TWC&R.

5.3 Other Recommended Measures

We offer several recommendations based upon our observations of the facility cash outflows, operating efficiencies, predicted traditional and special waste volumes, and the modeled scenarios. These recommendations are in addition to those quantified and discussed in the Primary and Secondary Recommendations. Presented below, these recommendations may provide additional cost savings, energy savings, generate other waste sources and allow more consistent revenue sources.

1. Other ideas described in Section 4.3 (e.g., competitively bidding out operations) should be considered. Given that operating costs are only half of the facility's annual cash outlay (debt representing the other half), it is not possible to rely upon operational efficiencies alone to attain a financially sustainable facility at current user rates and flow levels.

2. Remove barriers preventing communities outside Grand Traverse County, but within the 25 mile service area from sending traditional waste to the STF. For example, the STF operating plan requires Townships to pass an ordinance before the STF will accept the waste. This provision should be removed or ordinances encouraging Townships (many outside of Grand Traverse County) to send their traditional waste to the STF should be championed by the STF.

3. Examine all possible additional special wastes that can provide high volumes with little or no additional capital improvements to the facility. This includes Bay Harbor and oily waste water from industrial sources. Cooperation and coordination with the Regional WWTP will be required.

4. Consider additional improvements to the facility, provided that a long term contract is agreed to by the special waste generator(s), and/or the new WWTP can be located on the current site. Any improvements should be considered in the context of the new WWTP.

5. Based on our discussions with the County, it appears that the facility is not presently allowed to establish a special assessment related to debt service. However, this possibility should be further investigated, as it would provide a draw down on debt service costs. Legal counsel should be consulted on the recommendation.

6. Locating the new wastewater treatment facility adjacent to the STF in order to utilize as much of the STF buildings and processes as possible.

7. Evaluate the potential to re-finance the debt to get a lower annual payment.

6.0 MARKETING AND EDUCATION PLAN

6.1 INTRODUCTION

The ultimate success of the STF is founded upon three essential elements: 1) operational efficiency to ensure optimal facility performance; 2) a marketing strategy to maximize exposure to (and usage by) the universe of current and prospective customers; and 3) an education strategy designed to secure and retain current/ prospective customers by highlighting associated environmental, economic and social benefits. These elements are mutually dependent, and a coordinated initiative that features all three will realize the ultimate goal of a well- operated and fully utilized facility that is financially self sustaining on a long-term basis.

The latter two elements (i.e., marketing and education/ outreach) are sufficiently intertwined to warrant a single plan. The marketing dimension is directed at identification of potential waste generators and volumes; current and prospective competition; and the availability/ feasibility of incentives to attract and retain customers. The education/ outreach dimension is directed at improving trust and credibility among current and potential customers, and identifying delivery methods and partners that can effectively convey the environmental, economic and social benefits of facility usage.

6.2 PLAN DEVELOPMENT METHODOLOGY

Our overall work plan featured four principal tasks: 1) financial forecasting; 2) market analysis; 3) education/ outreach analysis, and 4) a facility evaluation and optimization study. The first task employed a forecasting model to assess the financial characteristics/ feasibility of several scenarios constructed by altering treatment volumes, rates, composition (i.e., household, commercial and “special” wastes), and revenue mechanisms. This task was informed by the fourth: a comprehensive review of facility processes, labor rates and operational costs in the interest of optimizing financial performance and sustainable revenue. Tasks Two and Three were pursued simultaneously, informed by the outcomes of the other tasks to ensure that marketing and education/ outreach strategies would be directed at feasible scenarios.

We have devised a Marketing and Education Plan to implement our primary recommended action (Section 5.1), which features efforts and incentives to 1) enhance facility usage by existing customers; 2) expand the overall customer base; 3) diversify the customer base with a special focus on “special waste” handling services; and 4) achieve a reliable revenue stream by instituting a user fee (for operations and maintenance) and a special assessment (to retire debt service.) With modest modifications, our proposed Plan will also support our secondary recommended action, as presented in Section 5.2.

Plan development was preceded (and informed by) a review of relevant documents including the Grand Traverse County 2009 Strategic Plan, news articles on the facility, informational materials on septage treatment prepared by other parties (e.g., Michigan State University Extension), and the elements of a public information campaign prepared for (but never fully implemented by) the Grand Traverse County Department of Public Works.

6.3 PLAN GOAL AND OBJECTIVES

The goal of the Marketing and Education Plan is to achieve financial long- term, sustainable operation of the Septage Treatment Facility. This will be accomplished through objectives that include attaining heightened operational efficiencies; attracting and retaining a growing and diversified customer base; expanding the market from both a geographic (i.e., service area) and service basis (i.e., special waste); establishing payment arrangements to facilitate reliable and predictable revenue streams; and implementing rate adjustments and related incentives to increase market share and ensure financial self sustainability via increased waste volumes. Education is a critical element in achieving these objectives, and in building trust and credibility in the facility and its operators. All parties (i.e., policy makers, service providers, customers) must have a full understanding of the environmental, economic and social benefits of the facility, and how those benefits outweigh those of any other waste treatment alternative or competing service provider.

6.4 TARGET AUDIENCE

Our proposed Marketing and Education Plan is focused on seven primary sectors, each requiring a distinct approach to achieve the stated goal: a well- operated and fully utilized facility that is financially self sustaining on a long-term basis. These sectors are listed below, accompanied by a brief explanation of their importance in plan implementation:

- **Existing Residential and Commercial Customers:** Retaining the existing customer base (and associated waste volume) provides a foundation upon which market expansion efforts can rely. Various incentives (e.g., payment user fees arrangements, long term contracts) can be directed at existing customers to promote more frequent pumping, thereby increasing waste volumes (to benefit the facility) while reducing by-volume pumping costs (to benefit the consumer).
- **New Residential and Commercial Customers:** The financial model indicated that the long term financial viability of the facility will be dependent, in part, on growth in the residential and commercial market. This target audience sector includes existing homes and businesses that have not yet previously used the facility, as well as new home construction and newly established businesses. This sector is particularly promising, given that the geographic service area for the facility is slated to expand in 2010, allowing Grand Traverse County to compete with other facilities for waste flow.
- **Businesses with Special Wastes Requiring Treatment:** This sector includes a range of businesses that are required to treat substantial volumes of special waste (e.g., restaurants, fruit processing, residential developments), and may find the STF to be a convenient and economical way to do so. Our analysis determined that the potential market for such services is substantial. However, due to changing market conditions, competition and alternate treatment technologies, primary reliance upon such waste flow for long term financial sustainability of the facility is not advisable.
- **County, City and Township Officials:** Decision makers within local units of government will have a key role in shaping and approving any regulatory, financial or

related policy initiatives pertinent to the STF. Among others, this would include establishment of user fees, a special assessment district; local government contributions to facility operations and maintenance; and/ or new payment programs/ long term contracts that affect current and prospective residential and commercial customers.

- **Voting Public in the Current/ Prospective Facility Service Area**: The success of any public policy/ ballot initiative related to facility operations and maintenance (such as the special assessment district noted above), will ultimately be dependent upon a well-informed and actively involved public. Interest in the STF will extend beyond prospective users and, consequently, education/ outreach efforts need to target the entire voting population.
- **School Systems**: The STF should be marketed (and appropriately so) as one component of a larger, community- wide environmental stewardship ethic. The long term success and financial sustainability of the facility will be greatly enhanced if it is "institutionalized" within the community, and considered an essential part of the community's accepted environmental stewardship practices (such as recycling programs, household hazardous waste disposal and watershed protection). This ethic can be cultivated by targeting area school systems through various mechanisms such as age- appropriate literature, speakers and tour/ field trip opportunities.
- **Potential Partners/ Advocates**: Grand Traverse County has expressed an interest in partnerships with agencies/ organizations that might assist in the development and implementation of a Marketing and Education Plan. Such entities need to be identified and approached in the early stages of the process, and provided with a clear understanding of the benefits associated with their involvement. Partners/ advocates will likely be found in the form of community groups, citizen environmental organizations, state regulators (e.g., Michigan Department of Environmental Quality), businesses (including septage haulers), business organizations, and related entities.

Each of these target audience sectors will need to be approached strategically, with "customized" messages, materials and incentives that resonate with their members, as noted in the "Delivery Method" section below.

6.5 MESSAGE

Efforts to enhance the usage and long term financial sustainability of the STF require a compelling rationale that clearly presents associated benefits to the various target audience sectors. Three such benefits (i.e., environmental, economic and social responsibility) are presented below, accompanied by a message that will resonate with those sectors.

- **Environmental:** The full usage and long term financial sustainability of the STF is a sound investment in the future of the Grand Traverse region. Facility operations go hand- in- hand with other innovative environmental stewardship initiatives that the community has become so well known for. The facility protects precious surface and

groundwater resources by eliminating a leading pollutant source that threatens the health and cleanliness of the Bay and inland waters, including drinking water sources. In so doing, it safeguards the integrity of the region's water and related land resources, the health and quality of life of its residents, and the health and viability of fish and wildlife.

- **Economic:** The STF is also a sound investment in the economic future of the region and its individual residents. Its operation, coupled with incentives to encourage regular pumping by residential and commercial customers, will extend the life of septic systems and reduce the "per pump" cost to the customer. Facility users will finds operations and maintenance costs to be far less than other waste management alternatives such as expanding sewerage systems - a practice that leads to urban sprawl and additional associated expenses for the community and its residents. In addition, a fully used and efficiently operating system reduces the likelihood of improper waste disposal methods, as well as the prospective need for costly regulations and/ or pollution control programs.

- **Social Responsibility:** The full use and efficient operation of the STF is consistent with the region's strong environmental stewardship ethic. As a mechanism for waste management and pollution prevention, the facility helps advance the environmental protection goals embraced by the community through various initiatives (e.g., Grand Vision, Boardman River Dams Committee) and the many citizen- based environmental and resource conservation organizations active in the region. It reaffirms the region's leadership role in innovative environmental stewardship programs and ensures the viability of a locally- provided service.

These three messages can provide the basis for a marketing and education/ outreach campaign, adjusted as needed for the individual target audience sectors.

6.6 PRODUCTS, DELIVERY METHODS AND TIMELINE

The strategic selection and execution of delivery methods is fundamental to the success of a Marketing and Education Plan. Messages must be consistent, clearly stated and resonate with various target audiences (i.e., highlight the benefits of STF operations at the community, business and homeowner level.) Messages must also be presented on a regular and continuing basis to "saturate" these audiences through various media (e.g., print, electronic). In addition, delivery methods should be directed at "institutionalizing" the facility, characterizing it as an integral feature of the region's environmental stewardship ethic. Finally, delivery methods should embrace a partnership approach, enlisting other parties (e.g., citizen environmental and resource management groups, business associations, school systems) as advocates that can further publicize the environmental, economic and social responsibility benefits of the STF.

The following is a descriptive listing or "tool kit" of products and delivery methods that can be incorporated into an ongoing education campaign directed at identified target audiences. Selection and use of these and related methods will vary with the nature of the objective (e.g., soliciting new customers, announcing a new service, advocating for a user fee or special assessment district).

- **Media Event to Initiate Education Campaign:** Organize an event to "re-introduce" local media, decision makers and opinion leaders to the STF and associated plans for enhanced use and financial self sustainability.
- **Press Kit, Advisories and News Releases:** Prepare, disseminate and regularly update a press kit to introduce members of the media to facility operations, benefits and future plans. Periodically prepare and disseminate press advisories and news releases on developments of particular interest.
- **Public Service Announcements**: Thirty to 60 second PSA spots on local radio and television will introduce the general public to the STF, highlight associated benefits, help recruit new customers and, as needed, build public support for special assessments, user fees or other policy/ financing mechanisms that require action by elected officials and/ or the voting public.
- **Utility Bill Mailings:** An informational flyer/ brochure inserted into utility bills or other mailings from public entities (e.g., newsletters, tax assessments, official notices) provide a cost effective means to communicate with the general public.
- **Newsletter and Other Direct Mail**: A periodic newsletter (quarterly or semi-annual) directed to current and prospective customers in the service area can be effective in informing them of facility benefits and related developments. Direct mail can also be used for other discrete groups, such as licensed septage haulers.
- **Articles and Newsletter Inserts**: Numerous newsletters and other periodic publications of agencies and organizations in the region offer a vehicle for guest articles, advertisements and inserts to promote the facility and its benefits.
- **Informational Brochure and Fact Sheets:** A "stand alone" brochure introducing the purpose, function and benefits of the STF, along with contact information, can be widely distributed to local government units, businesses, Chamber of Commerce, citizen organizations and related entities for distribution via tourism/ information kiosks, lobby displays and related mechanisms. Fact sheets can also be periodically produced on topics of interest (e.g., facility operations and benefits, septic/ holding tank maintenance, information on licensed haulers).
- **Partnership Building:** Various public and nongovernmental entities with a vested interest in the success of the STF can be approached, as partners, to advance implementation of the Marketing and Education Plan. Partnership functions can include distribution of facility brochures; showcasing facility benefits in newsletters, meetings and websites; and including facility information in outreach efforts to new residents and businesses.
- **Speakers' Bureau:** The County could compile and maintain a listing of individuals qualified to speak about the STF in various venues (e.g., homeowner associations, Chamber of Commerce, trade associations, schools, radio and televisions shows). The

availability of this service can be publicized via numerous communications pathways (e.g., facility website, mailings, and informational brochures).

- **Website and Website Linkages:** A prominently displayed page on the Grand Traverse County website, or a separate but fully linked website, is an important dimension of a Marketing and Education Plan. The site would provide a wealth of information about its purpose, operations, benefits and financing arrangements. It could also provide general advice and guidance on septic tank/ holding tank maintenance and related considerations. The site would be extensively linked to the websites of various units of local governments, and also provide hyperlinks to a range of other prospective information sources of interest to area residents and businesses (e.g., county extension).
- **Hotline:** A dedicated, 24 hour information hotline can be established for the convenience of interested parties. It would be staffed during normal business hours and also provide taped messages and referrals to other information or emergency numbers, as appropriate.

Marketing and education activities must be maintained on an ongoing basis in the interest of 1) restoring and maintaining trust in the facility and its operation; 2) retaining existing customers; and 3) attracting new customers by highlighting facility services and benefits. A detailed sequence of events and timeline for these activities should be prepared and implemented immediately upon the County's acceptance of a strategy to ensure the long term financial sustainability of the facility. The various products identified (e.g., press kit, informational brochure, initial PSAs/ newsletter/ fact sheets, speaker's bureau, web site, hotline) should be available for release at the time of the media event to "re-introduce" the facility, as should the many partners enlisted to support the marketing and education/ outreach efforts. Subsequent events, as well as the release of additional products, will be strategically timed to keep the facility in front of target audiences on a continuing basis.

6.7 LEAD AGENCY/ PARTNERS

The Grand Traverse region is home to a substantial number of public and nongovernmental entities with missions and programs consistent with the STF and it associated environmental, economic and social responsibility benefits. An effective Marketing and Education Plan will take full advantage of these prospective partnerships.

The Grand Traverse County Department of Public Works is the appropriate entity to coordinate implementation of the Marketing and Education Plan, given its operational and financial responsibilities for the facility, and the importance of ensuring a timely, consistent message to target audiences. In so doing, the Department would benefit substantially from the formation of a Marketing and Education Advisory Committee populated by appropriate representatives of local pubic and nongovernmental entities.

Staffed by the Department of Public Works and meeting on a quarterly basis, this committee would be responsible for advising on plan development and periodic refinement; assisting with plan implementation by supporting specific tasks; recruiting other agencies and organizations as

partners in plan implementation; and advising on the selection of a public relations consultant, as needed, for technical support. A committee comprised of 8-12 individuals representing a cross section of community interests would be appropriate, with staggered three year terms and appointment of a chair and vice- chair by the membership.

Prospective members, to be appointed by the Grand Traverse County Board of Commissioners, might be drawn from the following sectors of the community:

- **Business Interests and Associations** (e.g., licensed septic pumping services, fruit producers, restaurants, hotels, developers, Chamber of Commerce, Northwest Michigan Onsite Wastewater).
- **Local Officials and Associations** (e.g., county, city, village and township representatives within facility service area, Northwest Michigan Council of Governments).
- **Education and Advisory Organizations** (e.g., county extension, Michigan Sea Grant, Great Lakes Water Studies Institute- Northern Michigan College, Land Information Access Association, Traverse City Area Public Schools).
- **Environmental and Resource Stewardship Organizations** (e.g., The Watershed Center, Conservation Resource Alliance, Grand Traverse Conservation District, Grand Traverse Regional Land Conservancy, Northern Michigan Environmental Action Council).
- **"At large" Members**: drawn from the community of existing or prospective residential and commercial customers.