CHARBERT
DIV. OF NFA CORP.

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September 6, 2005

David Chopy
Supervising Sanitary Engineer
Rhode Island Department of Environmental Management
Office of Compliance and Inspection
235 Promenade Street
Providence, Rhode Island 02908-5767

RECEIVED
SEP 6 2005
Environmental Management
Office of Compliance & Inspection

Re: Wastewater Alternatives Report
Charbert, Division of NFA Corp.

Dear Mr. Chopy:

Pursuant to Section C(4)(d) of the Consent Agreement executed on July 5, 2005, Charbert, Division of NFA Corp. submits the enclosed Wastewater Alternatives Report. Pursuant to Section C(4)(e) of the Consent Agreement, Charbert will publish a notice of availability of this Report in a major local newspaper and provide the opportunity for a public meeting within thirty days of the date of submission of this Report.

Thank you for your attention to this matter. If I can be of any assistance please do not hesitate to call.

Very Truly Yours,

Michael S. Healey

Michael S. Healey, P.G.
Director of Environmental Affairs
Charbert Div. of NFA Corp.

Cc: Ms. Terry Simpson, Rhode Island Department of Environmental Management, UIC Program, 235 Promenade Street Providence, Rhode Island 22908-5767

Town Clerk, Town of Richmond, 5 Richmond Townhouse Rd, Wyoming, RI 02898

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Charbert

Wastewater Alternatives Report

September 2005

Prepared By

Acheron
Engineering, Environmental & Geologic Scientists
Newport, Maine

1.0 Introduction

This Wastewater Alternatives Report was prepared by Acheron on behalf of Charbert, Division of NFA Corp. Charbert retained Acheron in the spring of 2004 to investigate and evaluate options for treating and discharging Charbert's wastewater at its facility in Alton, Rhode Island. The report first provides background information and data on the volume and characteristics of Charbert's wastewater. The report then presents the potential alternatives for treatment of this wastewater, and the options for discharging the wastewater. The report then discusses Charbert's proposed alternative to discharge the wastewater into rapid infiltration beds. Charbert has already begun pilot scale evaluations of treatment options for this discharge alternative, which are discussed in the Section 6. Finally, Section 7 discusses management and disposal of sludge from these wastewater treatment processes.

2.0 Description of Charbert

Charbert, Division of NFA Corp. is a manufacturer of fine warp and circular knitted stretch fabric. The primary use of the fabrics is in intimate apparel, swimwear, athletic applications, as well as medical products. Approximately 4.5 million yards of fabric are dyed and finished at the facility annually. The primary manufacturing operations consist of bleaching, dyeing, packaging, and storing of knitted fabrics for shipment. The wastewater generated during the fabric dyeing and washing processes is first piped to a pump house located southwest of the existing manufacturing building. The pump house discharges to one of the three infiltration lagoons located in the southern portion of the site.

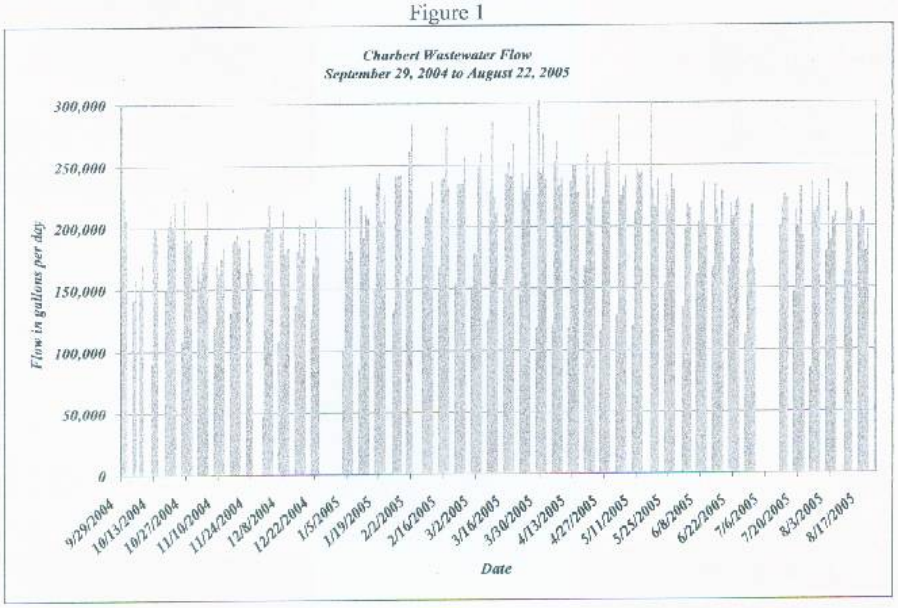
3.0 Volume and Characteristics of Charbert's Process Wastewater

The textile dyeing and processing operations at Charbert generate an average of approximately 250,000 gallons per working day of process wastewater. The process wastewater from the dye house flows to a pumping station located south of the dye house. The pumping station is equipped with a flow meter that measures the pumping rate and the total quantity of water delivered from the pumping station to the existing lagoons.

A. Wastewater Volume

The following chart summarizes the data collected from this flow meter. The chart depicts graphically the daily flow of process wastewater at the Charbert facility.

Figure 1



In order to evaluate alternatives for treatment and discharge, the quantity of wastewater needs to be known. Acheron evaluated the data in Figure 1, above, using a statistical analysis, to understand the fluctuation and frequency of wastewater flow rates. The following chart provides the results of this statistical analysis on process wastewater flow data collected from September 29, 2004 to early July, 2005.

Parameter	Average mg/L	Minimum mg/L	Maximum mg/L
BOD5	234	51	616
COD	1103	612	2100
TSS	25	5	69
Total Chromium	0.232	0.001	1.26
Total Lead	0.003	0.001	0.020
Total Copper	0.044	0.001	0.356
Total Zinc	0.073	0.007	0.256
Total Nickel	0.003	0.002	0.005

4.0 Wastewater Treatment Alternatives

Next, Acheron evaluated potential alternative treatment options for Charbert's wastewater. Acheron used several EPA reference documents and regulatory guidelines and standards to determine feasible options for the wastewater from a manufacturer like Charbert. These included EPA's *"Development Document for Effluent Limitations Guidelines and Standards for the Textile Mill Point Source Category."*(1982). This document provides a detailed analysis of the type of wastewater treatment commonly used by the textile industry, and lists the following as potentially feasible treatment options:

1. Aerated Wastewater Treatment Ponds
2. Chemical Coagulation (Physical/Chemical Precipitation Technology).
3. Biological Activated Sludge
4. Biological Activated Sludge combined with physical/chemical polishing.

Acheron also reviewed EPA's Effluent Limitation Guidelines Knit Fabric Finishing subcategory, since Charbert's operations fall under this category. This Guideline identifies biological treatment as the "Best Practicable Control Technology Currently Available" (commonly referred to as BPT Effluent Standards) for the Knit Fabric Finishing subcategory and provides recommended effluent limitation guidelines based on the best performing biological wastewater treatment facilities in that subcategory.

Acheron also reviewed EPA's "Best Available Technology Economically Achievable" (commonly referred to as BAT Effluent Standards) for certain subcategories, including the Knit Fabric Finishing subcategory. This standard identifies biological treatment followed by multi-media filtration as the applicable technology to achieve compliance with the BAT standards. Multi-media filtration is included within the definition of "physical/chemical polishing" referred to above.

Given these guidelines, Acheron identified these above four wastewater treatment technologies as being potentially applicable and appropriate for treating Charbert's wastewater. Note that the fourth technology is essentially a combination of the third technology plus a polishing filter.

Acheron next took these alternatives and applied initial screening criteria to obtain some general determinations about feasibility. The following table provides a list of these screening criteria and general comments about how each of the screening criteria applies to each respective alternative.

Charbert Wastewater Alternatives Evaluation			
	Optional Treatment Technologies		
	Aerated Treatment Ponds	*Physical/Chemical Treatment*	*Biological Activated Sludge*
Evaluation Criteria			
Nature of Process Wastewater	Technology is applicable	Technology is applicable	Technology is applicable
Volume of Process Wastewater	Technology is applicable	Technology is applicable	Technology is applicable
Toxicity of Process Wastewater	Handles shock loading well	Shock loading not a concern	System needs adequate equalization
Historical performance	Variable	Variable	Good
Short and long term performance	Variable	Unknown	Good
Effluent Quality	Reflects low efficiency	Unknown	Good
Potential for water recycle	Low	Low	Potentially High
Sludge			
Quantity	Small	Large	Moderate
Disposal options	Organic sludge, multiple options	Chemical sludge, fewer options	Organic sludge, multiple options
Potential off-site impacts	To Be Determined (1)	To Be Determined (1)	To Be Determined (1)
Technical implementability			
Construction	Not complicated	Moderately complex	Complex
Operation	Not complicated	Challenging	Moderately Complicated
Potential to generate odors	Low to moderate	Low	Low
Space availability	Large area required	Small space required	Moderate space requirement
Cost			
Construction	Medium	Low	High
Operation	Medium	Medium	Medium

(1) Potential off-site impacts can only be evaluated following completion of pilot studies to define effluent quality.

The selection of the type of wastewater treatment technology to apply to a given wastewater is driven in part by the criteria listed in the table above and in part by the limits imposed by the Rhode Island Department of Environmental Management for the discharge from the treatment plant. The following section describes the discharge options evaluated by Charbert and how the results of that evaluation influenced the evaluation of treatment options.

5.0 Discharge Options

The selected treatment technology must be capable of meeting discharge limits imposed in licenses and permits issued by RIDEM. In July, 2004, Charbert personnel and their consultants met with RIDEM to discuss the options for the discharge of treated wastewater from a proposed wastewater treatment plant. Much of the discussions dealt with RIDEM's permit application procedures and the methods used by RIDEM to calculate potential limits for various discharge options.

During discussions with RIDEM, two discharge options were identified for the Charbert facility. Those options are:

- Discharge to the Pawcatuck River
- Discharge to the land by some form of land application technology

The results of the evaluation of each of these options are described in the following sections.

5.1 Discharge to the Pawcatuck River

All discharges to surface waters in the State of Rhode Island are regulated under DEM's "Regulations for the Rhode Island Pollutant Discharge Elimination System ("RIPDES"). All discharges of pollutants to surface waters in Rhode Island are required to obtain a RIPDES permit, which contains limits and conditions that regulate the type, nature and quantity of pollutants that can be discharged.

Limits in RIPDES permits are based on the more stringent of two standards:

- Performance standards
- Water quality standards

Performance standards, commonly referred to as technology-based effluent standards, for the textile industry are published in 40 CFR Part 410. These standards are derived based on the size and type of the manufacturing operation. Charbert is classified as a "knit fabric finisher" and the technology based standards for knit fabric finishers are published in 40 CFR Section 410.56.

Water quality based standards for the State of Rhode Island are specified in the Rhode Island Water Quality Regulations. These regulations include a wide variety of in-stream standards and requirements for each classification of surface water in Rhode Island. The Pawcatuck River in Alton is a Class B river. The numerical and narrative standards for Class B waters that are published in the Rhode Island Water Quality Regulations are used by RIDEM to calculate water quality based limits for every discharge to surface waters in Rhode Island. The limits for any discharge are based on the assimilative capacity of the receiving water at low flow conditions. The assimilative capacity of the receiving water is defined as the difference between existing conditions in the receiving water and 80% of the water quality standard for any particular pollutant. There are water quality standards for several hundred pollutant parameters. Charbert used the federal performance standards and the Rhode Island water quality standards to calculate potential permit limits for a discharge to the Pawcatuck River.

Based on an evaluation of the Federal Effluent Limitation Guidelines, Charbert determined that all four of the treatment options identified in Section 4 could likely treat the process wastewater from Charbert and produce an effluent of sufficient quality to meet the federal performance base standards. Charbert also determined that it is very unlikely that any of the treatment options identified in Section 4 could likely treat the process water from Charbert to meet the Rhode Island's surface water quality based standards. The principal reason for this conclusion is that two large textile mills already exist on the Pawcatuck River. One is upstream of Charbert and one is downstream of Charbert. Each of these mills already has RIPDES permits for the discharge of treated wastewater to the Pawcatuck River. The limits in the permits for these facilities already equal or exceed 80% of the water quality standards for several pollutant parameters. For Charbert to obtain a permit, RIDEM would need to conduct some form of a waste load allocation process. The waste load allocation process, if successful, might result in the reallocation of some of the discharge capacity already allotted to existing dischargers and assignment of some of that capacity to Charbert. That process could take years, might not be successful and has the potential to be challenged through regulatory and legal processes. Even if successful, the estimated allocation of certain critical parameters to Charbert would be so low the risk of permit violations was determined to be unacceptable.

Charbert reviewed the results of this analysis with RIDEM personnel from the Office of Water Quality, who agreed with Charbert, and recommended that Charbert investigate other options for discharge, such as land application.

5.2 Land Application of Treated Wastewater

Land application of treated wastewater is the most widely used alternative to surface water discharge. There are a variety of options for the land application of wastewater that are commonly used throughout the United States. The options include:

- Deep Well Underground Injection
- Spray Application
- Rapid Infiltration Bed (RIBs)

The results of the evaluation conducted by Charbert on each of these options are presented below.

A. Deep well underground injection involves the construction of large diameter wells. Wastewater is pumped into the wells. Under pressure, the wastewater flows out of the wells into the surrounding subsurface soils. Based on the nature of the soils and bedrock underlying the Charbert site, this option is not viable. The hydraulic conductivity of the site subsurface is not high enough to accept the quantity of wastewater that would be injected through the relatively small area of an underground injection well.

B. Spray application systems are designed to apply wastewater to the ground surface over a large area. Typical application rates in New England are in the range of 1 to 3 inches of water per acre per week. Given the volume of water used at Charbert, a land area of 50 to 75 acres would be required for a spray application system. Though Charbert does own sufficient land in the general vicinity of the plant to use spray application, this option might present substantial challenges because of the proximity of neighboring residences. These include the potential for the spray to drift off site as well as the issue of freezing of spray in cold weather.

C. Rapid infiltration beds (RIBs) is a method of land application that is used where soils and site conditions are suitable. Rapid infiltration beds are used at sites where the surficial soils have high permeability and groundwater is a minimum of 4 to 6 feet below the ground surface. RIBs are constructed by removing the less permeable top soils to expose the more permeable underlying sands and gravels. Design loading rates for RIBs range from 2 to 6 gallons per day per square foot. Preliminary estimate of the area required for RIBs to discharge the treated wastewater generated at Charbert is in the range of 65,000 to 100,000 square feet. Charbert owns sufficient land in the general vicinity of the existing lagoons for construction of RIBs of this size. Charbert therefore decided to undertake a detail investigation of the geology and hydrogeology of the land it owns in the vicinity of the existing lagoons to evaluate the technical feasibility of using RIBs for future disposal of treated wastewater.

During the summer of 2005, Charbert conducted a detailed study of the land area south of the existing lagoons. Numerous test pits were excavated to investigate the geology of the soils around the existing lagoons. Borings were made and piezometers were installed to determine soil stratigraphy and to monitor groundwater levels. Testing was done, with permission from RIDEM, to evaluate the effects of applying all of Charbert's treated wastewater to the land with RIBs. The results of the testing program indicate that the area south and west of the lagoons is large enough for the discharge of flows in excess of 250,000 gallons per day using conventional rapid infiltration beds.

RIDEM indicated during a consultation meeting that if Charbert elects to use a land application system for the discharge of treated wastewater, the groundwater will be required to meet or exceed RIDEM's GA groundwater quality standards. The Rhode Island standards for Class GA groundwater are published in RIDEM's "Rules and Regulations for Groundwater Quality." This regulation states in part:

(a) "Pollutants shall not be in groundwater classified GAA or GA, except within an approved discharge zone or residual zone, in any concentrations which will adversely affect the groundwater as a source of potable water (drinking water) or which will adversely affect other beneficial uses of the groundwater, to include but not be limited to recreational, agricultural and industrial uses ....
(b) The numerical groundwater quality standards and the preventative action limits for specific substances in class GAA and class GA are listed in Table 1."

By the process described above, Charbert concluded that land disposal with RIBs is the only practical option for the disposal of treated wastewater. Charbert proposes to uses land application, specifically rapid infiltration beds, for the disposal of treated wastewater. Given this conclusion, the groundwater must meet the GA standards and the wastewater from Charbert must be treated such that the groundwater will meet these standards.

Following a detailed review of the Rhode Island Class GA groundwater quality standards, Acheron determined that each of the treatment technology options identified in Section 4 of this report have the potential to meet the standards. The next step is to determine which of the potential treatment options will actually meet this standard. This determination is made by conducting pilot scale evaluations of the various options. Pilot scale evaluations are performed by subjecting small quantities of untreated wastewater from Charbert to each of the treatment options. The characteristics of the treated wastewater from the pilot scale testing are compared to the standards to determine which of the options can actually achieve compliance with the standards. The final selection of a treatment technology is based on the results of this evaluation.

Charbert has started to conduct the pilot scale testing of each of the listed treatment technologies. One of the pilot scale studies has been completed and two are in process. The following section describes the results and status of the pilot plant testing program at Charbert.

6.0 Pilot Plant Evaluations

Following a detailed review and evaluation of the information presented above, Charbert decided to conduct pilot scale evaluations of the three treatment options. The goals of the pilot scale evaluations are to:

1. Determine which of the optional treatment technologies can actually meet the discharge standards described in Section 5.
2. Determine the treatability of the Charbert wastewater using the selected treatment technologies.
3. Determine design criteria for a full scale treatment system.
4. Evaluate the level of odors that may be generated by each of the treatment options.
5. Evaluate the characteristics of the treated wastewater from each of the treatment technologies and compare the characteristics of the treated wastewater to the GA groundwater standards.
6. Evaluate the characteristics of any sludge generated by each of the optional treatment technologies.

In April, 2005, Charbert authorized the construction and operation of pilot plants in order to evaluate the options for treating wastewater from the Charbert facility. The following sections contain a description of the status of pilot plant evaluations.

6.1 Physical/Chemical Precipitation Technology

Physical/Chemical Precipitation technology relies on a combination of additives to promote the coagulation and precipitation of non-dissolved suspended particulate material and dissolved ions. This technology can also include physical filtration of the supernatant from the settling process to enhance the removal of non-dissolved components from the treated wastewater.

On May 3 & 4, 2005, Charbert personnel collected composite samples of process wastewater from the pumping station wet well at Charbert. The samples were shipped to Acheron for the evaluation of the potential treatability of the Charbert process wastewater using conventional physical/chemical treatment technology. A variety of inorganic and organic flocculating and coagulating agents were added to the samples at a variety of different concentrations and pH levels. A total of 4 different trials were performed on the samples of the process wastewater. Visual clarity was used to select the best performing combination of chemical additives from each trial. The supernatant (the clear liquid remaining after settling of solids) from the clearest sample in each test series was tested for BOD, COD, TSS, Color, Total Chromium, Total Copper and Total Zinc.

The following tables provide a summary of the test results for two samples evaluated by Acheron. These data represent what appeared to be the best of the supernatant samples obtained from the treatment trials.

Charbert
Results of Physical/Chemical Treatment of Charbert Process Wastewater
Table 1
May 3, 2005

Test Parameter	Untreated Sample	Treatment No. 1	Percent Reduction	Treatment No. 2	Percent Reduction
BOD5	220	159	**28%**	120	**45%**
COD	856	535	**38%**	669	**22%**
TSS	34	88	**-159%**	6	**82%**
Color	240	500	**-108%**	145	**40%**
T. Cr	0.042	0.04	**5%**	0.028	**33%**
T. Cu	0.14	0.028	**80%**	0.046	**67%**
T. Zn	0.038	0.031	**18%**	0.023	**39%**

Charbert
Results of Physical/Chemical Treatment of Charbert Process Wastewater
Table 2
May 4, 2005

Test Parameter	Untreated Sample	Treatment No. 3	Percent Reduction	Treatment No. 4	Percent Reduction
BOD5	251	210	**16%**	216	**14%**
COD	1260	901	**28%**	896	**29%**
TSS	20	37	**-85%**	11	**45%**
Color	2000	1860	**7%**	1790	**11%**
T. Cr	0.028	0.014	**50%**	0.015	**46%**
T. Cu	0.15	0.031	**79%**	0.031	**79%**
T. Zn	0.081	0.015	**81%**	0.015	**81%**

Treatment systems 2 & 4 provided the best percentage reduction of both inorganic and organic parameters. These treatments consisted of different concentrations of a combination of organic and inorganic coagulants and flocculating agents. The average reduction in BOD on these two trials was only about 30% and the average reduction in COD was only 25%. This result is consistent with the fact that most of the BOD and COD in the Charbert wastewater are dissolved and a very small amount of the BOD and COD is associated with the suspended solids in the wastewater.

The reduction in heavy metals concentrations in the treated samples was notable. The pH adjustment combined with the coagulant chemistry used in these experiments resulted in an average chromium reduction of 40%, copper at 73% and zinc at 60%. This reduction is notable given the high ratio of dissolved to total metals concentrations in the untreated samples.

The results from the laboratory scale evaluation of physical/chemical treatment technologies on samples of Charbert process wastewater indicate that physical/chemical treatment is not a viable treatment option. The available data indicates that if wastewater, treated using this technology, were discharge by land application, the groundwater in the vicinity of the disposal area may not meet Rhode Island's class GA standards. In addition, the organic content of the treated wastewater, as measured with the BOD and COD tests, is high enough to have the potential to cause plugging of the soils in the rapid infiltration beds.

6.2 Biological Activated Sludge

On or about April 15, 2005, Charbert commissioned Acheron to construct a large scale biological activated sludge pilot plant. The pilot plant was designed and constructed by Acheron to treat an average daily flow of 300 gallons per day of process wastewater from the pumping station wet well at Charbert. The completed unit was shipped to Charbert on May 31, 2005. The unit was filled, seeded and commenced operations on June 1, 2005.

As of August 15, 2005, the biological activated sludge pilot plant was still being operated at Charbert. The activated sludge pilot plant is working and is treating the wastewater from the Charbert plant but the plant has so far not achieved optimum performance that is typical of most activated sludge treatment plants. Charbert is planning to continue operation of the biological activated sludge pilot plant.

6.3 Aerated Wastewater Treatment Ponds

In August, 2005, Charbert began construction of the aerated wastewater treatment ponds pilot plant. The aerated wastewater treatment ponds pilot plant, when completed, will have a design capacity of approximately 100 gallons per day. The pilot plant is designed to evaluate the potential performance of a long term aerated wastewater treatment ponds system if Charbert were to convert all or a portion of the existing lagoon to a wastewater treatment system. Given that the existing lagoons have a theoretical detention time of 52 days at the average daily flow rate at Charbert, the aerated wastewater treatment ponds pilot plant will need to be operated for a minimum of several months to evaluate the potential performance of this option.

7.0 Management and Disposal of Sludge from Wastewater Treatment

Sludge is generated in a wastewater treatment process. The sludge is the byproduct of all wastewater treatment processes.

In a physical/chemical treatment process, sludge is generated from the introduction of the flocculating and coagulating chemical that causes soluble and insoluble material to be removed from the water. Since the pilot scale evaluation of the physical/chemical treatment process did not attain a level of treatment that was satisfactory to Charbert, there was no evaluation done on the sludge.

Biological wastewater treatment processes also create sludge. Biological wastewater treatment relies on live biological organisms to breakdown and consume the organic material in the wastewater. In that process, the organisms grow and then die. Most of the biological organisms that grow in a biological wastewater treatment facility are removed as waste sludge and the treated water is discharged from the plant. The waste sludge from a biological plant also contains any non-soluble particles that come out of the wastewater with the waste biological organisms.

The most common options in use today for the disposal of sludge from a biological wastewater treatment plant are:

- Reuse and recycle (usually following composting)
- Land disposal
- Landfill

The handling and disposal of sludge from wastewater treatment plants in the State of Rhode Island is regulated by the Rhode Island Department of Environmental Management under the provisions of Regulation 12-190-008 entitled "Rules and Regulations for the Treatment, Disposal, Utilization and Transport of Sewage Sludge". This regulation establishes criteria and procedures for disposal of sludge by land disposal, land application, composting and incineration.

Appendices 6, 7, 8 and 9 of the sludge regulations define maximum concentrations of various contaminants for Class A, B and C biosolids (sludge) from wastewater treatment plants. Laboratory testing of sludge samples is required to determine the classification of sludge from a particular wastewater treatment plant.

Charbert is planning to collect sludge from the biological pilot plant. Samples of the sludge from the pilot plant will be tested for each of the contaminants listed in Appendices 6, 7, 8 and 9 of the above referenced regulation. The results of the tests on sludge from the pilot plant will allow Charbert to determine the classification of sludge that would likely be generated from a full scale wastewater treatment plant. The classification will then determine which of the sludge disposal options are available for sludge from the full scale treatment plant.

Since the work on the biological pilot plant is not complete, Charbert has not been able to obtain samples of sludge for testing. Therefore, Charbert is unable, at this time, to determine the classification of its sludge and consequently is also unable to propose a definitive means of sludge disposal. Once the pilot plant becomes fully operational, samples of sludge will be sent to a laboratory for analysis. Once the analytical results are available, Charbert will be able to define the classification of its sludge and then be able to identify the options available for disposal of sludge from the wastewater treatment system.

8.0 Project Schedule

The following is a tabulation of the schedule that depicts the status for implementation of wastewater treatment at the Charbert facility in Alton, Rhode Island. The critical component of the project is the pilot plant study that is currently ongoing at Charbert. All other components of the schedule are driven, in part by the results of the pilot plant study.

Task Description	**Begin Date**	**End Date**	**Status**
Preliminary Project Planning	Nov., 2002	April, 2004	Complete
Characterization of Process WW	July, 2004		Completed and ongoing
Quantification of Process Flows	Sept., 2004		Completed and ongoing
Pilot Plant Study	April, 2005		Ongoing
Preliminary Design	Dependent on pilot plant		
Permitting	Within 90 days of approval from RIDEM of Proposed Alternative (per Consent Agreement)		
Final Design	Within 90 days of receipt from RIDEM of all necessary approvals and permits (Per Consent Agreement) Construction		

9.0 Summary

In summary, Charbert has been collecting data regarding wastewater volume and characteristics for over a year to support the evaluation of wastewater treatment options. Wastewater treatment options are evaluated by the volume, characteristics and discharge requirements of the treated wastewater.

Charbert conducted an extensive evaluation of the potential for surface water discharge of treated wastewater. The results of this evaluation determined that surface water discharge was not a viable option due to existing discharges to the Pawcatuck River.

Charbert conducted a geologic and hydrogeologic investigation and testing of Charbert's property located south of the existing wastewater lagoons to evaluate the potential to discharge treated wastewater to the ground surface using a series of RIBs. These investigations determined that this portion of the property could receive a minimum of 250,000 gallons per day of treated wastewater. However, the actual discharge option selected will have to be determined after an evaluation of the data gathered from the pilot plant studies being conducted by Charbert.

Charbert also conducted a physical chemical treatment pilot study using wastewater from the facility. This pilot study determined that physical chemical treatment followed by land application was not viable because the groundwater in the vicinity of the disposal area may not meet the Rhode Island GA groundwater standards. This pilot study further demonstrated that the organic content in the treated wastewater is high enough to have a potential to cause plugging of the soils in the RIBs.

In April 2005, Charbert commissioned the construction of a Biological Activated Sludge pilot plant, which commenced operations on June 1, 2005. As of August 15, 2005 the pilot plant was treating the wastewater from the Charbert plant, but has not yet achieved optimum performance that is typical of most activated sludge treatment plants. Charbert is continuing to run the activated sludge plant to determine the optimum performance for a plant of this type treating Charbert's process wastewater.

In late August, Charbert began construction of an aerated wastewater treatment ponds pilot plant to determine the performance of a long term aerated wastewater treatment ponds treatment system. This treatment technology requires an extended operation time to evaluate the potential performance of a treatment option. Therefore, Charbert has elected to start this pilot plant at this time before the results of the Biological Activated Sludge treatment plant are known.