



Division of Public Works .
1000 South Houser St.
Muscatine, IA 52761

Recycling Center and Transfer Station

Phone (563) 263-9689
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MEMORANDUM

To: Mayor and City Council Members
Cc: Greg Jenkins, Interim City Administrator
From: David Popp, Solid Waste/Collection and Drainage Manager
Date: January 30, 2020
Re: Barker Lemar proposal # 175177, Lagoon Monitoring and Pump Control Services

Recycling Center
Transfer Station
Landfill Operations
Refuse Collection

Introduction:

The City owns and operates the Muscatine County Sanitary Landfill. The DNR recently required the site to construct a leachate lagoon to improve leachate management at the site. The City is required to submit a Corrective Measures Report to the DNR by March of 2020. This report addresses three areas of the landfill that have had issues with leachate migration outside of the leachate collection system, or boundary area, and how the City is addressing mitigating these issues.

Background:

The propose of this proposal is to provide an automated leachate pumping system that will control storage tank and lagoon levels to ensure overflows do not occur. Currently, staff will receive an alert by telephone when storage tanks are near full, thus requiring staff to drive out to the landfill after hours to pump the storage tanks to the leachate storage lagoon. The new Smart System will allow staff to monitor pumping and tank levels from a computer or smart phone from any location, while tank levels are controlled with automation.

Recommendation/Rationale:

Staff recommends that the council approve this request for the proposal from Barker Lemar for the leachate automated control system in the amount of \$49,700.00. \$50,000.00 has been budgeted in FY 2020 for this project.

Background Information:

Barker Lemar Engineering Consultants proposal no. 175177



December 28, 2019

David Popp, Solid Waste Manager
City of Muscatine
1000 South Houser Street
Muscatine, Iowa 52761

RE: Proposal: Lagoon Monitoring and Pump Control Services
Muscatine County Landfill
Proposal No. 175177

Dear David:

BARKER LEMAR ENGINEERING CONSULTANTS (BARKER LEMAR) appreciates the opportunity to provide engineering and automation services to the City of Muscatine (Client) at the Muscatine County Landfill (site) in Muscatine, Iowa.

1.0 PROJECT UNDERSTANDING

The site has been managing leachate through the use of two 10,000-gallon storage tanks, equipped with level monitors requiring manual intervention to initiate pumping activities. The East Tank is considered initial storage and the West Tank is utilized when level monitor indicates high leachate levels in the East Tank, prompting the pumping system to pump product from the East to the West Tanks. Tanker trucks are used to haul the leachate from the West Tank to a wastewater treatment facility. This system has been under scrutiny by the Iowa Department of Natural Resources (DNR) for some time and the City has been required to submit a semiannual leachate alarm report to demonstrate compliance with the seven-day storage requirements specified in Chapter 113. The DNR recently required the site to construct a leachate lagoon to improve leachate management at the site.

Leachate management utilizing the newly constructed lagoon employs the existing pumping station to pump leachate to the lagoon and alarms are used to notify staff that the pumps need to be engaged to move leachate to the lagoon. Upon receipt of an alarm, staff are required to drive to the site and manually pump to the lagoon or directly to tanker trucks to keep the tanks from overflowing.

The proposed Smart System will allow for automation of the pumping system. Automation will reduce the mileage, manpower, and inherent risks of tank overflow associated with responses requiring human intervention. In addition, real time monitoring will allow users to view lagoon levels, pump statuses and generate reports directly from a dashboard on a computer in the transfer station, on a cell phone, or any other device with an internet connection from anywhere in the world. Loadout to haul leachate from the tanks or the lagoon will still require manual control.

2.0 SCOPE OF SERVICES

Based on the above and our discussions, we believe the proposed system to be the best option for successfully improving efficiency of the leachate management system and improving leachate monitoring efforts.

This system provides real time data and alarms, as well as the ability to monitor tank levels, lagoon level,

and control pump runtimes. Additionally, this configuration allows for storage of data to monitor trends and provide information critical for leachate control reporting. The alarms would be visible at the monitoring nodes via LED lights. The tanks and lagoons would be equipped with a pressure sensor that would allow leachate levels to be monitored in real time.

In this configuration, the devices/products described below will be purchased, programmed, and installed by BARKER LEMAR. These units consist of the following:

- **Lagoon Monitor**
This device monitors the level of the lagoon using a pressure transducer.
- **Tank Monitors**
These devices - placed in the East and West Tanks - monitor the level of each tank using a pressure transducer.
- **Pump Controllers and Panels (2)**
These devices connect to the pump stations of the East and West Tanks and control the pump on/off signal based on level readings from the tank monitors. A program will be developed with customizable set points for the pumps. In addition, a failsafe program will check the lagoon level prior to engaging a pump to ensure leachate is not pumped to the lagoon when it is near capacity.
- **Solar Repeater**
This device provides a link between the site devices and the base station. Based on the site map, we anticipate that one repeater would be required at the site.
- **SQL Server License, DAQFactory License, Laptop, Initial Satellite Internet, Set-up**
This involves procurement of the laptop, software licensing, and the initial cost for satellite internet installation which provides an internet connection for the other site devices and pushes all data collected by the other devices to the web-based dashboard.
- **Annual Fees for Satellite Internet System**
BARKER LEMAR will maintain satellite internet services and charge client for fees on an annual basis.
- **Web Based Dashboard**
The dashboard will be customized to display all parameters of the system in real time and will be accessible from any device with a web browser and an internet connection. The dashboard will allow control of pumps, monitoring of levels, and review of historical data. Historical data can be utilized to recognize trends or changes within the system and can serve as a tool in identifying potential issues with the leachate system.
- **Annual Hosting, Licensing, Software Updates and Cloud Data Storage**
This includes necessary fees for online data storage, web hosting, and software updates to support the real-time cloud-based system described.

3.0 LIMITATIONS

Services not set forth in section 2.0, scope of services, are excluded from this proposal. BARKER LEMAR has no responsibility to perform such excluded services and has no liability associated with the non-performance of such services. We have based this scope of services on providing the equipment and installation for listed above.

4.0 SCHEDULE

BARKER LEMAR will begin these services subsequent to receiving the signed confirmation of notice to proceed, or the Client's verbal authorization followed by the signed notice to proceed. Barring circumstances beyond BARKER LEMAR's control, BARKER LEMAR anticipates completing the scope of services within 120 days of receipt of signed notice to proceed.

5.0 COMPENSATION

BARKER LEMAR agrees to perform the above scope of services on a lump sum by task basis. Total compensation is estimated at \$ 47,600. The compensation for the proposed scope of services is shown in the Table 1 and is valid for 60 days following the date of this proposal. Although fees are shown by task, the compensation for individual tasks are not independent of each other, and elimination of any task or part of a task shall justify a review and potential adjustment of the compensation for the remaining scope of services. Our invoices will be submitted monthly and will reflect the percentage complete of each task as of the date of the invoice.

**TABLE 1
COMPENSATION TABLE**

SCOPE ITEM	UNITS	QUANTITY	UNIT COST	TOTAL
East Tank Control Panel	Each	1	\$3,250	\$3,350
West Tank Control Panel	Each	1	\$3,400	\$3,500
Lagoon Monitor	Each	1	\$1,800	\$1,800
Remote Level Monitor	Each	1	\$2,100	\$2,200
Solar Repeater	Each	1	\$2,150	\$2,250
Master Antenna	Each	1	\$500	\$700
CU200 Controller	Each	1	\$500	\$600
Pump	Each	1	\$2,600	\$2,800
Misc. Piping, Wiring, Fittings and Equipment	Lump Sum	1	\$1,300	\$1,500
Installation	Lump Sum	1	\$9,500	\$10,000
Dashboard, Programming, and Testing	Lump Sum	1	\$14,500	\$14,500
SQL Server License, DAQ Factory License, Laptop, Satellite Internet, Set-up	Lump Sum*	1	\$6,000	\$6,500
Annual Hosting, Licensing, Software Updates	Per Year**	Annual	\$3,600	
Satellite Internet	Per Year**	Annual	\$1,400	
Total				\$ 49,700

*Note: Includes Satellite Internet Services, Hosting Services and Support through December 31, 2019.

**Note: Annual fees beginning January 1, 2020 for Satellite Internet Services, Hosting and Support

Payment terms are as described in the attached Terms and Conditions. Should conditions be encountered that require a change in the scope of services, compensation, or schedule, BARKER LEMAR will contact Client and proceed only with Client authorization and a signed contract.

6.0 HEALTH AND SAFETY

This proposal assumes that Level D safety precautions are adequate. Level D safety attire generally consists of a normal work uniform including safety shoes, hard-hat where required, and appropriate eye protection. The costs will be adjusted accordingly if site-specific conditions require more stringent health and safety procedures.

7.0 CONDITIONS

Items to be provided by the Client include the right-of-entry for fieldwork as outlined in this proposal. The Client is responsible for making BARKER LEMAR aware of any restrictions or special requirements regarding the site and its required activities prior to the commencement of the fieldwork. We have enclosed our Terms and Conditions that should be considered part of this proposal.

CONFIRMATION OF NOTICE TO PROCEED

Proposal No. 175177

The above Proposal and attached Terms and Conditions are understood and accepted.

BARKER LEMAR agrees to perform and complete the following services for the Client at its facilities located near Muscatine, Iowa.

The scope of services is described as Lagoon Monitoring and Pump Control Services will include other technical and/or administrative services as outlined in this proposal.

BARKER LEMAR agrees to perform the above scope of services for an estimated compensation of \$47,600. Client will be invoiced for the percent of each task completed at the time of the invoice. The compensation for the proposed scope of services is valid for 60 days following the date of this proposal.

If this proposal meets with your approval, sign two originals of this confirmation of notice to proceed, retain one original for Client files, and return one original or copy via email, fax to 515.256.0572, or U.S. mail to BARKER LEMAR Engineering Consultants, 1801 Industrial Circle, West Des Moines, IA 50265.

If you have questions regarding any of the information above please contact us at 515.256.8814.

BARKER LEMAR ENGINEERING CONSULTANTS

MUSCATINE COUNTY SOLID WASTE MANAGEMENT AGENCY

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