

**Flint Water Advisory Task Force Questions
to
Lockwood, Andrews and Newnam ("LAN")**

February 22, 2016

(Received by LAN on March 1, 2016)

- 1. Please describe your firm's experience with drinking water treatment facilities, specifically related to drinking water quality, treatment of river water supply, disinfection and disinfection byproduct management, corrosion control, and startup for full-time operation.**

Answer: As related to LAN's work with the City of Flint, a representative description of the company's experience can be found in its June 10, 2013 Scope of Services and Fee Proposal to the City, a copy of which will be provided.

- 2. Please describe your firm's experience with distribution system management, including corrosion control, disinfection and DBP management, and Legionella management.**

Answer: LAN is familiar with the general principles of Legionella, but has been unable to identify a project where Legionella management was a specific focus of concern. For all other topics, see the description of the company's experience in its June 10, 2013 Scope of Services and Fee Proposal to the City, referenced in answer to Question 1 above.

- 3. Please provide the scope of work for your engagements related to preparing the Flint Water Treatment Plant for full-time operation, as well as any subsequent engagements.**

Answer: Prior to LAN's being contacted by the City of Flint in May of 2013, the City had already had substantive discussions regarding the Flint Water Treatment Plant (FWTP) with the Emergency Manager, the Department of Treasury and the MDEQ. At LAN's first meeting with the City regarding the FWTP on May 22, 2013, the City mentioned that it had already talked with the MDEQ regarding what would be required to allow the City to operate the FWTP.

The actual tasks and scope of work of LAN are set forth in the public contracts between the City and LAN, specifically Contract 13-046 (issued by the City on June 26, 2013), as amended by subsequent change orders. All of these contract documents are being provided and are summarized below. LAN was directed by the City to address specific components of the existing FWTP, and LAN did not have responsibility for overall water quality.

Under the original Contract 13-046, LAN's scope of service was limited to an initial study and assessment of the operability of the existing FWTP. This initial study and assessment was never completed, because the City issued Change Order #2 (discussed below) directing LAN to perform specific tasks related to specific components of the plant instead.

In November 2013, the City issued Change Order #2 (Contract 13-046B) which amended the original Contract by asking LAN to provide design work, construction engineering and necessary regulatory submittals for specific components of the plant. LAN's services under CO #2 were limited to and focused on nitrogen and oxygen storage facilities for the ozone system, electrical substation upgrades and a new pump station switch gear, mid-point chlorination improvements, the addition of a new pump in Pump Station No. 4, raw water piping connections at Pump Station No. 4, and a lime residuals disposal plan. The systems on which LAN provided services are operating without issue.

From November 2013 until the FWTP became operational in April 2014, the City continued to limit LAN's scope of services to specific design projects at the FWTP. The City did not provide data related to, nor did it ask LAN to assess, the operations of the FWTP or water quality. Decisions concerning water treatment plant operations and water quality were made by the City and MDEQ, not by LAN.

In October 2014, six months after the FWTP went into operation using water from the Flint River, the City issued Change Order #3 (also labeled Contract 13-046B) for LAN to perform additional design and testing services, as well as reporting to the City, primarily focused on problems with trihalomethane (THM) formation (discussed below).

In April 2015, the City issued Change Order #4 (Contract 13-046D) for LAN to provide design, procurement, permitting and construction implementation services for upgrading the filters at the FWTP with new sand and GAC filter media. This project implemented certain recommendations for THM control made by Veolia, the operations consultant engaged by the City of Flint in early 2015.

In December 2015, the City issued Change Order #5 for LAN to design a phosphate feed system. In addition, CO #5 requested that LAN provide design services related to specific tasks needed for the KWA connection.

LAN continues to assist the City as requested as the City addresses its various water system needs.

4. Please describe the procurement processes used for contracting these scopes of service. Please provide copies of relevant proposals and contracts.

Answer: While the details of each contract for professional services may differ, the general procedure was for LAN to submit upon the City's request a scope of services and fee proposal for the particular project identified and described by the City. Once the details of the project and LAN's scope of services were finalized, the City would approve the project; the parties would sign a contract; LAN would perform the work; and the City would pay for the work performed. Sometimes, the contract would take the form of a change order to an existing contract. Other times, the City would request services that came within the overall

scope of an existing contract, so it would be handled by purchase order and invoice instead of a change order. Copies of the contracts related to the FWTP are being provided.

5. Please provide a narrative describing LAN's involvement with City of Flint and MDEQ staff throughout your engagement with the City related to full-time operation of the Flint Water Treatment Plant.

Answer: LAN had no authority or responsibility for the operation of the FWTP, which was an activity undertaken by the City. LAN was not involved with the City or MDEQ staff except as necessary for the specific services for which LAN was contracted (described above). LAN would meet with the City and (if appropriate) MDEQ in scheduled project meetings or as requested and provide documentation required to implement whatever contracted services were being performed. At the City's request, and as part of its services under Change Order #4, LAN began preparing a weekly status report concerning the operation of the FWTP in April 2015 which were focused on the THM issue. The City did not engage LAN's services prior to May 2013, and LAN was not involved in any prior meetings between the City, the Emergency Manager, the MDEQ, the Michigan Department of Treasury or other parties in deciding to switch to the Flint River as a water source.

6. Please provide a list of your findings and recommendations to address the various water quality problems that occurred following startup of full-time operation of the Flint Water Treatment Plant.

Answer: Between the time the FWTP became operational in April 2014 and the time the City switched back to the Detroit Water and Sewage Department (DWSD) as its water source in October 2015, the only water quality problem LAN was engaged to study involved the formation of THM. This work was done under Change Order #3 discussed above. LAN's findings and recommendations are contained in its Operational Evaluation Report on "Trihalomethane Formation Concern" prepared in February 2015, as updated in May 2015 and August 2015, and as might be covered in weekly status reports referenced in answer to Question 5 above. Change Order #5, referenced above, occurred after the switch back to the DWSD water source and was principally focused on addition of a phosphate feed system (but LAN and the City began discussing the work ultimately performed under Change Order #5 in September 2015) .

7. Please provide your subjective assessment of the condition and technologies at the Flint Water Treatment Plant and distribution system prior to full-time operation of the plant.

Answer: LAN's assessments of the FWTP and distribution system can best be described and determined from the work performed under contract with the City. As a general statement, however, the FWTP was in poor operating condition due to a prolonged lack of maintenance as of the summer of 2013. LAN identified particular problems and recommended solutions at that time as part of its services under Contract 13-046 and Change Order #2. LAN recommended that the FWTP be operated on a test run basis for

60-90 days before it became operational in order to assess water quality after treatment. To LAN's knowledge, the recommended test run never took place.

8. Please identify all team members (including LAN staff and any subconsultants) who worked on the project to prepare the Flint Water Treatment Plant for full-time operation. Describe their respective roles on the project and their experience. If any other staff or consultants were engaged for guidance or review, please include those individuals as well.

Answer: LAN's project director was J. Warren Green, PE. His primary assistants were Samir F. Matta, PE, Jeffrey R. Hansen, PE and Jeremy N. Nakashima, PE. See the professional biographies attached to the June 10, 2013 Scope of Services and Fee Proposal submitted by LAN to the City of Flint for a description of their experience, as well as the identities of other professionals who worked on the project. Rowe Professional Services was a subconsultant to LAN under Contract 13-046.

9. Please describe the reporting structure (both LAN's project team reporting structure and its reporting relationship to City of Flint staff and Emergency Manager) for LAN's work on the Flint Water Treatment Plant, specifically for preparations for full-time operation of the plant.

Answer: While all LAN project personnel ultimately reported to Warren Green as project director, his direct reports came from Mr. Matta, Mr. Hansen and Mr. Nakashima. Mr. Green reported to and most commonly had direct contact with Duffy Johnson, Brent Wright, and Mike Glasgow, although he periodically met with other City officials. Mr. Matta, Mr. Hansen and Mr. Nakashima were able to and did have direct contact with their counterparts at the City as warranted by the needs of the project.

10. Please provide a copy of any deliverables prepared to support full-time operation of the Flint Water Treatment Plant, including the plan of treatment that was reviewed with MDEQ.

Answer: LAN's deliverables consisted of drawings, plans and specifications, reports and associated documents for the specific items within LAN's scope of services under Contract 13-046 and subsequent change orders. Copies will be provided.

LAN is not sure what "plan of treatment [document] that was reviewed with MDEQ" is being referenced in this question, but notes that a plan of treatment was not one of LAN's deliverables under the contract.

11. Please review your discussions with the City of Flint utility staff and MDEQ regarding Flint River water chemistry and treatment requirements, specifically relating to:

- a. Anticipated treatment challenges related to use of Flint River
- b. Prospective disinfection requirements and options for management of DBPs

c. **Corrosion control**

Answer: See answers to Questions 12 – 16 below. (Note: this is not meant to exclude any technical discussions related to some of these points (primarily treatment challenges, disinfection requirements and DBPs) that could have arisen in connection with the specifics of work performed under Contract 13-046 and subsequent change orders).

12. Please describe the decision-making processes related to treatment requirements, specifically with regard to corrosion control treatment.

Answer: The City and MDEQ made all decisions related to treatment requirements, including corrosion control treatment. LAN had no authority or responsibility to make such decisions. In LAN's discussions with the City concerning corrosion control, the City informed LAN that it was not going to implement corrosion control or full water softening, because neither was required by the MDEQ. (discussed further in Question 13).

13. What was the nature of the discussions regarding Lead and Copper Rule compliance requirements?

Answer: In July 2011, LAN, acting as subconsultant to Rowe Professional Consultants, prepared a Cost of Service Study technical memorandum, which addressed LCR compliance. The Cost of Service Study (attached as Appendix 8 to Rowe's July 2011 report "Analysis of the Flint River as a Permanent Water Supply for the City of Flint") made provision for full water softening (lime and soda ash) and LCR testing and compliance, including corrosion controls.

LAN recommended full water softening in a draft Scope of Services presented to and discussed with the City (including the Emergency Manager) in May 2013. At that time, the City informed LAN that the City would not use full water softening because MDEQ was not requiring it.

LAN had no responsibility or authority for LCR compliance under Contract 13-046 or any of its change orders, a point made clear during meetings with the City and MDEQ in May and June 2013. As already noted, LAN participated in meetings with the City in May 2013 where the City advised that MDEQ was only going to require partial water softening. LAN also met with the City, MDEQ and others in June 2013 where the City and MDEQ discussed how the City would comply with or implement the LCR. The MDEQ approved the City's plan for partial water softening and stated the City did not need to implement corrosion control and could comply with the LCR by conducting two six-month monitoring surveys during the first year of operation of the FWTP, after which any needs for corrosion control would be assessed. Immediately following the June 2013 meeting with the City and the MDEQ, LAN asked the City to revisit the issue of corrosion control but the City indicated that it was not going to do anything beyond what was required by the MDEQ.

In the meetings with the City in May of 2013 and with the City and the MDEQ in June of 2013, the participants discussed plans to operate the FWTP on a test run basis for 60-90 days before beginning full-time operation. Again, to LAN's knowledge, the recommended test run never took place.

14. Did LAN identify requirements for Lead and Copper Rule compliance in advance of discussions with MDEQ?

Answer: See answer to Question 13 above.

15. Did LAN express any concerns or cautions with respect to MDEQ's interpretation of Lead and Copper Rule requirements for water treatment?

Answer: See answer to Question 13 above. In the meeting in June 2013, LAN asked the basis for MDEQ's directions on LCR compliance, which MDEQ provided. Immediately following that meeting, LAN discussed and questioned this issue again with the City. The City responded that it was going to do no more than MDEQ required.

16. What were the outcomes of discussions with MDEQ regarding treatment requirements, specifically regarding compliance with Lead and Copper Rule requirements?

Answer: See answer to Questions 12 - 15 above. The City followed MDEQ's directions about conducting two six-month monitoring surveys and not installing corrosion controls at the time the FWTP became operational in April 2014.

In early September of 2015, the City approached LAN regarding designing a phosphate feed system for corrosion control, and at that time LAN began the work which was incorporated into CO #5.

17. Please outline your interactions with other consultants and suppliers working on the Flint Water Treatment Plant, both during preparation for and after startup of full-time operation, including Rowe Professional Consultants, Veolia and any others.

Answer: In 2011, LAN was a subconsultant to Rowe Professional Consultants for preparation of Rowe's July 2011 report "Analysis of the Flint River as a Permanent Water Supply for the City of Flint," as described in answer to Question 13 above.

In 2013, Rowe Professional Consultants was a subconsultant to LAN under Contract 13-046, discussed above, primarily for site surveying and permitting services and design of a mid-point chlorine feed system.

The City contracted directly with Veolia for services relating to THM formation in 2015. The City contracted directly with LAN to implement Veolia's recommendations for upgrading the FWTP's filters with new GAC media (see Change Order #4 discussed above).

LAN and Veolia shared information related to the THM projects, but had no direct contractual relationships with each other.

In performing its contracts with the City, LAN worked with parts and equipment suppliers, *e.g.*, Calgon Carbon Corp., which provided the GAC filter media, and with various electrical gear and pump suppliers. The number of parts and equipment suppliers used by LAN throughout the course of its work on the FWTP are very numerous, but can be identified and documented through contracts and/or financial records submitted to the City.

18. Please describe LAN's involvement with the City of Flint's Technical Advisory Committee. Please provide copies of any presentations or handouts offered in the context of the Technical Advisory Committee discussions.

Answer: LAN was not a member of the City's Technical Advisory Committee, but Warren Green was copied on many email communications and LAN attended some meetings at the invitation or request of the Committee. LAN has found no copies of presentations or handouts distributed at Committee meetings and believes it did not make any.

19. Please describe LAN's involvement with the City of Flint's preparation to utilize Lake Huron water from KWA and work on the Flint Water Treatment Plant. Please provide copies of any documents, treatment plans and progress reports on getting the plant ready to properly treat KWA supplied water.

Answer: LAN works on specific tasks related to the KWA under contract to the City of Flint. Examples of projects completed or in progress include designs of yard piping and interconnect piping, an electrical substation, electrical switch gear, the addition of one pump, and a filter transfer pump station. LAN has done a study/report on connecting pipe systems and has been asked to perform a limited treatability study on coagulants. Copies of documents on completed projects will be provided.

20. Please offer any key points or information not already provided that you think would be of value in addressing the causes of the Flint water crisis and avoiding similar situations in the future. Please provide any recommendations to address prospective Flint water system needs.

Answer: LAN respectfully considers this question too broad and general to allow it to respond in a meaningful way. LAN continues to assist the City as requested as the City addresses its various water system needs.

Documents Being Produced at the Request of Governor's Flint Water Advisory Task Force

July 2011 Report entitled "Analysis of the Flint River as a Permanent Water Supply for the City of Flint" prepared by Rowe Engineering (and LAN as a subconsultant to Rowe)

May 27, 2013 Draft Scope of Services prepared by Warren Green at the request of the City of Flint

June 26, 2013 Contract 13-046, with Change Orders #2-#5, attached June 10, 2013 proposal from LAN and related contract documents

November 2014 Draft report regarding "Trihalomethane Formation Concern" prepared by LAN

February 27, 2015 Final report regarding "Trihalomethane Formation Concern" prepared by LAN

May 29, 2015 Final report regarding "Trihalomethane Formation Concern" prepared by LAN

August 27, 2015 Final report regarding "Trihalomethane Formation Concern" prepared by LAN

To be produced--All "deliverables" prepared by LAN in connection with the Flint Water Treatment Plant

To be produced--Documents prepared by LAN in connection with the planned connection of the Flint Water Treatment Plant to the KWA water source

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