Progress Report

July 2018

Installation, Operation, and Maintenance of ERH at Third Site

985 South US Highway 421
Zionsville, Indiana

Summary

This progress report has been prepared by McMillan-McGee Corporation (Mc²) on behalf of the Third Site Trust Fund (TSTF) pursuant to the Administrative Order by Consent (the order) for Third Site, located in Zionsville, Indiana (the Site). The revised Order approving Electrical Resistive Heating (ERH) groundwater remediation became effective on December 16, 2016. This monthly progress report includes activities conducted during the month of July 2018.

1. Activities Completed During Reporting Month

- The electrical contractor, West Electric, was on site on July 2, 10, and 30 to perform electrical connections for the ERH equipment. West Electric will continue electrical work when the remaining equipment is in place, electrical permits approved, and assembly of the MK Environmental (MK) treatment system proceeds.
- Imperial Fence was on site on July 5 and 6 to install chain link material on the fence posts. They returned to site from July 10 to 13 to install cross members and barb wire.
- On July 6, IWM Consulting Group (IWM) laborers performed wellfield construction tasks. This included:
  - Connection of water supply hoses to ERH water circulation systems.
  - Installation of CAT5 network communication cable to temperature sensor Optical Data Acquisition (ODAQ) panel.
- On July 10, Hoosier Equipment Services (Hoosier) transferred the wet silt in tank A5557 to the sludge boxes using a vacuum truck operated by Badger Daylighting. Wastewater from tank A3843 was transferred to tank A5557. This was done so tank A3843 could be moved from the back of the site on July 13.
- On July 12 a transport truck removed the soil roll-off bin from site to be disposed by US Ecology. This hazardous waste consisted of dry soil generated during the drilling program. Another roll-off truck relocated the three sludge boxes on site to allow crane access for placement of MK equipment.
- On July 13, MK and R.H. Marlin Crane were on site for final placement of above ground treatment system equipment. This was coordinated with a transport from Adler so tank A3843 was moved to the front of the site.
- On July 14, an IWM laborer and Mc² began installation of the fence security system and performed housekeeping tasks at the site.
- On July 14, Mc² demobilized from site pending decontamination and removal of wastewater tank A3843, and State review of the ERH electrical design required for electrical permit approval.
- Mc² returned to site on July 30 for waste management activity. Hoosier decontaminated tank A3843 and the tank was returned to Adler that day.
- Imperial Fence completed the fence enclosing Bankert Pond on July 31. Mc² resumed installation of the security system on the fence.

2. Data Generated During Reporting Month

No data were generated from site activities in July.

3. Developments/Difficulties Encountered During the Reporting Month

On June 27, during application for an electrical permit for the ERH installation with the Town of Zionsville, West Electric determined that a Construction Design Release (CDR) may be required from the State of Indiana. After discussion with the State on July 2, it was indicated that adding an equipment anchoring plan to the electrical permit package would likely be adequate to meet CDR requirements for the ERH system. The electrical design package was submitted on July 9 for review by the State. It was indicated that the review is normally a two-week process. On July 24, the State indicated further information was needed for the electrical permit application. Additional information, including an additional form, detailed project description, and revised project figures was submitted to the state inspector on August 6th. On August 8th, the state inspector requested a revised project description, and information regarding the equipment enclosures. Mc² is arranging a call with the state inspector to better understand his information requests. Mc² informed IDEM personnel (Doug Petroff) of permitting developments on July 23rd and IDEM and USEPA personnel (Doug Petroff and Matt Ohl) on August 7th.

It is expected permit approval will be delayed until mid-August. Assembly of the treatment system will not be scheduled until there is more certainty with the electrical permitting.

Hoosier could not be scheduled to decontaminate tank A3843 until July 30. This introduced a delay in construction as the tank remained on the site in front of the MK treatment system and impeded assembly of some treatment components. This tank also had to be moved for U.S. Ecology to remove the sludge boxes and transport them to the treatment facility for waste disposal.

On July 3 it was determined that temperature sensor wells T-C1, T-B4, and T-E1 contained up to 9 ft of suspected grout material at the bottom of the wells. The source of this material is unknown. Mc² will attempt to clean out the wells when the wellfield is accessible with water and electrical power available.

4. Activities Anticipated for Next Reporting Month

- Three sludge boxes remain on site containing wet silt removed from the drilling wastewater tanks. These will be transported off site for disposal in early August.
- Mc² and subcontractors will complete assembly of the ERH wellfield and connection of ERH and treatment equipment in preparation for the commissioning phase of the project.
- Mc² and West Electric will obtain electrical permit approval. After the ERH system passes electrical inspection, Duke Energy will energize the power supply for Mc² and MK commissioning activities.
- Imperial Fence will install temporary fencing around the ERH wellfield and ERH remediation equipment.
- Mc² will install and commission the security system on the Bankert pond fence prior to ERH startup.

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- Mc^2 and MK will commission the ERH and aboveground treatment systems, train the operators, and begin ERH operations.

Progress Report

September 2018

Installation, Operation, and Maintenance of ERH at Third Site

985 South US Highway 421
Zionsville, Indiana

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Summary

This progress report has been prepared by McMillan-McGee Corporation (Mc²) on behalf of the Third Site Trust Fund (TSTF) pursuant to the Administrative Order by Consent (the order) for Third Site, located in Zionsville, Indiana (the Site). The revised Order approving Electrical Resistive Heating (ERH) groundwater remediation became effective on December 16, 2016. This monthly progress report includes activities conducted during the month of September 2018.

1. Activities Completed During Reporting Month

- MK Environmental (MK) was on site from September 1 to 12 to complete construction of the above ground treatment system. Mc² was present to oversee this work.
- On September 1, Mc² placed remaining communication cables for the ERH system data network.
- From September 3 to 20, Mc² placed heat trace and installed insulation to winterize the electrode water injection hoses in the wellfield. IWM Consulting Group (IWM) assisted with this work from September 15 to 20.
- On September 12, the Town of Zionsville performed electrical inspection of the ERH system and approved energization from the utility. The electrical permit did not allow for electrical power to the office unit. Duke Energy energized the power feed to the ERH system on September 13.
- From September 13 to 21, MK trained the IWM operators on operation of the above ground treatment system and commissioned the treatment equipment.
- Mc² performed commissioning of the ERH system from September 14 to 24. The ERH system data network was reconfigured as electrical power could not be provided to the office trailer. IWM assisted with this work from September 20 to to 24.
- West Electric was onsite on September 13, 14, 17 and 21 to support power up of ERH equipment, terminate heat trace for electrode water injection hoses, complete the ERH system data network, and install the fence security system.
- IWM was trained on operation of ERH equipment on September 24 and 25. Mc² completed the operations hand off and left the site on September 25.
- Startup of ERH operations occurred in the afternoon of September 24.
- MK was on site on September 28 to address maintenance issues identified with treatment equipment. It was determined the T-219 holding tank required a replacement lid, although replacement could wait until the part arrived. This part was placed on order.

2. Data Generated During Reporting Month

- On September 16 and 20, Mc² obtained treated water samples from the 10,000 gallon treated water holding tank, for leftover wastewater from the drilling effort and the first batch of well field water, respectively. These samples were analyzed by Pace Laboratories (Pace) for discharge to the ERH wellfield and to Finley Creek for system commissioning and start up activities. Lab results for the two sample dates were obtained on September 18 and 21, respectively. Lab results and pH readings were within National Pollutant Discharge Elimination System permit-equivalency limitations.
- On September 20, Mc² obtained quality control measurements of electrode current readings.
- On September 21 and 24, Mc² obtain step and touch voltage potential measurements of wellfield infrastructure prior to ERH start up.
- On September 25, Mc² obtained baseline vapor and liquid samples from the treatment system for analysis by Pace. Lab results are expected on October 3.
- On September 24, Mc² began generating data per the project requirements defined in the Sampling and Analysis Plan. The data requirements for ERH operations are summarized in the following table:

Item	Media	Location	Method	Frequency
Power, current, voltage	Subsurface	Electrodes	PDS (automatic)	Minutely (averaged daily)
Temperature	Subsurface	Sensor wells	OptiTAM™ (automatic)	Hourly (averaged daily)
Temperature	Extracted fluids	Extraction wells, treatment system	Temperature gauge or gun (manual)	Daily
Vacuum	Vapor extracted	Vacuum Monitoring/ Extraction wells	Vacuum gauge (manual)	Daily
Level	Groundwater	Extraction and monitoring wells	Water Level Interface Probe	Weekly
Flow Rate	Vapor extracted	Treatment influent	Averaging pitot tube (manual)	Daily
Flow Rate	Vapor discharged	Treatment effluent	Averaging pitot tube (manual)	Daily
Flow Rate	Vapor extracted	Extraction wells	Averaging pitot tube (manual)	Biweekly
Volume	Water extracted	Treatment influent	Flow totalizer (manual)	Daily
Volume	Water discharged	Treatment effluent	Flow totalizer (manual)	Daily

Volume	Water injected	Treatment reinjection	Flow totalizer (manual)	Daily
Volume	Water injected	Electrodes	WCS (automatic)	Hourly (averaged daily)
Vapor VOCs	Vapor extracted	Extraction wells	PID (manual)	Biweekly
Vapor VOCs	Vapors treated	Treatment system	PID (manual)	Daily
Vapor VOCs	Vapor discharged	Treatment effluent	PID (manual)	Daily
Vapor VOCs[1] (Analytical)	Vapors treated	Selected treatment system sample ports	USEPA TO-15 modified (Tedlar bag) (manual)	Biweekly
Liquid VOCs[1] (Analytical)	Liquids treated	Selected treatment system sample ports	USEPA 8260B Pump or valve (manual)	Biweekly

3. Developments/Difficulties Encountered During the Reporting Month

As reported in the previous reports, during application for an electrical permit for the ERH installation with the Town of Zionsville, West Electric determined that a Construction Design Release (CDR) may be required from the State of Indiana, Department of Homeland Security (IDHS) Building Division. After discussions with IDHS, it was indicated that adding an equipment anchoring plan to the electrical permit package would likely be adequate to meet CDR requirements for the ERH system. The electrical design package was submitted in early July for review by IDHS. It was indicated that the review is normally a two-week process. On July 24, IDHS indicated further information was needed for the electrical permit application to proceed.

Additional information requested by IDHS, including an additional form, detailed project description, and revised project figures was submitted to the state inspector on August 6. On August 8, the State reviewer requested a revised project description, and information regarding the equipment enclosures. Mc^2 had a call with the State reviewer on August 9. Upon clarifications of the purpose, design, and operation of the ERH system, the inspector believed that the CDR could be waived, or not require review of the detailed design. The inspector requested Mc^2 send an e-mail to the CDR department head, providing the clarifications in writing that were discussed. This e-mail was sent on August 10.

Although final construction of the MK treatment system was not possible without electrical power, MK was mobilized to the site on August 22 to complete assembly of their system to the extent practicable.

On August 21, Mc^2 had a call with both the IDHS department head and a senior plan reviewer, who insisted that a CDR would require the manufacturer of Industrialized Modular Systems to be registered as such in the State of Indiana. Mc^2 subsequently provided supporting information that the ERH installation does not have this requirement and is likely exempt from CDR. On August 29, Mc^2 received an email from IDHS describing the requirements to become an Indiana registered building manufacturer and obtain CDR approval for use of Industrialized Building Systems. In a phone call with Matthew Prost of

IDHS that afternoon, it was confirmed that the seven equipment enclosures for the remediation processes are exempt from requiring a CDR, and only the office/storage unit rented from Mobile Mini Inc required CDR approval for the electrical permit. On September 5, 2018, Mc² determined that Mobile Mini cannot supply the information required by IDHS; accordingly, Mc² determined to leave the office/storage unit unpowered to allow the electrical permitting process to proceed, given the acknowledgement from IDHS that their review is no longer necessary for equipment other than the Mobile Mini unit.

On September 10, USEPA received acknowledgment from IDHS that a CDR would not be required for ERH equipment that will be used entirely for a remedial action performed on Third Site. This in turn allowed inspection and permit approval from the Town of Zionsville electrical inspector, which occurred on September 12. Duke Energy energized the utility feed to the ERH and treatment equipment on September 13 so that Mc² and MK could proceed with commissioning the system.

4. Activities Anticipated for Next Reporting Month

- Mc² will continue the heating phase of ERH operations, with IWM performing onsite operations.
- West Electric will finish terminating and commissioning heat trace for the ERH water injection system in preparation for Fall weather.
- IWM will purge debris from temperature monitoring wells T-B4, TC1, and T-E1 so the temperature sensors can be placed at the correct depths.

Progress Report

October 2018

Installation, Operation, and Maintenance of ERH at Third Site

985 South US Highway 421
Zionsville, Indiana

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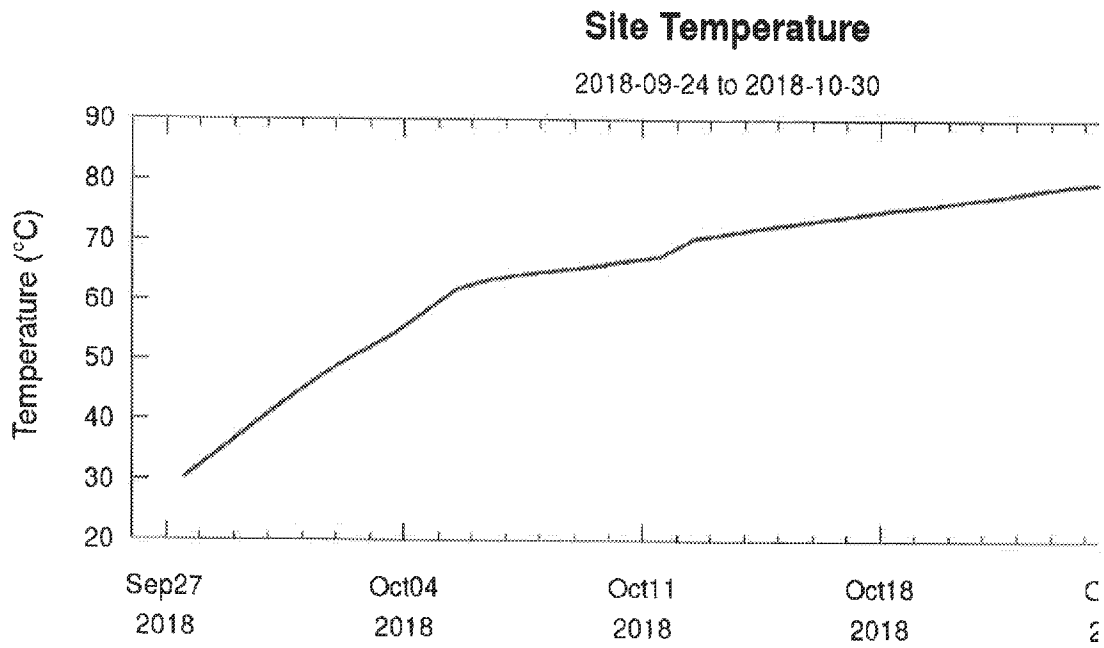
Summary

This progress report has been prepared by McMillan-McGee Corporation (Mc²) on behalf of the Third Site Trust Fund (TSTF) pursuant to the Administrative Order by Consent (the order) for Third Site, located in Zionsville, Indiana (the Site). The revised Order approving Electrical Resistive Heating (ERH) groundwater remediation became effective on December 16, 2016. The Electro-Thermal Dynamic Stripping Process (ET-DSP™) is Mc²'s patented thermal remediation technology employed for this project. This monthly progress report includes activities conducted during the month of October 2018.

1. Activities Completed During Reporting Month

ET-DSP™ and above ground treatment operations continued during the month of October. IWM Consulting (IWM) operators provided on-site support during regular business hours and were on call to respond to alarm conditions during off hours.

The overall heating rate of the treatment volume is ahead of the expected ET-DSP™ performance for the site. The average subsurface temperature is plotted in the following figure, based on measured temperatures at the OptiTAM© sensor wells and temperatures estimated at the electrodes from electrical energy inputs.



The following activities occurred during the reporting period:

- Mc² was on site on October 1 to troubleshoot the fence security system, security camera and OptiTAM© temperature sensors.
- On October 2 and 3, operators used an air compressor to remove debris from the temperature sensor wells.

- On October 3, voltage tap changes were performed at the Power Delivery System (PDS) units to optimize power to the ET-DSP™ electrodes.
- On October 5 and 6, operators provided on-site support to finish troubleshooting the OptiTAM© temperature sensors.
- Mc² was on site on October 6 to complete troubleshooting the fence security system.
- On October 9, operators obtained liquid and vapor samples from the treatment stream for laboratory analysis.
- The electrical steam generator for regenerating carbon vessels in the vapor treatment stream malfunctioned on October 11. This caused power loss to the site when the main breaker tripped. Mc² went to the site at this time to ensure power was safely restored to site with the steam generator power locked out. West Electric was onsite on October 12 and 15 to investigate the steam generator failure and perform repairs. With support from MK Environmental (MK), on October 16 and 17, it was determined that the heating elements in the steam generator had failed, preventing its operation. MK sent replacement heating elements to the site.
- West Electric finished installation and commissioning of electric heat trace for the ET-DSP™ electrode injection hoses in the wellfield on October 12.
- On October 12, voltage tap changes were performed at the PDS units.
- On October 19, replacement heating elements for the steam generator were received and installed. On October 22, MK was on site and ensured the steam generator was functioning properly to regenerate the vapor carbon vessels.
- On October 24, operators obtained liquid and vapor samples in the treatment stream for laboratory analysis.
- On October 26 and 31, voltage tap changes were performed at the PDS units.
- During the tap change on October 31, it was found that a tap connection had overheated and failed on transformer of the 60 electrode PDS (PDS08). The transformer was disabled, preventing operation of 27 electrodes in the middle and shallow depths of the DNAPL containment area. A replacement bar connector is arrived at the site on November 1 to bring the transformer back online.

2. Data Generated During Reporting Month

- On October 9, Mc² obtained vapor and liquid samples from the treatment system for analysis by Pace Laboratories. Lab results were received on October 18 and 19. Vapor and liquid discharge contaminant concentrations were within regulator requirements. Vapor and liquid samples were also obtained on October 24 for analysis, with lab results expected to be received on November 1.
- Mc² continued generating data per the project requirements defined in the Sampling and Analysis Plan. The data requirements for thermal remediation operations are summarized in the following table:

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Item	Media	Location	Method	Frequency
Power, current, voltage	Subsurface	Electrodes	PDS (automatic)	Minutely (averaged daily)
Temperature	Subsurface	Sensor wells	OptiTAM© (automatic)	Hourly (averaged daily)
Temperature	Extracted fluids	Extraction wells, treatment system	Temperature gauge or gun (manual)	Daily
Vacuum	Vapor extracted	Vacuum Monitoring/ Extraction wells	Vacuum gauge (manual)	Daily
Level	Groundwater	Extraction and monitoring wells	Water Level Interface Probe	Weekly
Flow Rate	Vapor extracted	Treatment influent	Averaging pitot tube (manual)	Daily
Flow Rate	Vapor discharged	Treatment effluent	Averaging pitot tube (manual)	Daily
Flow Rate	Vapor extracted	Extraction wells	Averaging pitot tube (manual)	Biweekly
Volume	Water extracted	Treatment influent	Flow totalizer (manual)	Daily
Volume	Water discharged	Treatment effluent	Flow totalizer (manual)	Daily
Volume	Water injected	Treatment reinjection	Flow totalizer (manual)	Daily
Volume	Water injected	Electrodes	WCS (automatic)	Hourly (averaged daily)
Vapor VOCs	Vapor extracted	Extraction wells	PID (manual)	Biweekly
Vapor VOCs	Vapors treated	Treatment system	PID (manual)	Daily
Vapor VOCs	Vapor discharged	Treatment effluent	PID (manual)	Daily
Vapor VOCs[1] (Analytical)	Vapors treated	Selected treatment system sample ports	USEPA TO-15 modified (Tedlar bag) (manual)	Biweekly
Liquid VOCs[1] (Analytical)	Liquids treated	Selected treatment system sample ports	USEPA 8260B Pump or valve (manual)	Biweekly

3. Developments/Difficulties Encountered During the Reporting Month

- During system installation it was determined that temperature sensor wells T-C1, T-B4, and T-E1 contained up to 9 ft of suspected grout material at the bottom of the wells. The source of this material was unknown. Mc² attempted to clean out the wells with pressurized air on October 2 and 3 but this was not successful. Thus, the OptiTAM© sensors at the three wells are not monitoring temperature at the depths of the deep electrodes.

- The electrical steam generator for regenerating carbon vessels in the vapor treatment stream malfunctioned on October 11. This caused power loss to the site when the main breaker tripped. Mc² went to the site at this time to ensure power was safely restored to site with the steam generator power locked out. West Electric was onsite on October 12 and 15 to investigate the steam generator failure and perform repairs. With support from MK, on October 16 and 17, it was determined that the heating elements in the steam generator had failed, preventing its operation. MK sent replacements to the site for three of the six heating elements.

  On October 19, the three replacement heating elements for the steam generator were received and installed. On October 22, MK was on site and ensured the steam generator was functioning properly to regenerate the vapor carbon vessels. The steam generator operated at reduced capacity until the other three heating elements are replaced.

- On Saturday, October 20 a communication failure in the treatment system caused a "red" alarm that resulted in system shut down. The operator responded and traced out the communication issue. High winds developed in the afternoon that were causing false alarms with the fence security system. The operator remained at site until the evening to keep ET-DSP™ and the treatment system running during the wind storm.

- Moisture and emulsion produced in the air stripper of the liquid treatment stream prevented reliable PID readings and sampling of the vapor discharge sample port. Moving the sample point higher on the discharge stack did not resolve the issue. A knock-out assembly is being added at the sample location to remove moisture from the vapor stream prior to capture in a Tedlar® bag for PID screening and sample collection.

- On October 30, it was found that contaminants had saturated the regenerative carbon vessels and were being adsorbed in the sacrificial carbon. This resulted from a spike in contaminant concentration from the wellfield over the weekend. Mc² determined that daily steam regeneration cycles will be needed until the expected plateau in mass recovery is confirmed. In the meantime, operators will be on site seven days a week to perform the daily steam cycles.

- During the tap change on October 31, it was found that a voltage tap connection had overheated and failed on transformer of the 60 electrode PDS (PDS08). As a result, the transformer was disabled, preventing operation of 27 electrodes in the middle and shallow depths of the DNAPL containment area until the tap connection was repaired. A replacement bar connector arrived at the site on November 1 to bring the transformer back online.

All tap connections in the PDS transformers were cleaned and electrical termination compound was reapplied to the contact surfaces. These maintenance measures were taken to prevent resistive connections from developing during operation of the transformer.

4. Activities Anticipated for Next Reporting Month

- The heating phase of ET-DSP™ operations will continue, with IWM performing onsite operations. Mc² will take measures to improve the heating rate of the deep electrodes.
- Mc² will continue monitoring subsurface temperatures and reduce ET-DSP™ electrode power levels to maintenance mode when it is determined that target temperatures are achieved.
- Operators will begin transferring DNAPL product recovered from the treatment system to drums for off site disposal. A containment area will be set up within the site perimeter to hold the drums. A tracking list for DNAPL production will be kept for Resource Conservation and Recovery Act (RCRA) waste accumulation compliance.