BURNS McDONNELL

RAPID DESIGN AND DEPLOYMENT

OF LARGE-SCALE CREEK BYPASS AND SURFACE WATER TREATMENT SYSTEM

October 2023

Safety First

Implementing Safety Culture

Key Aspects of the MP14 Safe Program:

- Safety First!
- No distracted driving
- Everyone is responsible

Key MP14 Safety Statistics:

- 45 contractors
- 1,100 personnel on site
- 1,327,677 manhours worked

Agenda

1. The Event
2. The Challenge
3. The Solution (Diversion, Ponds, Treatment System, Piping)
4. Monitoring
5. Ongoing Activities

THE EVENT

The Event

12/07/22

Date of release

12,397

Barrels of crude oil released

- 5.6 kilometers *(3.5 miles)* of impacted creek
- Oil recovery efforts
- Boom and underflow dam installation
- Downstream monitoring

THE CHALLENGE

THE CHALLENGE

Release

12,397 bbls of crude oil

December 7, 2022

Impact to Surface Water

5.6 kilometers of creek impacted

Threat of dissolved phase concentrations migrating downstream to Little Blue River

Potential for Mill Creek to Flood

Large Creek with periodical flooding

Mill Creek runs through agricultural area, to little Blue River and on to Tuttle Creek Reservoir

Multiple Agencies Involved: U.S. Environmental Protection Agency, Kansas Dept. of Health and Environment, U.S. Army Corps of Engineers

The Challenge

Design Water Management Solution That Will:

- Divert incoming surface water
- Isolate/contain impacted surface water
- Dewater creek to allow for sediment removal
- Pre-treat recovered water for free oil and Total Suspended Solids (TSS)
- Primary treat for dissolved constituents

THE CONCEPTUAL DESIGN:

…it all started with a sketch on a napkin

Water Management Design Requirements

Diversion Design:

- Stormwater modeling
- Pumping and conveyance system
- Temporary Berm
- Outfall
- Monitoring

Water Treatment Design:

- Influent Volume and Characteristics
- Discharge Criteria
- Treatment Pond
- Phase Separation Pond
- Pumping System
- Treatment System
- Monitoring

THE SOLUTION

OUR SOLUTION

Designed and built Diversion, Storage and Treatment System

7th largest treatment system in the state of Kansas

Designed and built in 70 days

Diverted 3.7 million cubic meters of Surface Water

Two phased approach

Installation of temporary berms

Treated 204,000+ cubic meters of Impacted Water

Met 1.2 ppb benzene discharge limit w/ no exceedances

Demobilized the system in two weeks

Zero Regulatory Exceedances

Downstream monitoring performed during implementation

Oil recovered

Phase I Diversion

Phase 1 Diversion

Phase 2 Diversion

Phase 2 Diversion

Water Treatment Ponds *(prior to construction)*

Water Treatment Ponds

71,200 cubic meter water treatment pond

Treatment System

680-cmh Dissolved-Air Flotation Unit

Treatment System

818 cmh Water Treatment System

8-bag filters, 8 organoclay vessels

16-GAC vessels

Sized to handle 1 year, 24-hour, 1-inch storm event

Piping

45 cm HDPE Piping
1,200 meters

Outfall


Phase 2 Discharge
Phase 1 Discharge
Water Treatment Discharge

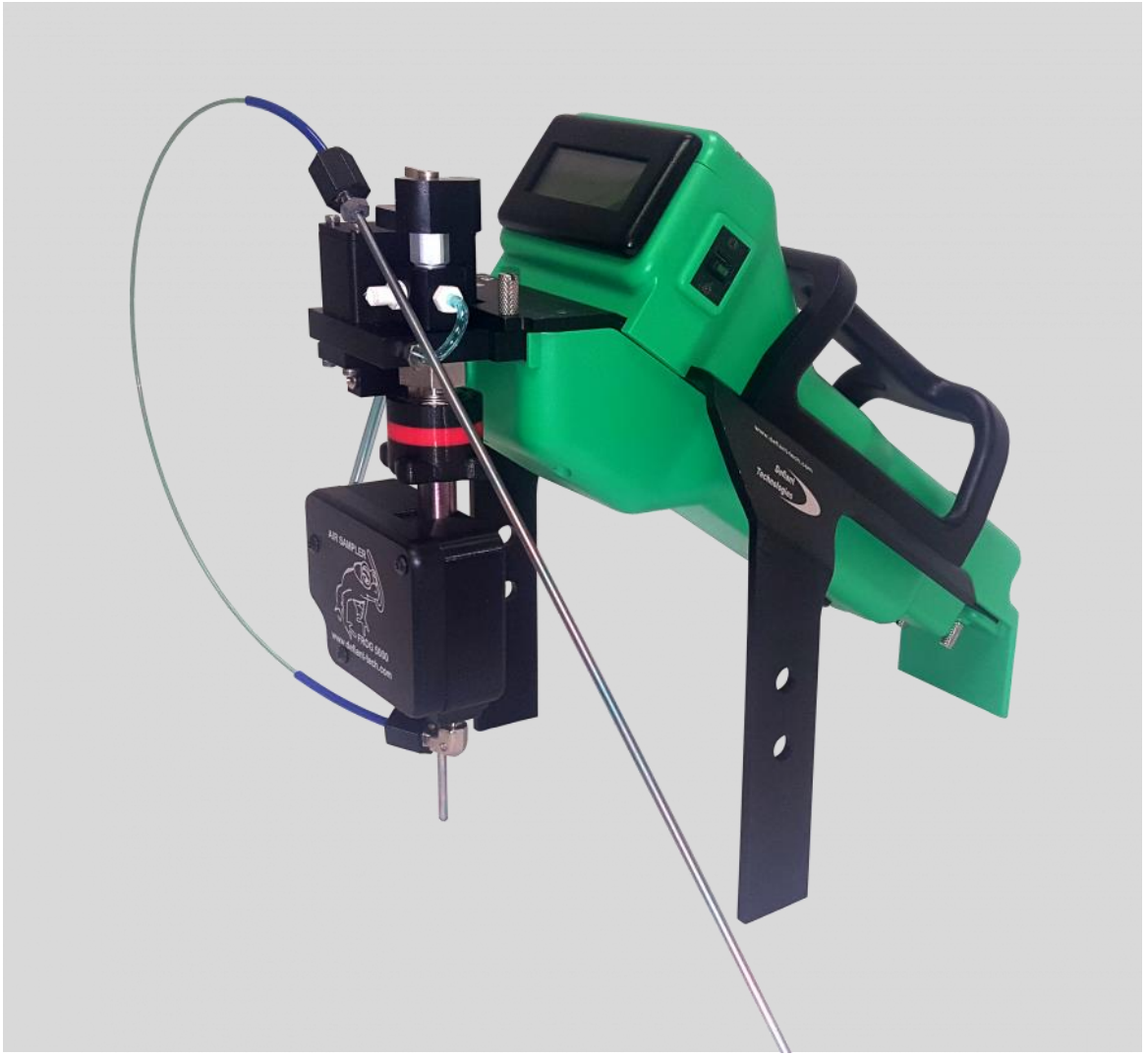
MONITORING

Monitoring Activities

Influent, Effluent and Downstream Monitoring

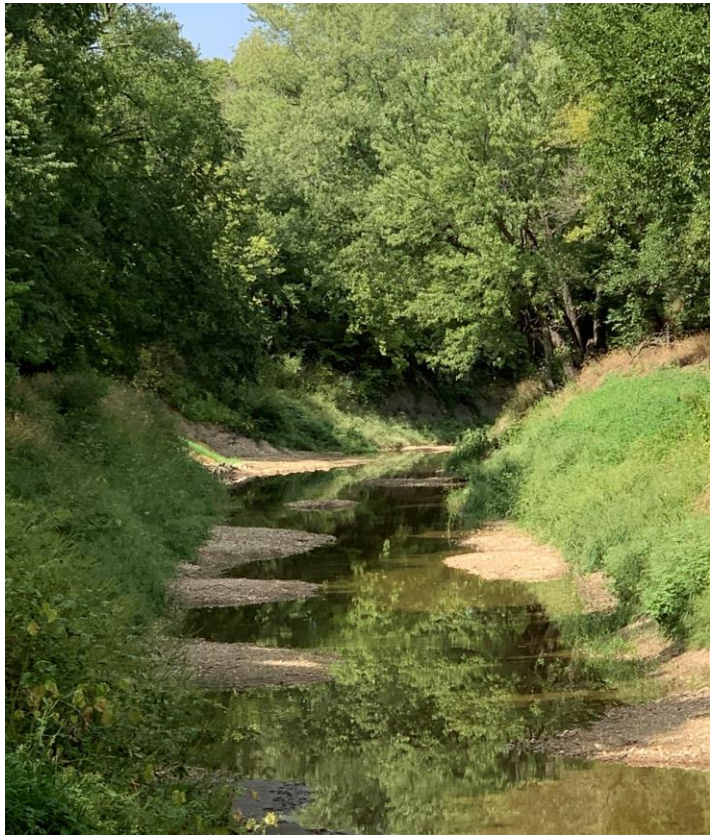
On Site Analytical Testing:

- Quick turnaround
- No exceedances
- Oil recovery from ponds
- Surfactant concentrations



ONGOING ACTIVITIES

Removal and Restoration



Removal:

- Oil impacted sediments
- Bank removal
- Rewater

Creek Restoration:

- Backfill
- Bank stabilization
- Final grade
- Seeding
- Planting

Closing Thought:

Risk mitigation requires constant communication and coordination.

Questions:

BMcD Scope of Work:

- **ssss**