PROJECT HIGHLIGHT

HIGH VOLUME, HIGH FLOW RECIRCULATION SYSTEM LEADS TO INJECTION SUCCESS

LOCATION: California
TYPE: DPT and Wells
LITHOLOGY: Silty Sand, Sand & Gravel Layers
NUMBER OF INJECTION POINTS: 86
CONTAMINATION: EDB, 1,2-DCA & Other COCs
REAGENT: ELS and SDC9
PROJECT DURATION: 80 Days

Executing high-volume injections in a constrained area requires precision, coordination, and the right technology. At a site in California, a confidential client needed a large-scale amendment injection program to remediate ethylene dibromide (EDB), 1,2-dichloroethane (1,2-DCA), and other contaminants of concern (COCs) within silty sand, sand, and gravel layers. Cascade was brought in to execute this complex injection project, ensuring effective distribution of amendments while maintaining a controlled and optimized flow rate.

PROJECT OVERVIEW

The scope involved the injection of emulsified lecithin substrate (ELS) and the dechlorinating bacterium SDC-9 across 86 injection points, utilizing both direct-push technology (DPT) and permanent wells.

The key objectives were:

- Delivering 1.9 million gallons of amendment solution over 80 field days.
- Injecting 1.12 million gallons into 72 temporary DPT points and 875,000 gallons into 14 permanent injection wells.
- Using multiple groundwater extraction wells to obtain and pretreat mixed water, ensuring optimal anaerobic conditions for bioaugmentation.
- Maintaining precise control of injection pressures and flow rates using Cascade's automated Pathfinder system, optimizing performance at each injection location.

This project presented logistical challenges due to the high injection volumes and the need to operate within a relatively small area. Additionally, ensuring even distribution across both DPT and well injection locations required careful flow management to prevent daylighting while maintaining production rates.

RESULTS

To address the challenge of injecting high volumes of amendment solution efficiently, teams utilized high-flow pumps and a manifold system capable of injecting into more than 30 points simultaneously. This approach allowed for continuous, large-scale injections while ensuring even distribution across the site.

The Pathfinder system played a critical role in optimizing injection performance by setting precise injection parameters—adjusting both flow rates and pressure particularly in minimizing daylighting issues. This flexibility allowed the project team to maximize injection efficiency while reducing downtime due to variable well acceptance rates.

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