TEA Inc. | Environmental Solutions

SUCCESS STORY

"Utilizing *Engineered_Phytoremediation*℠ to achieve hydraulic control of a metal-contaminated brackish groundwater underlying a capped former outfall pond."

PROJECT DETAILS

Location:
Western United States

Project Type:
Phytoremediation,
TreeWell®

PROJECT SUMMARY

TEA employed an *Engineered_Phytoremediation*℠ system to successfully achieve hydraulic capture of the shallow groundwater underlying a capped former outfall pond (FOP) while minimizing impacts on the integrity of the pond's cap system caused by system implementation.

REMEDIATION PLAN

In the summer of 2013, an *Engineered_Phytoremediation*℠ system was installed at the FOP. Previous investigations determined the hydraulic conductivity and other hydrologic characteristics of the area. This information, along with evapotranspiration rates and data obtained from a pilot study conducted to determine the most appropriate plant species for the project, were utilized in the final design of the *Engineered_Phytoremediation*℠ system. Due to the critical function of the FOP cap in preventing rainwater recharge of the area, it is critical that the phytoremediation system minimize the impact upon the integrity of the cap. To meet this challenge, a unique planting system was utilized for this project: the *TreeWell®* system, a patented technology that offers numerous advantages over conventional planting methods:

- Precludes rainwater from entering the system, thereby directing root growth downward
- Allows for an engineered planting design that targets specific depths/ horizons
- Highly adaptable. Allows designer to construct in-well treatment systems by adding soil amendments or flow-through treatment technologies

Using data obtained from earlier investigations, it was determined that 271 *TreeWell®* units would be sufficient to achieve the capture of FOP groundwater within three years of implementation. Baseline potentiometric data were collected during the winter of 2013/2014, prior to roots reaching the saturated zone. These data are used for comparison purposes to demonstrate the efficacy of the system in achieving hydraulic capture of FOP groundwater.

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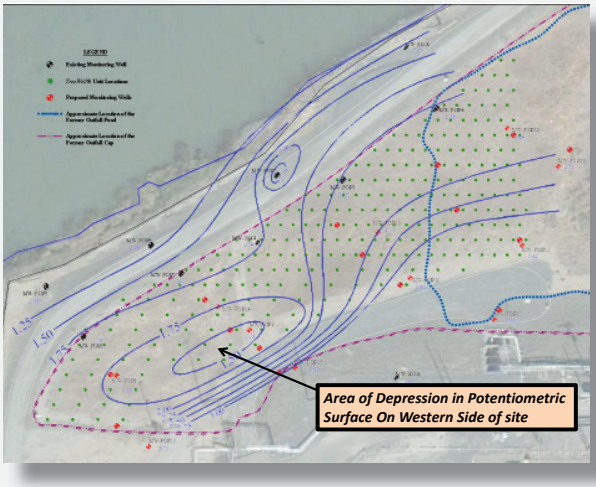
THE RESULTS

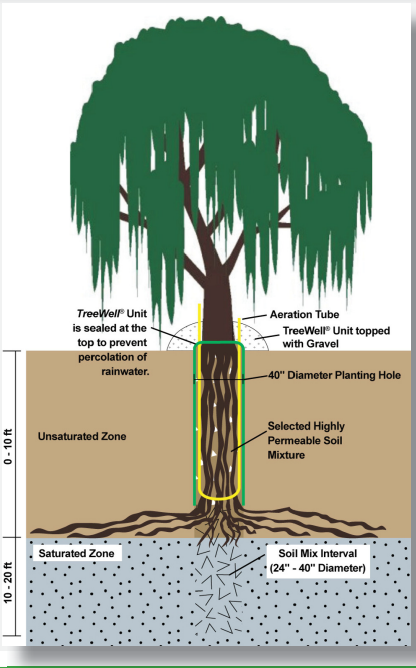
While the *Engineered_Phytoremediation*^{SM} system is currently in its establishment phase and still years away from full maturity, monitoring data suggest that the system is affecting the hydraulic gradient at the site. Groundwater elevation data indicate that there is an area of depression in the potentiometric surface on the western side of the FOP, which suggests that the system is already lowering groundwater elevations as the plants consume groundwater through evapotranspiration.

A key benefit of phytotechnologies for groundwater remediation is that these systems often improve in efficacy over time. As the plants grow larger, they evapotranspirate larger quantities of groundwater. This is a significant advantage as compared to conventional treatment technologies like pump-and-treat. Based on conservative modeling and current plant growth rates, it is therefore anticipated that the *Engineered_Phytoremediation*^{SM} system at the FOP will attain complete control over the hydraulic gradient within three years of implementation.

AREA SITE MAP



ENGINEERD_PHYTOREMEDIATION^{SM} SYSTEM



SYSTEM IMPLEMENTATION

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