

A Top-Down Approach for the Development and Implementation of GSR in Taiwan: Progress and Challenges

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Background/Objectives. Taiwan Environmental Protection Administration (TEPA) has been supporting projects to promote GSR concept, establish the GSR framework, and develop online assessment tools to assist GSR verification and best management practices (BMPs) selection since 2012. In 2016, GSR was added into the Proposal Guideline for Contamination Control or Remediation Projects and local Department of Environmental Protection (DEP) has been looking at these measures during proposal review. However, lack of proper evaluation tools makes it hard for TEPA to assess the efficacy of GSR. In this study, as the first step to devise domestic GSR evaluation indicators, we tracked (1) current status of 6 sites which participated in early GSR projects and (2) recent projects which used GSR assessment tool in order to understand the drivers and obstacles to the implementation of GSR in Taiwan.

Approach/Activities. To confirm that GSR measures were being followed, an inspection system was designed and documented during site visitation twice per year. The inspection team would review the contaminated sites background, remediation plans, and then come up with site-specific assessment sheets. During site visitation, inspection team would examine the actual acts and health and safety issues, and discuss with project contractors regarding the benefits and difficulties they considered while engaging in GSR framework.

Results/Lessons Learned. Information gathered during site visitation suggested that major concerns for remedial projects to adopt GSR measures were the impacts on remediation efficiency and additional cost of time and money. Four of the 6 sites considered GSR assessment tool required additional labor but failed to generate significant benefits. Also the assessment tool was not designed for dynamic project management therefore hindered the use for ongoing projects. One third of the sites (2/6) responded that remedies selection were mostly affected by the project time frame and budget, both set by DEP or TEPA, and the relative importance of GSR was minimized. For the 6 sites, BMPs for project management which improved overall project efficiency and reduce energy consumption were widely adopted. Two sites were using automated equipment to calculate and control chemical dosage as GSR assessment tool suggested, which reduced chemical consumption and also allowed real time project monitoring and chemical cost reduction. Results from regular inspection indicate that key issues for implementation of GSR in Taiwan remain as to internalize GSR concept during remedy design, establish quantifiable GSR evaluation indicators, and create incentives for the adoption of GSR.