

GIS Technology for Environmentally Polluted Sites with Innovative Process to Improve the Quality and Assesses the Environmental Impact Assessment (EIA)

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Abstract : The environmental impact assessment (EIA) must be improved, assessed, and quality checked for human and environmental health and safety. Soil contamination is expanding, and sites and soil remediation activities proceeding around the world which simplifies the answer “quality soil characterization” will lead to “quality EIA” to illuminate the contamination level and extent and reveal the unknown for the way forward to remediate, counting, containing, minimizing and eliminating the environmental damage. Spatial interpolation methods play a significant role in decision making, planning remediation strategies, environmental management, and risk assessment, as it provides essential elements towards site characterization, which need to be informed into the EIA. The Innovative 3D soil mapping and soil characterization technology presented in this research paper reveal the unknown information and the extent of the contaminated soil in specific and enhance soil characterization information in general which will be reflected in improving the information provided in developing the EIA related to specific sites. The foremost aims of this research paper are to present novel 3D mapping technology to quality and cost-effectively characterize and estimate the distribution of key soil characteristics in contaminated sites and develop Innovative process/procedure “assessment measures” for EIA quality and assessment. The contaminated site and field investigation was conducted by innovative 3D mapping technology to characterize the composition of petroleum hydrocarbons contaminated soils in a decommissioned oilfield waste pit in Kuwait. The results show the depth and extent of the contamination, which has been interred into a developed assessment process and procedure for the EIA quality review checklist to enhance the EIA and drive remediation and risk assessment strategies. We have concluded that to minimize the possible adverse environmental impacts on the investigated site in Kuwait, the soil-capping approach may be sufficient and may represent a cost-effective management option as the environmental risk from the contaminated soils is considered to be relatively low. This research paper adopts a multi-method approach involving reviewing the existing literature related to the research area, case studies, and computer simulation.

Keywords : quality EIA, spatial interpolation, soil characterization, contaminated site

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