

Geotechnical And Environmental Aspects Of Waste Disposal Sites Proceedings Of The 4th International Symposium On Geotechnics Related To The In Engineering Water And Earth Sciences

Despite the importance of preserving the environment in our developing world, activity involving the extraction of natural resources and the disposal of waste continues to increase. Such operations need to be conducted in a carefully-controlled manner, protecting both the natural environment and the communities who live in the vicinity. Every four years the GREEN (Geotechnics Related to the Environment) symposia are held, recognizing the major contribution that geotechnical engineering makes towards achieving the afore-mentioned goals. The meeting provides an international forum for the exchange of ideas, experiences and innovations. The GREEN 4 meeting discussed engineered disposal of waste in landfills; land contaminated by waste disposal and fluid flows; industrial waste dumps from mineral mining and extraction; and environmental management. The book contains expertise from nineteen countries around the world, and provides an integrated view of the latest research and practice in waste disposal. New and evolving ideas, ongoing concerns and developments throughout the world are discussed.

Nitrogen (N) is potentially one of the most complex elements on the Earth. It is necessary for all biological activity, but creates negative impacts on water and air quality. There is a balancing act between deficiency and surplus and the forms of N available further complicate our understanding of the dynamics. Biological fixation provides some plants with N supply while others are totally dependent upon N being available in the soil profile for the roots to extract. Nevertheless, the demand for N will increase because the human population with its increasing growth requires more protein and thus more N. Understanding the global N cycle is imperative to meeting current and future nitrogen demands while decreasing environmental impacts. This book discusses availability, production, and recycling of N in air, water, plants, and soils. It features information on N impacts to soil and water quality, management of N in agroecosystems, and techniques to maximize the use efficiency while minimizing the risks of leakage of reactive N into the environment. This volume in the Advances in Soil Science series is specifically devoted to availability, production, and recycling of N with impact on climate change and water quality, and management of N in agroecosystems in the context of maximizing the use efficiency and minimizing the risks of leakage of reactive N (NO₃, N₂O) into the environment. ? ?

GSP 122 contains 66 papers presented at the Ninth Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst, held in Huntsville, Alabama, September 6-10, 2003.

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This volume contains papers and reports from the Conference held in Romania, June 2000. The book covers many topics, for example, place, role and content of geotechnical engineering in civil, environmental and earthquake engineering.

This volume gathers the latest advances, innovations, and applications in the field of geotechnical engineering, as presented by leading researchers and engineers at the 7th Italian National Congress of Geotechnical Researchers (CNRIG 2019), entitled “Geotechnical Research for the Protection and Development of the Territory” (Lecco, Italy, July 3-5, 2019). The congress is intended to promote exchanges on the role of geotechnical research and its findings regarding the protection against natural hazards, design criteria for structures and infrastructures, and the definition of sustainable development strategies. The contributions cover a diverse range of topics, including infrastructural challenges, underground space utilization, and sustainable construction in problematic soils and situations, as well as geo-environmental aspects such as landfills, environmental and energy geotechnics, geotechnical monitoring, and risk assessment and mitigation. Selected by means of a rigorous peer-review process, they will spur novel research directions and foster future multidisciplinary collaborations.

The book is a research collection on the effects of rock and hydraulic mechanics on a landscape. It is suitable for those who want to learn about nature and study science. Many rock systems were formed directly in a mismatched state on agglomerated substrates, others on early, eroded substructures, later listed as Pre-Cambrian or Lewis and appeared in the eastern fissures of the massif were named earlier than the trenches in later volcanic eruptions.

The purpose was to assess the potential for environmental impacts of activities included in the recommended geotechnical field investigation program on three DoD siting areas. Siting areas are in Nevada, Arizona, New Mexico and Texas. (Author).

The U.S. Nuclear Regulatory Commission (NRC) has prepared this environmental impact statement (EIS) in response to an application submitted by Northwest Medical Isotopes, LLC (NWMI) for a construction permit for the NWMI medical radioisotope production facility. The EIS includes the analysis that evaluates the environmental impacts of the proposed action and considers the following alternatives to the proposed action: (1) the no-action alternative (i.e., the construction permit is denied), (2) one alternative site, and (3) two alternative technologies. After weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, the NRC staff's recommendation, unless safety issues mandate otherwise, is to issue a construction permit to NWMI. The NRC staff based its recommendation on the following factors: the NRC staff's review of the NWMI Environmental Report and responses to requests for additional information; the NRC staff's consultation with Federal, State, and local agencies and Tribal officials; the NRC staff's independent environmental review; and the NRC staff's consideration of public comments. Related products: Other products published by the U.S. Nuclear Regulatory Commission can be found here: <https://bookstore.gpo.gov/agency/nuclear-regulatory-commission-nrc> Environment & Nature resources collection can be found here: <https://bookstore.gpo.gov/catalog/environment-nature>

This first Issue in the series contains nine articles written by experts from the mining industry, regulatory authorities, and academia, and

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incorporates the latest research.

Focuses on actual, state-of-the-art design/construction procedures as opposed to a discussion of solid waste management issues and to general descriptions and/or conceptual designs. Provides an integrated package of analytical tools, design equations, and step-by-step construction procedures for all elements of a landfill, giving the reader a better sense of the necessary site investigation, planning, analysis, and organization that go into a landfill design and construction project. The characteristics of landfill containment envelopes and their design/construction are treated in detail. Physico-chemical and engineering properties of solid waste that are relevant and important to landfill design and construction are tabulated and described. Includes explanation of how to evaluate and assess potential problems that affect landfill performance such as sideslope stability, settlement, containment effectiveness, and erosion control. Discusses vertical landfill expansion; how leachate moves across a liner or barrier under both advection and diffusion; compares the containment effectiveness of different liner systems to the combined advective-diffusive transport of dissolved leachate solutes. Includes a detailed explanation with numerical examples and calculations of how to design a gas collection and piping system in a landfill—including the collection and handling of condensate in the gas. Detailed installation and inspection guidelines are provided for both earthen and geosynthetic liner/cover systems—comparing the relative advantages and limitations of each. For professional training courses in Geotechnical and Geoenvironmental Engineering.

Design and Construction of Pavements and Rail Tracks - Geotechnical Aspects and Processed Materials is a compilation of selected contributions produced between 2002 and 2005 by the International Committee TC3 - Geotechnics of Pavements of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), a committee dedicated to gathering current knowledge of geotechnical aspects relating to pavements and rail tracks. The volume presents advanced procedures for laboratory and field materials characterization, including processed materials (non-conventional road construction materials), novel tests for field stiffness evaluation, a pre-standard for roller integrated continuous compaction control and new theories for evaluation of the long term performance of materials, including environmental aspects. These contributions represent the latest developments relating to the design, construction and long term performance of pavements, rail tracks and earth structures, with emphasis on the geotechnical and environmental background.

This text covers topics such as sinkhole formation and regional studies of sinkholes and karst. Issues addressed are taken from the 8th multidisciplinary conference on this subject and chart the characteristics of sinkholes and karst as well as their environmental repercussions. Field Instrumentation in Geotechnical Engineering documents the proceedings of a symposium of the same name organized by the International Society for Soil Mechanics and Foundation Engineering. The said symposium covers the developments in the instruments and techniques in field instrumentation. The book is divided into two parts. Part 1 covers the 37 papers included in the symposium, which cover topics such as the measurement of spatial deformations; the measurement of in situ stress and strain for solids, earth pressure and anchor forces; ground round displacement; and techniques and equipment using the surveyors lever. Part 2, on the other hand, covers the sessions during the symposium, which include topics such as different principles of measurement; the application of instrumentation; and interpretation of their results. The text is recommended for those in the field of geotechnical engineering who would like to know more about instrumentation and the processes and techniques involved in it.

The feasibility of constructing a 25-50 MWe geothermal power plant using low salinity hydrothermal fluid as the energy source was assessed. Here, the geotechnical aspects of geothermal power generation and their relationship to environmental impacts in the Imperial Valley of

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California were investigated. Geology, geophysics, hydrogeology, seismicity and subsidence are discussed in terms of the availability of data, state-of-the-art analytical techniques, historical and technical background and interpretation of current data. Estimates of the impact of these geotechnical factors on the environment in the Imperial Valley, if geothermal development proceeds, are discussed.

This report presents a portion of the results from a one-year feasibility study sponsored by the Electric Power Research Institute (EPRI) to assess the feasibility of constructing a 25-50 MWe geothermal power plant using low salinity hydrothermal fluid as the energy source. The impact of power generation from hydrothermal resources on subsurface water flow, seismicity and subsidence are of acute interest in the determination of the environmental acceptance of geothermal energy. At the same time, the experience and data bases in these areas are very limited. The objective of the project was to assess the technical, geotechnical, environmental and economic feasibility of producing electricity from hydrothermal resources like those known to exist in the US. The objective of this part of the study was to investigate the geotechnical aspects of geothermal power generation and their relationship to environmental impacts in the Imperial Valley of California. This report discusses geology, geophysics, hydrogeology, seismicity and subsidence in terms of the availability of data, state-of-the-art analytical techniques, historical and technical background and interpretation of current data. It also discusses estimates of the impact of these geotechnical factors on the environment in the Imperial Valley, if geothermal development proceeds.

Environmental Impacts of Mining is a comprehensive reference addressing some of the most significant environmental problems associated with mining. These issues include destruction of landscapes, destruction of agricultural and forest lands, sedimentation and erosion, soil contamination, surface and groundwater pollution, air pollution, and waste management. The book presents an agenda for minimizing environmental damage and offers solutions for the restoration and remediation of degraded areas. This book is a "must have" for environmental consultants, regulators, planners, workers in the mining industry, geologists, hydrologists, hazardous waste professionals, and instructors in the environmental sciences.

Sustainability is becoming a key factor in most construction projects. In most construction projects, personnel are spending efforts to understand the social, economic and environmental impacts of the various facets of construction projects. Geotechnical engineering can contribute to the sustainability of the project via selecting sustainable materials and construction processes that would lead several tangible benefits. For example a pipeline generally runs through a long and varying terrain which results in innumerable environmental impacts during a pipeline installation. Therefore, it is necessary for the design engineer and also the owner to estimate these impacts of pipe installation and evaluate various methods to minimize them. As a part of the pipeline layout and construction, large amounts of soil will be excavated during the pipeline installation process. Similarly, large amounts of soil need to be imported for bedding and backfilling of the trench. Both importing new fill material and exporting excavated trench material for landfilling will have serious implications on both the economic and environmental aspects of the construction project. The main focus of this research is to study and investigate the reutilization of excavated trench material for various applications including pipe backfills. For this purpose, Integrated Pipeline (IPL) project which is a joint effort between the Tarrant Regional Water District (TRWD) and Dallas Water Utilities (DWU) that will bring additional water supplies to the Dallas/Fort Worth metroplex is considered in this research. Soil samples were collected along the pipeline alignment and comprehensive geotechnical

characterization studies including estimation of expansive clay minerals are attempted. Based on these studies, the sampling materials are identified for potential reuse as backfill, bedding and haunch materials. Economic and environmental benefits of the suggested reuse method of using insitu excavated material versus imported material were also evaluated. To quantify these benefits, a hypothetical section of a pipeline is assumed and both Cost and Carbon footprint analyses were performed on this section. Two different scenarios were considered in this research; one scenario used insitu treated excavated material for bedding and haunch layers while the second scenario used imported material for the same. This analysis showed a difference of more than 100% savings in carbon emissions when insitu treated excavated material is used instead of importing material. The hypothetical section assumed gives an idea of how carbon footprint analysis and cost analysis may be performed and briefly highlights the relative merits.

GSP 105 contains 12 papers on geotechnical solutions to environmental problems presented at sessions of Geo-Denver 2000, held in Denver, Colorado, August 5-8, 2000.

This thesis presents a critical review of studies that apply environmental life cycle assessment (LCA) or life cycle-based analysis methods to geotechnical systems to summarize the current body of knowledge and present substantive findings and methodological approaches. This review examines sources of variability and uncertainty across current LCA studies and provides recommendations for best practices for future geotechnical LCAs. Specific attention is given to review of the life cycle impact assessment (LCIA) phase to broadly evaluate the environmental indicators and impact categories currently applied and/or recommended with relevance to geotechnical LCAs. Ultimately, this thesis presents a comprehensive review of the current state of practice for LCA in geotechnical engineering to identify critical gaps and key issues to address in future research efforts and geotechnical LCAs. The information presented in this thesis establishes important findings on the development and application of LCA as it relates to the geotechnical engineering field and, as such, is of interest to a broad readership including geotechnical engineers, policy-makers, researchers, and LCA practitioners. Aside from challenges in creating a standardized LCA framework pertinent to the geotechnical engineering field, many barriers to implementing geotechnical LCAs still exist—including the availability of region-specific data, quality and granularity of data, and challenges due to the spatial heterogeneity and site-specific nature of soil properties and geotechnical projects, among many others. Additionally, geotechnical LCAs published within the last decade are neither tracking important environmental indicators (e.g., indicators of soil quality, soil function, and ecosystem services) nor reporting impact categories with sufficient detail and transparency. Many of the environmental indicators common in LCA (including those currently under development) do not appropriately account for concerns specific to geotechnical projects and the discipline more broadly. Accordingly, these indicators may not be fully or effectively capturing important environmental impacts and tradeoffs associated with geotechnical projects for policy and decision making purposes. Further research is needed to develop LCA guidelines tailored to the needs of the geotechnical engineering community to establish common criteria and methods for future geotechnical LCAs. Additional research is needed to address the critical gaps outlined in this thesis and further

develop or refine environmental indicators, impact categories, and cause-effect pathways as they pertain to geotechnical systems—in particular those that relate to soil quality and function, and associated ecosystem services. Note: This thesis builds on a previously published article in the Proceedings of the Institution of Civil Engineers - Engineering Sustainability (Kendall, Raymond, Tipton, and DeJong (2018). Review of life-cycle-based environmental assessments of geotechnical systems. Volume 171, Issue 2, pp. 57-67) (available at: <https://doi.org/10.1680/jensu.16.00073>). This thesis also builds on a manuscript submitted to the Journal of Industrial Ecology in September 2018 (Raymond, Tipton, Kendall, and DeJong. Review of Impact Categories and Environmental Indicators for Life Cycle-Based Environmental Assessments of Geotechnical Systems). Some excerpts throughout this thesis are taken verbatim, whereas others are paraphrased for consistency and harmonization with additional research efforts. Growing urban populations have resulted in the development of marginal land and brownfield sites as well as increasing the desirability of maximum utilisation of underground space. As a result, there is an increasing need for urban planners and developers to understand the geotechnical and geo-environmental issues involved in urban construction. Hidden aspects of urban planning aims to raise the awareness of geotechnical and geo-environmental issues among urban planners and within the urban planning frameworks across Europe.

Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions contains invited, keynote and theme lectures and regular papers presented at the 7th International Conference on Earthquake Geotechnical Engineering (Rome, Italy, 17-20 June 2019). The contributions deal with recent developments and advancements as well as case histories, field monitoring, experimental characterization, physical and analytical modelling, and applications related to the variety of environmental phenomena induced by earthquakes in soils and their effects on engineered systems interacting with them. The book is divided in the sections below: Invited papers Keynote papers Theme lectures Special Session on Large Scale Testing Special Session on Liquefact Projects Special Session on Lessons learned from recent earthquakes Special Session on the Central Italy earthquake Regular papers Earthquake Geotechnical Engineering for Protection and Development of Environment and Constructions provides a significant up-to-date collection of recent experiences and developments, and aims at engineers, geologists and seismologists, consultants, public and private contractors, local national and international authorities, and to all those involved in research and practice related to Earthquake Geotechnical Engineering. Expanding a port, deepening a navigation channel or creating new land for development, introduces changes to our physical, social, economic and political environment. Changes may result from events during the construction process, or relate to the nature of the completed structure. Changes can be positive or negative, short-term or long-term, and may affect the immediate vicinity of the project or a larger geographical area. Predicting and assessing all possible effects of a planned dredging activity in a scientifically-sound and reliable manner is essential, so that appropriate control measures can be taken to avoid or mitigate unwelcome impacts. This book provides guidance for a complete holistic environmental evaluation procedure and for the design and implementation of environmental control measures. The book is of particular interest to engineers, government agencies and port authorities, as well as civil engineering consultants and contractors involved in planning and designing dredging, maritime infrastructure and fluvial projects.

Only book world-wide addressing this topic. The principal output of the European co-operative Action on "Water Movements in Road

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Pavements & Embankments". Provides unique guidance on assessing water condition and its affects on road performance. Provides unique guidance on assessing and ameliorating contaminant movement in pavement groundwater. Written by leading experts in Europe.

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