

ENV 504: Remediation of Soils and Groundwater

Project Instructions

You are provided with data for a real contaminated site (it might have been remediated by now).

This project will be carried out by groups of three students that will self-select. Each group will select its own approach to remediate the aforementioned site. Both groundwater and soil remediation will need to be achieved (if both are contaminated). The end points should be determined based on Swiss regulations even if the site is located outside of Switzerland. Remediation of all contaminants is a requirement for this project. If it is not possible to remediate a contaminant, an explicit case should be made for why.

Project organization

The following are the deliverables:

- Presentation (graded) of a case study from the literature (in class) on October 7th
- A summary of the data relevant to the site is due on October 7th.
- A selection of the remediation strategy is due on November 11th.
- The oral exam (during the exam session) consists of a 20-minute presentation followed by 10 minutes of questions for each group.
- A final report is due on January 8th.

- All assignments are due by 5p on the day of the deadline. For the report, there will be a grade penalty for tardiness. See details in remediation project description. For the non-graded assignments, no feedback will be provided if the document is turned in late.

Starting on December 2nd, there will no longer be lecture or problem sets. The students will be free to use the time to work on the project. The instructors will be available in their respective office by appointment. A doodle link will be available on Moodle for individual groups to book time in 30-minute time slots.

Data summary:

You are provided with raw data for a site. The goal of this document is to provide an organized summary of the data so that it is easy to access them when the time comes to design the remediation strategy. The students will have to go through the document(s) provided and extract the relevant data: contaminant types, concentrations, and locations (including depth). Ideally, it would be beneficial to map the contaminants as best as possible as this will help determine where specific remediation approaches will be implemented (if more than one is needed). Also, try to use the data to identify (or assume) soil and sediment characteristics. The idea is that you have the key information you need to design the remediation strategy. This assignment is due by 5p on October 7th. No feedback will be provided if the document is turned in late.

Selection of remediation strategy:

Here, you will present the remediation strategy you selected, why you selected it, and where and how you will implement it. At this stage, no quantitative work is required, it is

simply an opportunity for the instructors to provide feedback on potential issues with the selected strategies. This assignment is due by 5p on November 11th. No feedback will be provided if the document is turned in late.

Report:

The report should be 15-20 pages (plus appendices, if relevant). In it, you should include a brief description of the site and the contaminants and any challenges.

Then, you should summarize your approach and how it would be applied to this site, highlight your major findings and recommendations and clearly outline the advantages and disadvantages of the approach you are considering for this particular site. Make use of the literature available to you through the library. Be as quantitative as you can be given the information available.

It is important that you be quantitative in your design. The instructors want to see how many wells you place, how much reagent you add, how often you regenerate the activated carbon, etc... The first part of the course is designed to provide you with the know-how to do that. You will need to make assumptions about the site, state those assumptions and use them for your calculations.

The report needs to be clearly structured, and information should be organized in a logical manner. The goal of this exercise is to propose the most effective option, but the instructors value creative approaches as well.

Cost will need to be calculated based on information provided by an engineering consulting company and by the US Federal Remediation Technologies Roundtable site (<https://www.ftr.gov>).

The report is due June 8th by 5p as an electronic version sent by email to all instructors. No excuses (short of hospitalization) will be accepted. Penalty for late submission is 10% of grade for the first 12-hour period. Beyond that time, the penalty will be 25% per 12-hour period.

Presentation:

The presentation (30 minutes + 15 minutes for questions) will be graded on the clarity of its content and the quality of the delivery. An evaluation matrix is available on the website. All presentations are scheduled during the exam hours. A schedule will be provided in due time. Please note that I expect you to be ready to answer all questions, even detailed questions about specific calculations. This is a major deliverable and way for me to evaluate you.

Suggested outline for final report

[This is only a suggested outline. You are free to use any format you want.]

Cover letter
Title page
Executive summary (1 page)

page numbers in roman numerals

Table of contents
List of tables
List of figures

1. Introduction (~2 pages)

Body of the report begins here. Use Arabic numerals to number pages

- Brief site description
- General description of the approach you tackled
- Scope of your report

2. Proposed remediation approach (~15 pages)

- Overall approach
- Basis for the approach (e.g., literature)
- Quantitative (detailed) description
- Cost

3. Analysis of the process (~3 pages)

- Advantages of the process chosen and the specific design selected
- Limitations and feasibility for the particular site

4. Summary and conclusions (~1 pages)

- Recommendations for implementation