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土壤修复
共建可持续环境
SOIL REMEDIATION FOR
SHAPING A SUSTAINABLE ENVIRONMENT



业务垂询请发送邮件至group-AsiaSoilRemediation@suez.com
For inquiries, please email to group-AsiaSoilRemediation@suez.com



土壤资源是世界上宝贵的资源，是人类生活和生产最基本、最重要的自然资源之一，随着社会的发展和科学的进步，土壤污染问题日益严重。土壤作为90%污染物的最终受体，其环境污染目前已对食品安全、饮用水安全、生态安全、环境健康以及气候变化构成了严重的威胁。

Soil is one of the most basic and important natural resources for human life. With the development of society and technology, the soil pollution has become increasingly serious. As the final receptor of 90% of pollutants, the environmental pollution of soil has now posed a serious threat to food safety, drinking water safety, ecological safety, environmental health and climate change.

作为土壤修复全球领导者，苏伊士在全球设有5大土壤修复中心，成功完成4500多个土壤修复案例。苏伊士可以提供原位或异位的污染土壤修复全方位解决方案，我们的专家可以针对不同情况对被污染的场地进行修复，恢复土地的使用功能，使其获得第二次生命。

As a global leader in soil remediation, SUEZ has five soil remediation centers around the world. SUEZ also completed more than 4,500 soil remediation cases. We offers a full range of solutions for in-situ or ex-situ remediation of contaminated soils. Our experts can remediate contaminated sites for different situations and give it a second life.

欧洲布局 Soil Remediation in Europe

- | | |
|--|--|
|  土木工程 Civil engineering |  地质学-水文地质学 Geology - Hydrogeology |
|  化学-生物学 Chemistry - Biology |  水处理 Water treatment |
|  工程设计 Engineering Design |  物流 Logistics |
|  生态毒性 Ecotoxicity | |

5

家欧洲子公司
5 subsidiaries
in Europe

40

年经验
40 years of
experience

11

11个国家
in 11 countries

200

拥有超过
200个不同领域的专家
Over 200 experts

中国地区服务范围

Service scope in China

在中国，我们在香港已成功修复7个堆填区并持续养护，增加城市生物多样性；苏伊士在中国布局两个土壤修复业务平台，分别位于重庆和上海。

In China, We have successfully rehabilitated seven landfills in Hong Kong and continue to maintain them to increase urban biodiversity. SUEZ has two soil remediation business platforms in China, which are located in Chongqing and Shanghai.



污染场地环境调查
和风险评估

Environmental
investigations and risk



污染修复治理
方案设计

Remediation
project design



环境监测

Environment
monitoring



土壤和地下水
污染修复

Soil and groundwater
remediation



垃圾填埋场
治理及修复

Landfill remediation &
rehabilitation



油泥等工业固废
治理及资源化

Treatment and resource
utilization of industrial solid
wastes (oil sludge)



矿山生态修复

Mine restoration &
remediation



水体底泥治理

Water sediment
remediation

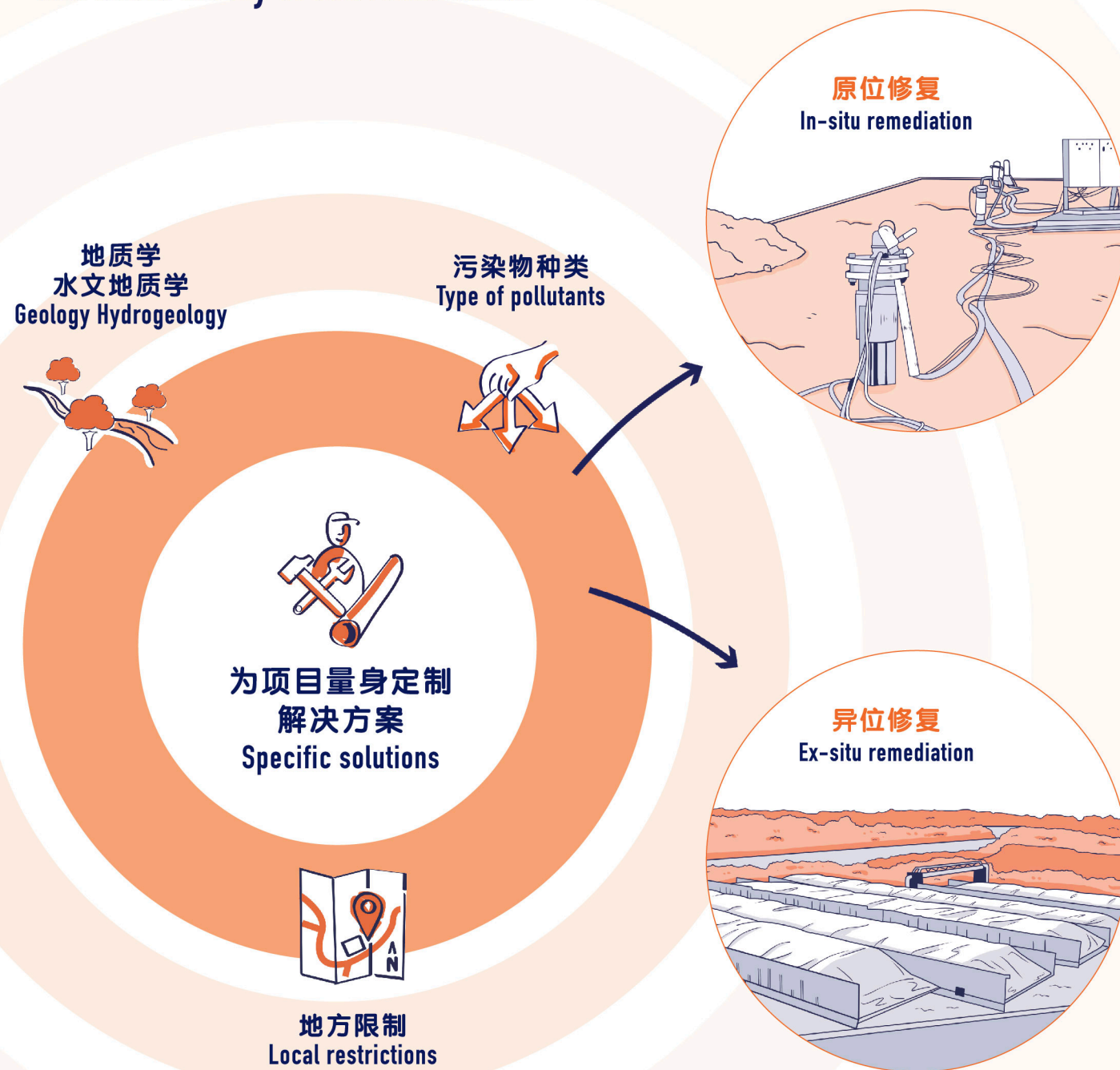


流域水环境综合治理

Comprehensive management
of water environment
in river basin

修复方式多样化的原因 及土壤修复基本理论

Reasons for the diversity of remediation methods
and basic theory of soil remediation



我们的技术:

根据污染类型, 选择最优的解决方案

We choose the optimal solution according to the type of pollution

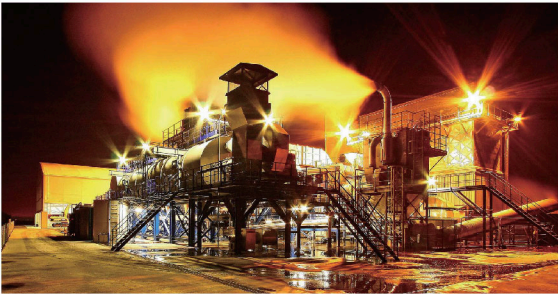
- 热脱附技术 Thermal Desorption
- 土壤淋洗技术 Soil washing
- 化学氧化/还原技术 Chemical Oxidation/Reduction
- 生物处理技术 Biological Treatment
- 土壤气相抽提技术 Soil Vapor Extraction (SVE)
- 多相抽提技术 Multi-Phase Extraction (MPE)
- 地下水抽提处理技术 Groundwater Pump and Treatment(P&T)
- 风险管理 Risk Management
- 稳定化固化技术 Stabilization
- 热水洗技术 Hot Water Washing
- 焚烧处理技术 Incineration
- 溶液萃取技术 Solution Extraction



英国 UK

THE AVENUE 焦化厂

工业场地去污染和修复(2009–2016) site remediation



问题 Question

- 修复英国最大的工业复合区之一
(从前的煤矿基地及后来的化学品生产基地)
Remediation of one of UK's largest industrial complex (former coal mine then chemical production site)
- 难处理的污染物: 包括烃类, 重金属, 氰化物以及废化学品
Challenging contaminants including hydrocarbons, heavy metals, cyanides as well as waste chemical products

解决方案 solutions

- 处理及修复98公顷煤矿及化学品生产基地污染的土壤
Decontamination and restoration of the contaminated soil of a 98 hectare formal coal and chemical industrial complex
- 土方工程, 预处理和筛选, 生物修复, 热解吸, 地下水处理, 绿化覆盖和恢复
Earthworks, pre-treatment and screening, bio-remediation, thermal desorption, treatment of groundwater, coverage and restoration of green areas

优点 benefits

- 场地复垦: 1,500,000m³的材料被挖掘, 400,000吨用于热处理
Site reclamation : 1,500,000 m³ of material excavated, 400,000 tons for thermal treatment
- 材料再利用: 混凝土碾碎后在工地上再用
Material recovery : Concrete crushed for reuse on site

中国 China

上海某钢笔厂 Pen factory in Shanghai

土壤与地下水修复项目
Soil and groundwater remediation(2016–2017)



问题 Question

主要污染物: 多环芳烃、氟利昂-113、总石油烃
Main pollutants: PAHs, Freon-113, TPH

解决方案 solutions

土壤修复技术: 原位化学氧化
Soil remediation method: In- situ chemical oxidation
地下水修复技术: 抽提处理技术
Groundwater remediation method: pump and treat technology

优点 benefits

不破坏场地内的建筑物进行修复
Remediation the site without damaging the buildings on site

比利时 Belgium

FRISWIT BROWNFIELD

场地修复(2010–2013) site remediation



问题 Question

- 曾经的工业场地的土壤和地下水被工厂生产的挥发性氯化烃和矿物油所污染
Remediation of a former industrial site polluted by VOCL (chlorinated hydrocarbons) and mineral oil in ground and groundwater
- 由于从前工厂从事干洗业务, 场地存在大量的挥发性有机物
Large plume of VOCL is present due to the former dry clean activities

解决方案 solutions

- 在污染核心区通过垂直注射井进行原位化学氧化
In-situ chemical oxidation in the core zone of the pollution by means of vertical injection wells
- 羽流区通过注射油乳剂进行修复, 激发挥发性有机物的生物好氧分解
The plume area has been remediated by injection of an oily emulsion to stimulate the anaerobic bacterial breakdown of the VOCL

优点 benefits

- 保证以环境保护为导向的土壤修复
Ensure environmental protection recovery through secured and controlled processes
- 保障工业场地的封闭, 将生命资产的末端转化为已恢复的生态系统
Secure industrial site closure and transform end of life asset into a rehabilitated ecosystem

中国 China

香港将军澳堆填区 Tseung Kwan O Landfill

填埋场修复项目 landfill restoration



问题 Question

已关闭的堆填区的修复期至少需要30年, 解决废物分解时产生的堆填气体、固体废物产生的渗滤污水、土地沉降不稳定等各种环境问题。
Full restoration of a closed landfill may take at least 30 years to deal with the environmental problems such as landfill gas, leachate, settlement, etc.

解决方案 solutions

苏伊士自1999年开始对该堆填区域进行修复养护, 修复保养已关闭的堆填区。
Tseung Kwan O Landfill Restoration started in 1999, the waterfront of the former Tseung Kwan O Stage I Landfill was developed into community facilities.

优点 benefits

修复后填埋场变回城市绿地公共康乐设施, 并将收集的堆填气体转化为能源。
restore landfill to develop urban parks and public entertainment facilities. The collected landfill gas is used as a thermal energy source in the treatment of landfill leachate.