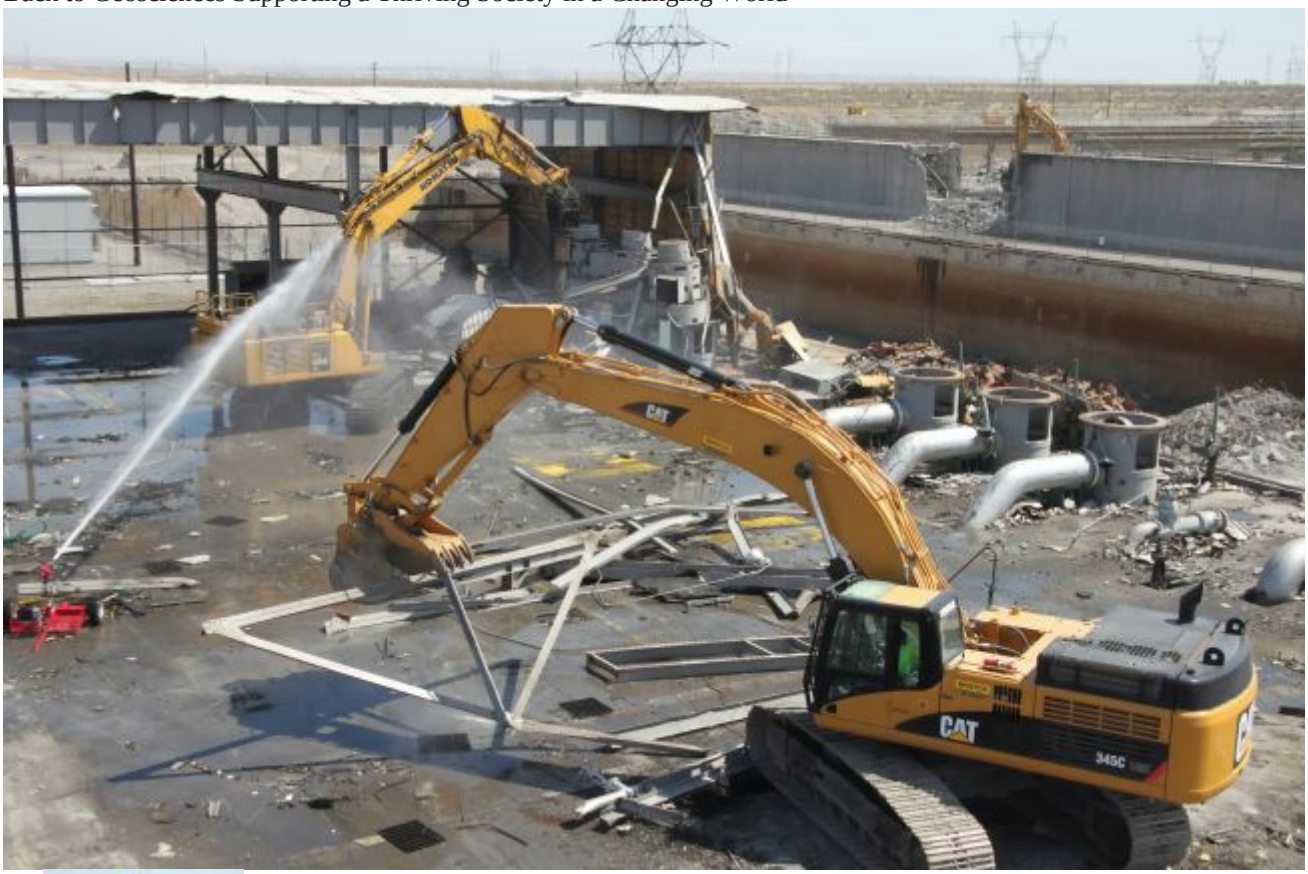
Managing Waste Disposal

Back to Geosciences Supporting a Thriving Society in a Changing World



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Managing Waste to Maintain a Healthy Environment

Waste is an inevitable byproduct of society. The composition, volume, and toxicity of waste varies over space and time through different human activities. As a result, historic assessment of waste provides opportunities for reuse and helps us understand environmental impacts. Protection of human health and the environment relies on geoscience knowledge to isolate waste materials from people and ecosystems. Geoscientists translate their understanding of complex Earth systems into meaningful approaches for isolating waste streams and remediating waste sites to be productive land again.

image/svg+xml 1948 WaterPollution ControlAct 1965 SolidWaste DisposalAct 1972 CleanWaterAct 1976 SolidWasteDisposalAct Amendment ToxicSubstancesControlAct ResourceConservation& RecoveryAct 1980

Comprehensive Environmental Response, Compensation,& LiabilityAct Low-LevelRadioactive WastePolicyAct 1982 Nuclear Waste Policy Act 1984 Hazardous& SolidWaste Amend ments 1986 Superfund Amendments& Reauthorization Act Emergency Planningand CommunityRight- to-KnowAct 1990 PollutionPreventionAct OilPollutionAct 1992 CommunityEnviron mental ResponseFacilitationAct 1996 Mercury-Containing& RechargeableBattery ManagementAct 1999 SuperfundRecyclingEquityAct 2002 SmallBusinessLiability ReliefandBrownfields RevitalizationAct Waste Disposal Legislative Timeline 1945 50 55 60 65 70 75 80 85 90 95 05 10 15 2000 2020

Source: https://www.gao.gov/assets/680/672734.pdf0510152025303540455019992000010203040506070809101112201 3New EPA Non-Federal Remedial Action Project Funding DecisionsProjects FundedProjects Not Funded

To optimize the balance between resource use and a healthy society:

Assess the safety of disposing of liquid waste in deep wells. This method of disposal is commonly used to dispose of treated wastewater, chemicals, and oil field brines, but it can potentially induce earthquakes or contaminate groundwater. Geoscience investigations can help make this type of disposal safer.

Understand and minimize impacts of energy production and usage. Energy production byproducts include solid wastes such as fly ash, thermal pollution of water from power plant cooling, liquid wastes, and gaseous byproducts like CO_2. Geoscientists have a key role in ensuring this waste is safely disposed of and stored, and they will be at the forefront of a circular economy where re-use and recycled materials formerly considered waste become a resource.

Mitigate the risks associated with nuclear waste. Large volumes of spent nuclear fuel are stored at multiple temporary sites in the United States, and more such waste continues to be generated. A long-term disposal option is still needed for this toxic radioactive waste, and a geologic repository may provide a long-term solution. Geoscientists provide information to help assess site suitability and selection.

Support cleanup of abandoned mines, brownfields, and Superfund sites. Landfills, dumps, and spills can introduce a variety of toxic chemicals into the environment. Geoscience provides a basis for evaluating risks, setting priorities for remediation, and assuring that expenditures yield substantial benefits. Geoscientists also work to understand ocean systems in order to assess the movement and impacts of plastic waste in marine environments.