Mount Trashmore

Site:

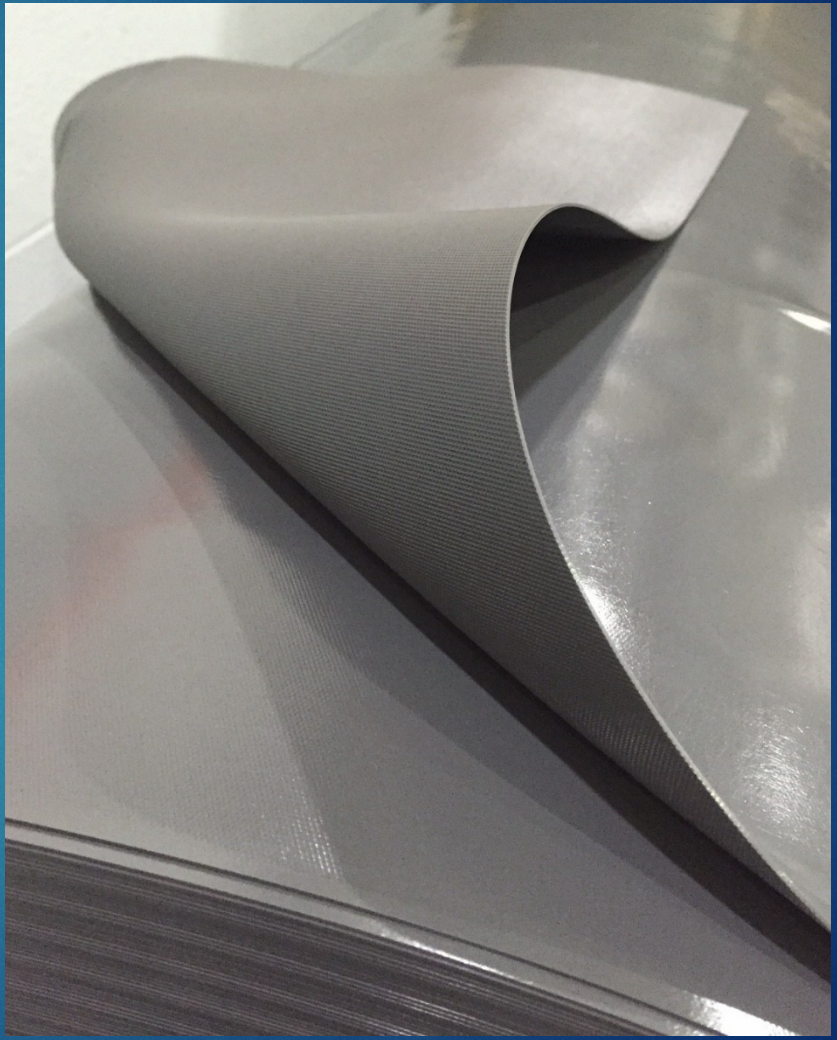
14 Acres or 18 Acres
717,000 cubic yards

Distance from school: 27 yards

Distance from 64 unit Sunset Marina Condominiums: 100 yards

CERTIFICATION OF COMPLETION OF LONG-TERM CARE REPORT

The Stock Island Landfill was closed in two phases; Phase I was closed in 1990 and Phase II was closed in 1992. The landfill was closed by placing 18 inches of screening sand over one layer of 30-mil PVC geomembrane, which, in turn, overlies 6 inches of bedding sand. Phase I and II construction information not pertinent to this Report is included on OCULUS and therefore omitted from inclusion in this report.




1/1994

Image U.S. Geological Survey

Current Status:

2016 – Key West released from long term care. City is still required to maintain liner, storm water management, and grounds maintenance. We also perform pest management and voluntary groundwater monitoring.

Yearly cost: Less than 50K

T E C H N I C A L M EMO R A N D UM BI0104190651GNV 1

Evaluation of Stock Island Landfill for Beneficial Use

https://www.ch2m.com/

Benefits:

- Avoiding perpetual maintenance, landfill-related costs
- Increasing the land value
- Making the site available for other uses
- Protecting and enhancing Natural Resources

Plans and Costs:

- For scenario A, the team assumed a cost of $73 per ton contract rate for hauling and disposal, which is the City's current contract rate. The Net Present Value (NPV) under this scenario is negative $69,262,000 with a land value of $4,898,000/acre needed to offset reclamation costs.
- For scenario B, the team assumed a cost of $40 per ton disposal and $0.54 per ton mile for hauling, which are book values, if the City cannot use their current contract for this waste. The Net Present Value (NPV) under this scenario is negative $186,614,000 with a land value of $13,198,000/acre needed to offset reclamation costs.
- For scenario C, the team assumed a cost of $73 per ton contract rate for hauling and dispose with an assumption that 3% of the waste will need to be handled as hazardous material. The Net Present Value (NPV) under this scenario is negative $73,783,000 with a land value of $5,218,000/acre needed to offset reclamation costs.
- For scenario D, the team assumed a cost of $40 per ton disposal and $0.54 per ton mile for hauling with an assumption that 3% of the waste will need to be handled as hazardous material. The Net Present Value (NPV) under this scenario is -$189,692,000 with a land value of $13,415,000/acre needed to offset reclamation costs.

Logistics:

Truck traffic on Highway 1 from Key West to Palm Beach would be an estimate of 80-100 loads per day. Even with a fleet of 80 trucks running, this operation could take approximately 3-4 years to complete. This would result in a high greenhouse gas emission level for the project and possible pushback from the community. (Somewhere between 100,000 and 150,000 truck trips.)

Barge transport of waste to a Palm Beach County area port will reduce the community impact and truck traffic on Highway 1 as well as having the potential of an overall reduction in transportation cost (barge transport is combined with land transport at point of origination and destination).

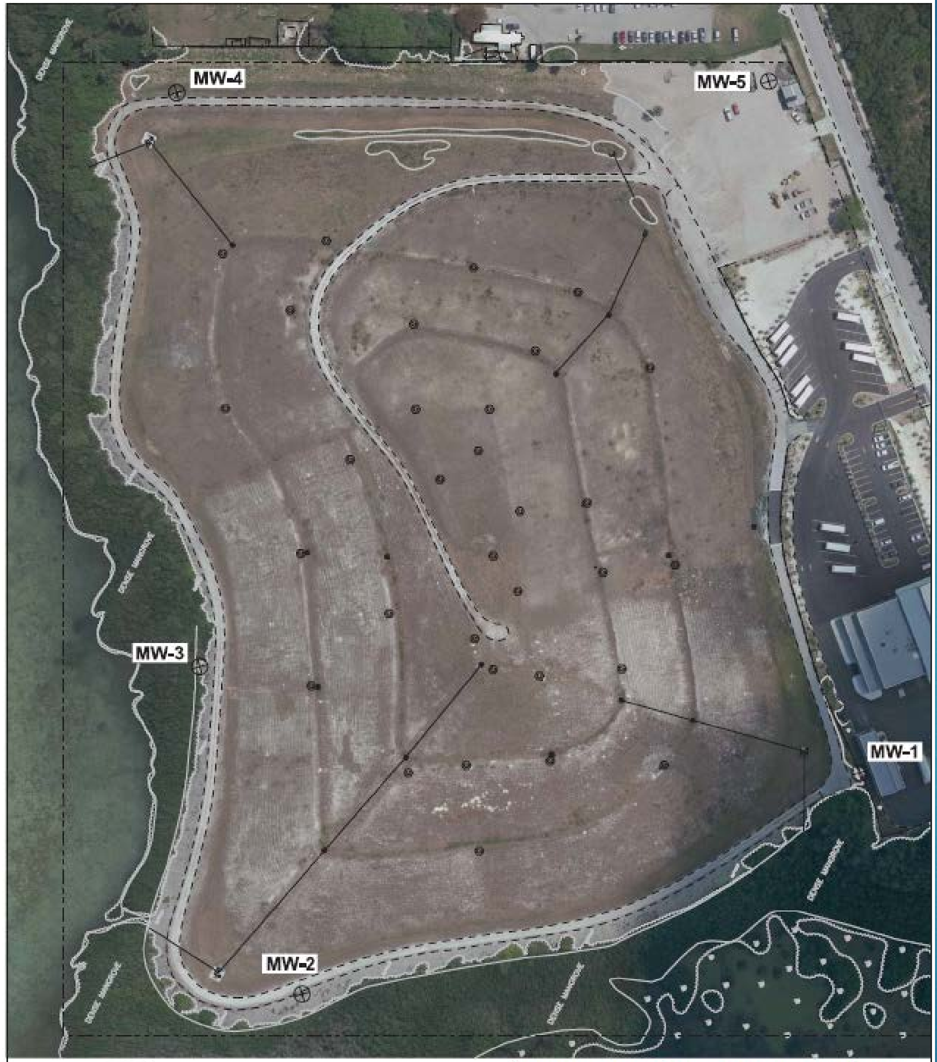


Figure 10: Groundwater Contours December 2015

0 150 300

SCALE IN FEET

KEY WEST STOCK ISLAND LANDFILL
POST-CLOSURE ASSISTANCE
CITY OF KEY WEST, FLORIDA

ch2m

Landfill Mining

https://ensia.com/features/landfill-mining/

Perdido Landfill in Escambia County, Florida

2. History of landfill mining

Savage et al. (1993) reports that landfill mining was introduced in Tel Aviv, Israel in 1953 as a way to obtain fertilizers for orchards. This remained the only reported initiative for several decades (Krook et al., 2012). Increased concerns for impending shortages of landfill space in the United States (US) prepared the stage for further LFM projects as one strategy to regain storage capacities (Kruse, 2015). The first projects in the US were started in Naples, Florida (1986-1992) and Edinburgh, New York (1988). Both were motivated by avoiding and reducing closure costs as well as the environmental footprint of the landfills (US-EPA, 1997). The project in Naples was not only the first one of a series that followed, but also the first one to incorporate a broad range of resource recovery strategies into its design (Kruse, 2015):

i) recover landfill cover material,

ii) using combustible waste as fuel for a close by waste-to-energy facility and

iii) recover recyclable materials.

https://www.researchgate.net/publication/317555059_Landfill_Mining_-_A_Comprehensive_Literature_Review

Arindam Dhar

University of Texas at Arlington | UTA · Department of Civil Engineering

8.3 Negative Environmental Impacts of Landfill

8.3.1 Hazardous waste management

Hazardous wastes may be uncovered during landfill mining. The historical disposal data, if available, could help predict the amount and location of these wastes and can help greatly during the planning of landfill mining. A hazardous waste management plan should be in place before implementing landfill mining operations. Management may include (Ford et al.,2013):

- Development of appropriate human health and environmental risk assessments.
- Development of management plans, including planning for the unknown, e.g. exposure of a waste that was not anticipated.
- Training of staff.
- Provision of appropriate personal protective equipment (PPE) for site workers.
- Provision of appropriate set-aside areas and appropriate containers for storage of waste.
- Provision of migration barriers for dust and potentially windblown material, which could include measures such as water mists/sprays, screens and netting.
- Provision for re-interment of certain wastes elsewhere on the landfill where their exposure presents an immediate risk, e.g. provision for the rapid re-interment of asbestos containing wastes.

Nature and extent of hazardous wastes may substantially affect the cost and efficiency of landfill mining and in extreme cases, may also prevent the landfill mining operation to take place (Ford et al.,2013).

8.3.2 Release of Landfill gas and odor

Methane and other gases (hydrogen sulphide etc.), generated as a result of decomposition, are trapped into the waste and may cause explosion, fires, odour and fatal health risks to human health. To minimize such risks, landfill mining projects are generally undertaken on stabilized waste, typically over 25 years old (Ford et al.,2013). However, the explosive limits of methane is generally between 5 to 15%, whereas landfill gas is generally 50-60% methane, varying on the age and composition of deposited waste (Ford et al.,2013). The gas released from the old waste is rapidly diluted in the open air, but the risk of gas build up and subsequent explosion in confined spaces (closely located facilities, buildings etc.) has to be take into account during location planning and design of any structure close to the mining operation. Gas monitors with alarms are used to monitor levels of gas, including methane, at the location of waste excavation (Ford et al.,2013). Page 57

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8.3.3 Release of leachate and management of surface runoff

Waste excavation will give rise to several issue regarding leachate and surface water runoff problems which need to be taken into account during planning. Some if the issues have been reported below (Ford et al.,2013):

- Adequate drainage and containment facilities should be installed for surface runoff and leachate generated from the stockpile of excavated waste.
- Since waste excavation will lead to a change in the grade of the cell, surface runoff collection system should be reviewed.
- Caution should be exercised so that excavation operation does not damage leachate collection and drainage systems.
- Excavation of final cover or capping material will increase rainwater infiltration and subsequently, leachate generation, which needs to be accounted and managed accordingly. To minimize the leachate generation, exposed waste surface should be kept to a minimum.
- It may be necessary to pump the level of leachate down prior to excavation beneath the leachate or groundwater table to minimize issues associated with excavating and handling of sodden wastes. This would require appropriate management of the pumped liquids.
- In addition to the potential risk of escaping liquids and leachate, management methods for dealing with high leachate or groundwater levels could significantly add to the cost and complexity of the project.

8.3.4 Release of dust

Dust generation results from excavation, waste processing and traffic movement on site. Dust generated from waste processing (separation and sorting) may be possibly contained within the processing facility. Dampening roads by water tanker during dry conditions may mitigate dusts from traffic movement. Where asbestos is, or is expected to be, encountered special measures are likely to be required, such as the use of fine spray mists. Finally, high winds may pose problems and it may be required to suspend operations during these times (Ford et al., 2013).

8.3.5 Subsidence or collapse of cells

Excavation of waste in a cell may create stability problems for adjacent cells, which may subside or collapse into the adjacent excavated cells. Understanding of nature of the waste, including its compaction, presence of voids, variability, stability, moisture content and levels of leachate or groundwater in advance of the mining operation can prevent such catastrophic events. Limiting the depth of excavation for any one lift is likely to be a key management method (Ford et al.,2013). According to Ford et al., (2013):

9.3 Environmental Challenges

Landfill mining involves waste excavation and disposal operations and may have adverse public health and environmental impacts. Following are the possible environmental impacts of landfill mining (RenoSam 2009):

- Air pollution, through the emission of hazardous particulates, fibres and gases
- Surface and groundwater pollution through the discharge of contaminated solids, sludges and liquids
- Transfer of contaminant off-site due to inadequate vehicle decontamination or sheeting of vehicles
- Noise and vibration
- Odours
- Traffic movements and congestion

The severity of these effects depends on a number of factors and the mitigating measures should be consistent with the magnitude of the risks involved, and the scale and extent of the operation. The factors controlling the environmental impact of landfill mining are the following (RenoSam 2009):

- The nature of the contamination
- The scale and duration of the remedial operation:
- Weather conditions;
- The proximity and sensitivity of potential targets such as neighbouring residential populations, surface or groundwater resources and ecologically significant habitats

According to Ford et al., (2013):

"In addition to the above, the operation will give rise to noise, may attract vermin and is likely to involve additional traffic movements on the local road network. In addition to congestion and impact on local air quality, vehicles leaving site could spread mud onto the highway, unless appropriate wheel wash and vehicle washing facilities are available. These are risks that are well understood by landfill operators and regulators, and apply equally to landfilling operations as they do to LFMR operations. 59

Environmental risks can be managed if considered in advance of the operation and appropriate mitigation measures designed and implemented in discussion with regulators. Pertinently, these risks would require addressing in an environmental permit application and the regulator, SEPA, would require all risks are identified, appropriately assessed and mitigation measures put in place, where necessary, prior to permit issue and commencement of operations.

When scoping and planning a LFMR project for a specific landfill, it is necessary to fully establish the 'conceptual model' of the landfill and its surroundings. The conceptual model is the full understanding of the waste, the engineered structure of the landfill and the surroundings, including potential receptors to pollution, contamination or nuisance. This includes any potential migration pathways within the waste mass and surroundings, such as drains, ditches, buried services, leaks in any liners, permeable soils or faults etcetera in the surrounding geology. It will be necessary to study any available gas, leachate and groundwater quality and water level monitoring results from in waste and perimeter boreholes. This will assist in establishing any possible impacts upon water quality and the local hydrological and hydrogeological regimes."

https://waste-management-world.com/a/landfill-mining-goldmine-or-minefield

LFMR has the potential to create significant localized environmental impacts, health and safety risks and nuisance concerns, bringing potentially dangerous materials to the surface such as asbestos. While mitigation measures can be put in place, the cost of doing so could be prohibitive for some potential projects. These issues will need to be considered on a project-by-project basis, and understanding the content of the target landfill site or cell is critical.

Other Interesting Articles:

https://cen.acs.org/articles/94/web/2016/06/Mining-landfills-resources-doesnt-always.html

Mining landfills for resources doesn’t always benefit climate
Landfill mining may pose greenhouse gas burden in areas with renewable energy and sophisticated waste gas collection systems

https://ensia.com/features/landfill-mining/

Why aren’t we mining landfills for valuable materials like metals and soil?
Published on October 17, 2018 in News

Next Steps: