



Our Mission – To Protect the Health and Environment of all Kansans by Promoting Responsible Choices

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Why Harvest Landfill Gas





EXHA

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But really - why harvest landfill gas

- Early 90s
- Subtitle D hadn't yet been promulgated
- Landfill designs varied from site to site

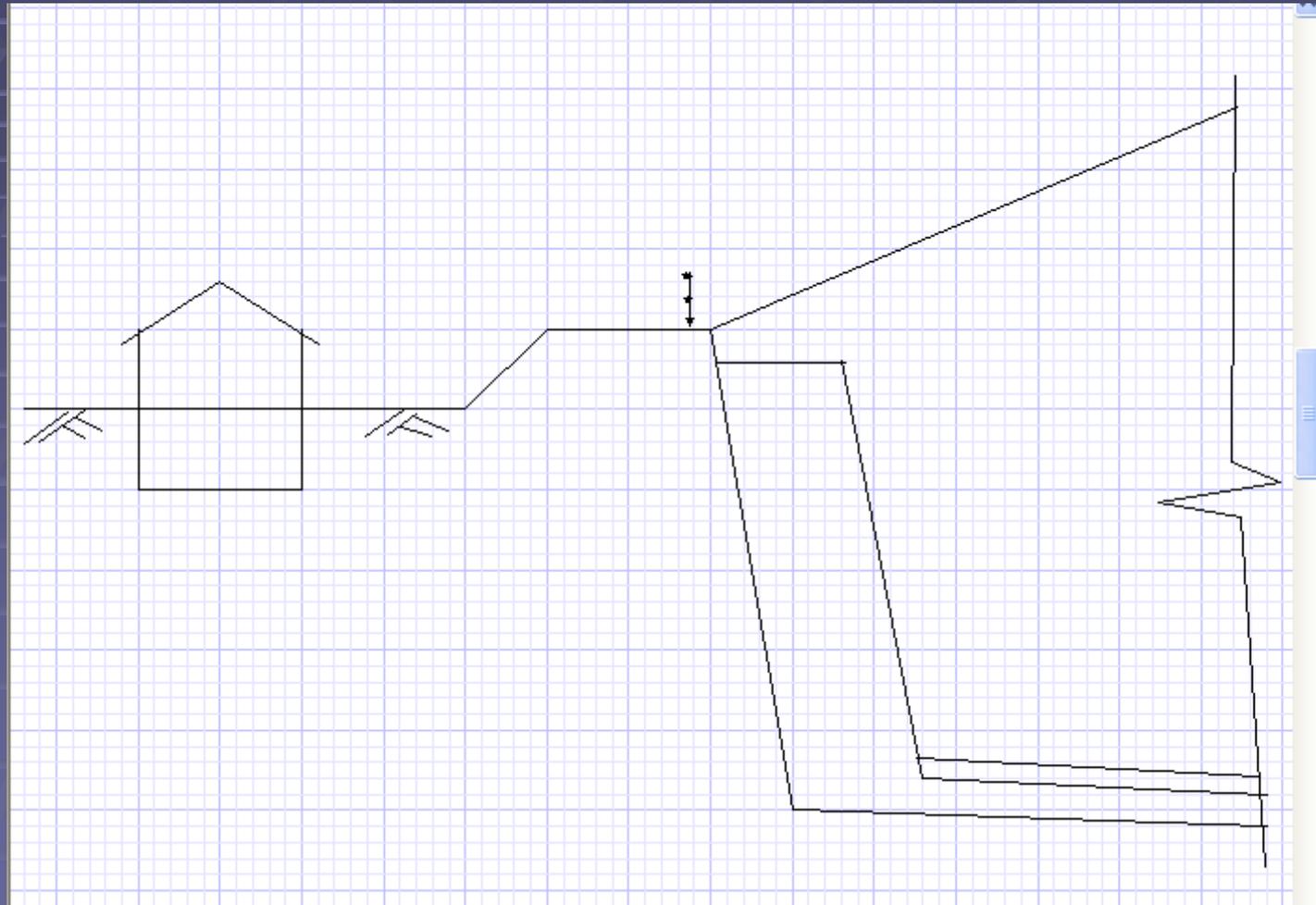
Landfill Design

- One site in Kansas
- 3-foot thick shale liner
- State regulation did not prescribe it
- Then why the liner?
 - To protect groundwater.

Landfill Design

- Along quarry high wall, approximately 10-foot thick sidewall built of compacted shale/clay
- Why this thick ?
- Why the barrier ?
 - To protect against dangerous build-up of methane.

Landfill Gas



Landfill Gas Regulations

- RCRA or CAA
- Federal Register of August 30, 1988 EPA announced that landfill emissions would be regulated under the authority of the Federal Clean Air Act

Landfill Gas

- CAA Proposed Rule May 30, 1991
- CAA Promulgated rule March 12, 1996
- Target for LFG emissions is NMOC ($< 1\%$)
- NMOC contribute to smog and contain trace amounts of suspected carcinogens.
- By controlling NMOC emissions, methane emissions are also controlled
- Collection and Control trigger is NMOC levels
- Surface Methane Monitoring is performed monthly over control area and 500ppm triggers corrective action

Landfill Gas

- Migration Monitoring and Control required by RCRA for methane (CH₄)
- On-site structures – 25 % of LEL
- Property boundary 100% of LEL

Landfill Gas

- Methane
- By-product of anaerobic decomposition
- Colorless
- Odorless
- Tasteless
- Lighter than air
- 5% to 15 % explosive range

Landfill Gas

- Issues
 - Quantity of gas (scfm)
 - Quality of gas (% methane)
- End user
 - Seasonal – greenhouse/heating
 - All year – pottery kilns/boilers
- Location of end user
 - Across the fence
 - 20 miles away

Landfill Gas

- Facilitate
 - Right-of-way issues
 - Coordinate with utility personnel
 - Persevere
 - 1900 scfm flaring
 - 70 scfm – beneficial use

Landfill Gas

- August 2007
- KDHE becomes an LMOP partner
- Joining the program was a step in further “encouraging the development of cost-effective landfill gas projects”.
- Green Energy – Works! ?

Landfill Gas

- Safe Environment – at old unlined cells
 - Chapin site closed in 1989 – 2008 neighbors evacuated because of CH₄ presence
 - Finney County Landfill
 - Johnson County Landfill

Methane

- Safe Environment
 - BRIDGEWATER, Va. (AP) — Exposure to methane gas led to the deaths of four family members and a farmhand, but whether they suffocated from the fumes or drowned in 18 inches of liquefied cow manure may never be known, authorities said. (USA Today - 7/4/2007)

Methane

- Safe Environment

- A welding accident that caused a methane explosion killed a 59-year-old man in south-central Nebraska.
- Nuckolls County Attorney Timothy Schmidt said the body of Michael Karmazin was found Thursday evening north of the workshop where he was working.
- Schmidt said Karmazin had been working near a manure tank that's used to transport liquefied hog manure. Somehow, he ignited methane gas that was in the tank.
- Karmazin's body was thrown about 20 feet, and some metal siding panels were blown off the building.
- Schmidt said the accident is a reminder of how important it is to ventilate the area before welding.
- Karmazin lived in a rural area east of Lawrence, which is about 50 miles south of Grand Island

Leachate

- Solid Waste Regulations require leachate from each unit be sampled annually
- Why ?

Leachate

- The quality of the leachate is an indicator of the degree of stabilization of the solid waste.
- It also tells us how much gas generation potential exists in that cell from which the sample was collected.

Discussion Points

- Why was NMOC the NSPS trigger that was chosen ?
- Renewable Energy ?
- Carbon Credits ?
- Renewable Energy Credits ?
- Greenhouse Gas ?
- Is it right for your site ?

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