Anchorage Regional Landfill Leachate Minimization Project

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| Anchorage Regional Landfill |

(aka ARL)

- Operating since 1987
- Municipal Solid Waste for all Anchorage Municipality
- 300,000 tons per year
- 137 out of 166 acres active
- Remaining Life – 25 years

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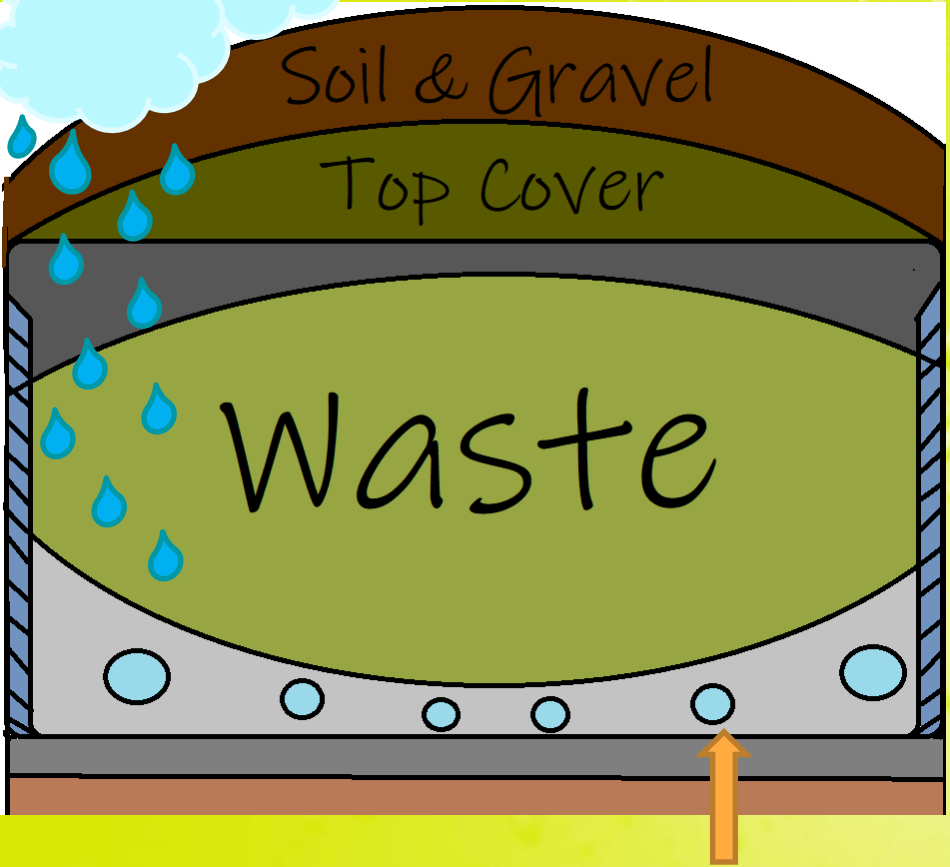
| Landfills & Leachate |

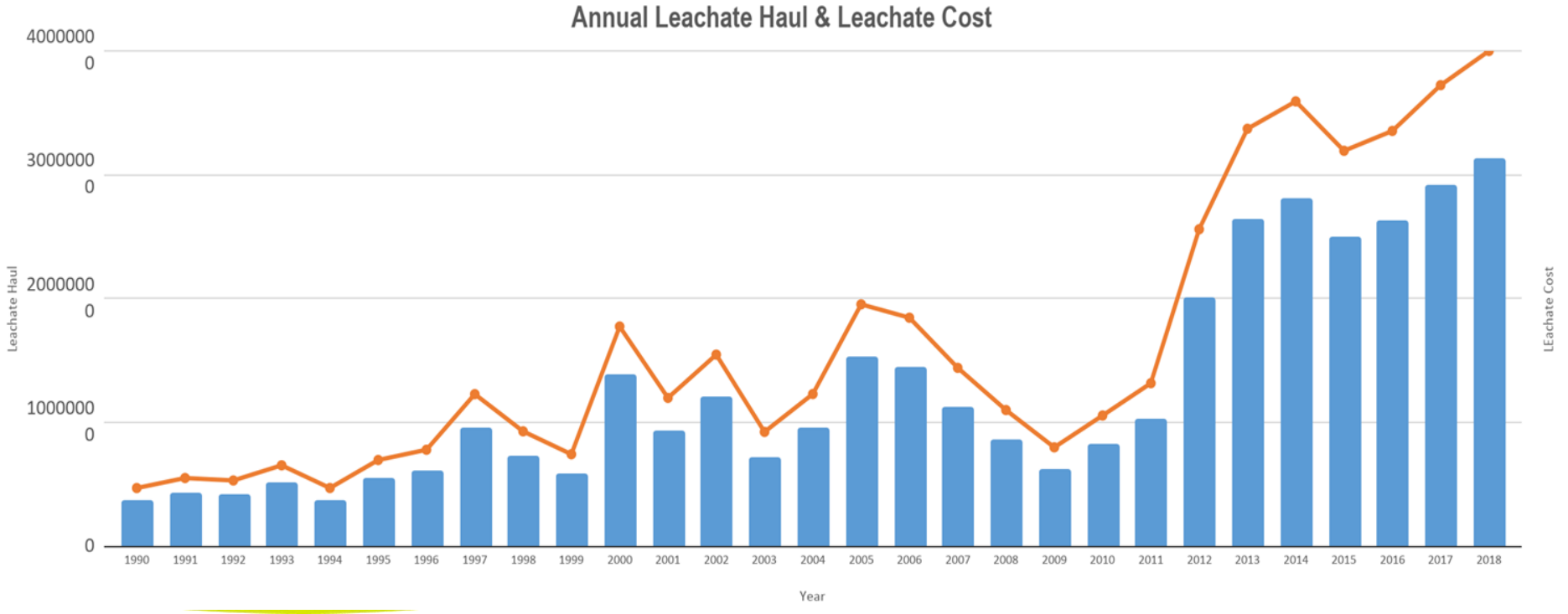


- Carefully engineered structure
- Landfill layers
- Leachate Cycle
- Precipitation & Water content are main contributors

Leachate collection piping networks

|Anchorage Regional Landfill's Leachate Problem|

- ➔ Past 32 Years: 370 million gallons total leachate generated & $16 million for transport & treatment
- ➔ Next 25 Years: $34-$40 million projected



|Why Leachate is Everyone's Problem|

- Anchorage Regional Landfill – Municipality owned
- ARL is the ONLY landfill servicing Greater Anchorage Area
- Hauling method cannot continue
- Waste was generated by US

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| Project Objective |

Reduction of Leachate Generation

- Assessing Alternatives
- Selecting a Design Alternative
- Operational Plan
- Leachate Reduction Estimates

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|Project Methodology & Approach|

Two objectives:

1.

Minimization of Leachate at ARL

2.

Utilization of On-Site Materials

➔ Two Facility Actions

1.

Alternative Cover with Recycled Materials

2.

Public Awareness Campaign

|Recommended Facility Action A|

Reduce leachate generation →Reduce permeability of Side Slopes

- Street-sweepings for smooth surface on slopes
- Spray waste latex paint
- Prevents approx. 32% precipitation that becomes leachate

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|The Experiment|

- Test effectiveness of paint for reducing permeability
- Boxes with interior screens matching exterior slope
- Rainfall simulated
- Runoff → “Precipitation”

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|The Box|

Wire Screen & Mesh cover

Box 1 Painted Gravel and Street Sweepings:

Paint Thickness	50 mil
Precipitation	5.96 L
Runoff	1.91 L
% Diverted	32%

- ✓ Smooth slope
- ✓ Minimal Sloughing

Box 2 Previously Painted Gravel

Paint Thickness	75 mil
Precipitation	5.76 L
Runoff	0.21 L
% Diverted	3.65%

- ✓ Rough slope surface
- ✓ No sloughing observed

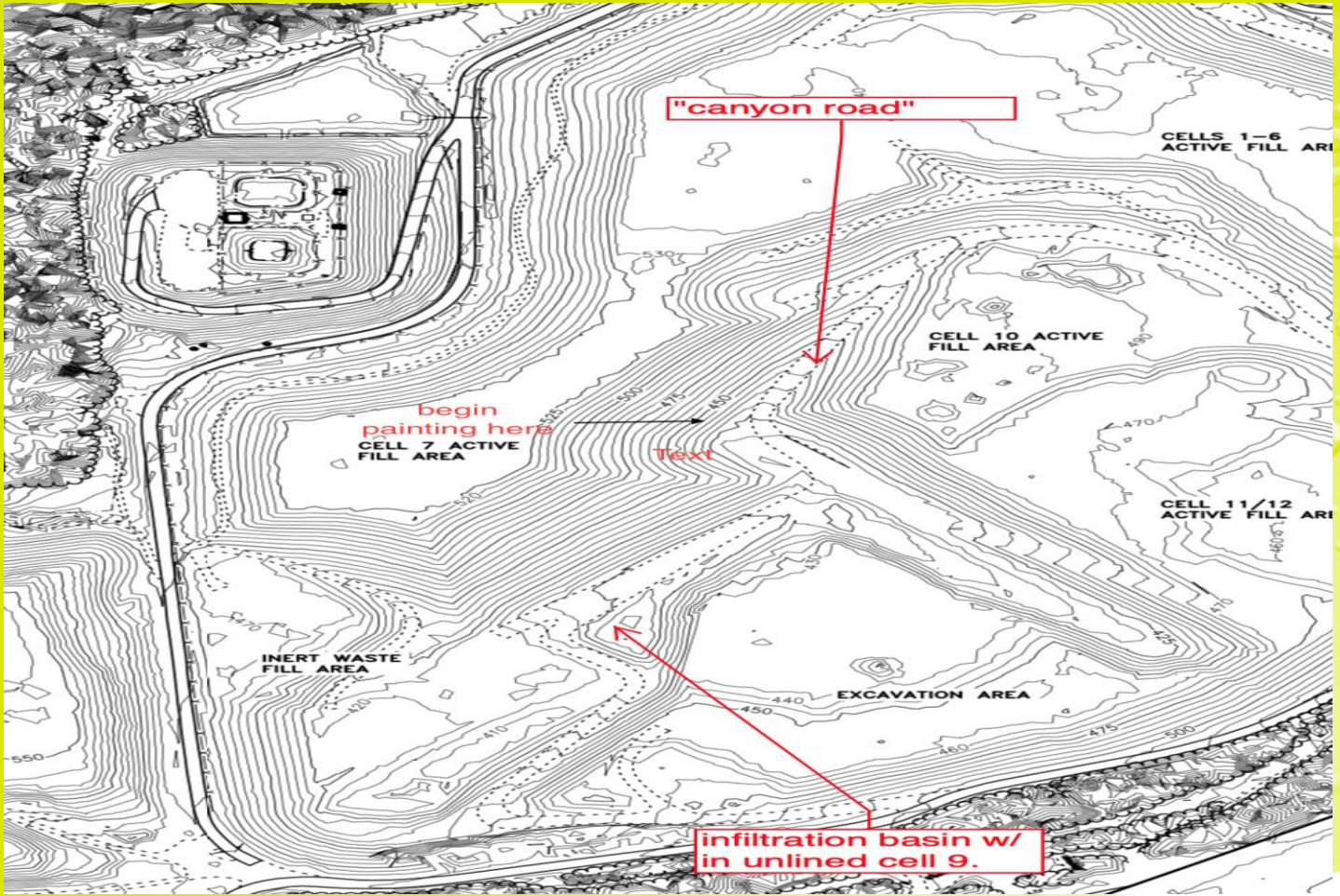
|Experiment Conclusions|

- Use gravel as a base layer and street sweepings on top to create smooth surface
- Apply paint in layers to prevent sloughing
- Paint should be applied to a thickness of at least 50 mil

|Timeline of Application|

- Landfill receives about enough material to paint **4 acres/yr**
- **10 years** to completion
- Start in spring when the bulk of street sweeping material is delivered
- Paint should be applied in warm weather

|Application Area|



|Cost Analysis|

Cost Estimates			
Machine to Apply Paint			$70,000
Labor Estimates			$16,000
Labor	$1600/year	x 10 years	
Estimated Completion Requirement			$86,000

- ➔ Using Recycled Waste Materials
  - Latex Paint Intake
  - Street Sweepings Intake
- ➔ Costs generated include Labor & Specialized Machinery

|Projected Leachate Savings|

- 25% total leachate from seepage through slopes
- Slopes absorb 211,000 gal leachate per acre currently
- **Painted slopes** should absorb **67,000 gal leachate** per acre

	Cumulative Leachate Saved	Cumulative Savings
Year 1 (4 acres painted)	574,000 gal	$25,000.30
Year 5 (20 acres painted)	8,600,000 gal	$379,000
Year 10 (36.75 acres painted)	**31,00,000 gal**	**$1,400,00**

|Recommended Facility Action B|
Reduced Liquid Waste Campaign

Help reduce liquid in landfill (3 ways)

What if? 1:2 (residential:commercial)

= **2% waste decrease**

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Public Outlook

Overall **positive** response from Feb. 2018 survey of 500 customers:

-60% **composting**.

-**Education** requests

-Mandatory **recycling**

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Comparing Similar Strategies

Example: Recycling and Organics Commercial Waste Reduction Program

= $25,000-40,000

-Our proposed campaign: **63% less $**

-Minimal impact on disposal capacity of SWS and MOA

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Cost

15,000 customers:

-**$500** insert

-**$300** Graphic design

-**$500-$1000** radio PSAs, 3-5 billable hours

1 year plan total = **$7200** to **$9200**.

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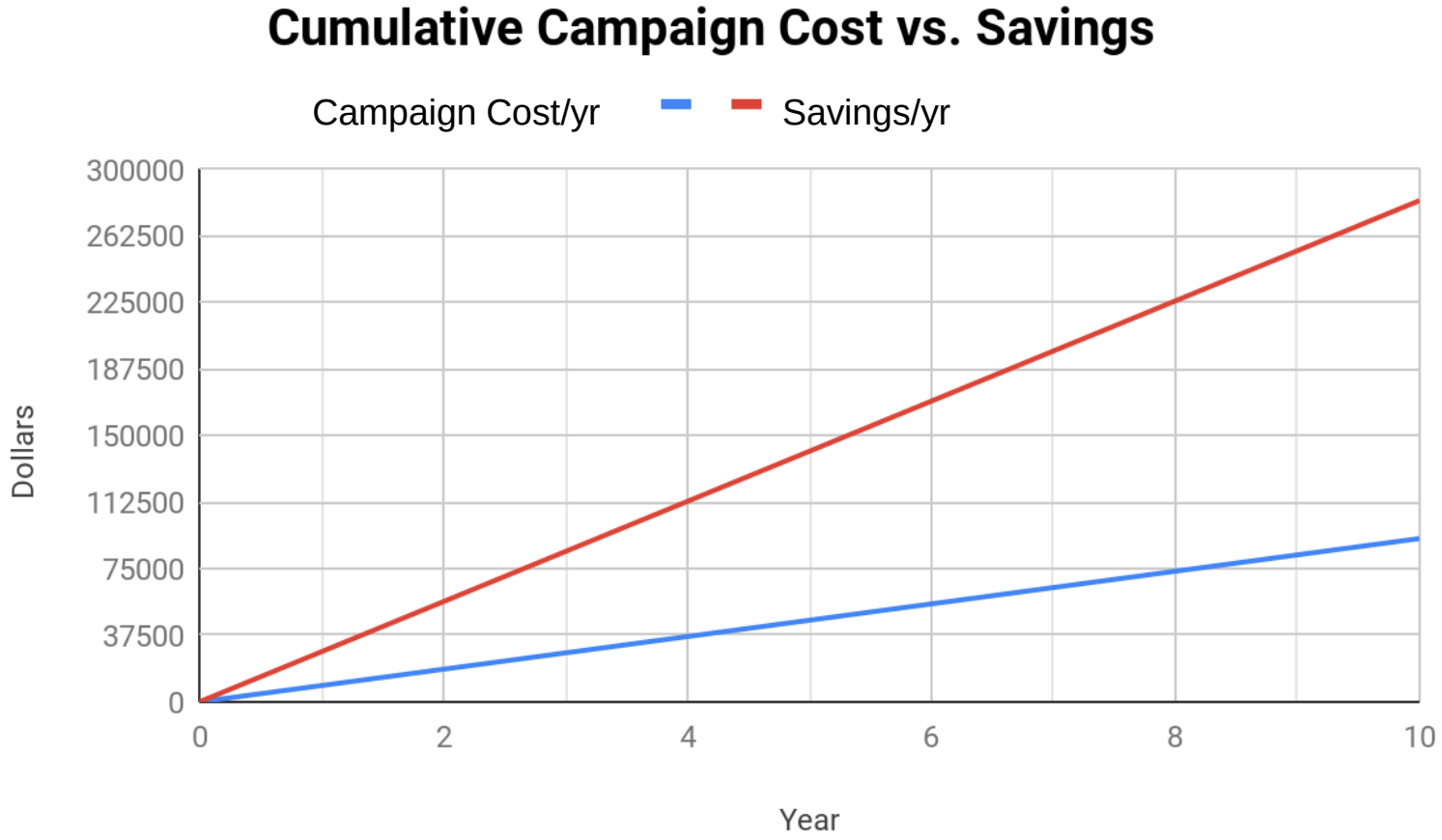
$28,230 per year saved With a **$9,200** campaign



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Why?

“Once the water is in, it’s there forever.”

-Target sources of liquids in ARL: precipitation & SWS customers.

-Reduce leachate production by **2% (minimum)**

-Preventative measures: **Reduce the annual leachate hauls** and ultimately **extend landfill life.**

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|Internal Company Operations|

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- Initial Hour Estimate – 85 Hours
- Initial Project Cost Estimates - $5,000

- Halfway Hour Estimate – 100 Hours
- Halfway Project Cost - $31,000

- Final Hour Total – 210 Hours
- Final Project Cost - $20,000

Facility Recommended Actions

➔ Combination of both actions reduces the most leachate

➔ Ensures happy & involved stakeholders

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