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Implementing the New Landfill Gas Monitoring Regulations in Unusual or Unique Settings

Scott Walker, PE, CEG

Gino Yekta, CIWMB

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Presentation Points

- ✓ Purpose of Landfill Gas (LFG) Monitoring
- ✓ What Changed?
- ✓ Compliance Timetable
- ✓ LFG Monitoring Program Plan
- ✓ Compliance Boundary
- ✓ Types of Alternative Requests
- ✓ What have we learned so far?
- ✓ Where are we now?

What is the Purpose of LFG Monitoring?

- ❑ Detect LFG migration;
- ❑ Determine compliance with migration standard; and
- ❑ Evaluate effectiveness of LFG control system.

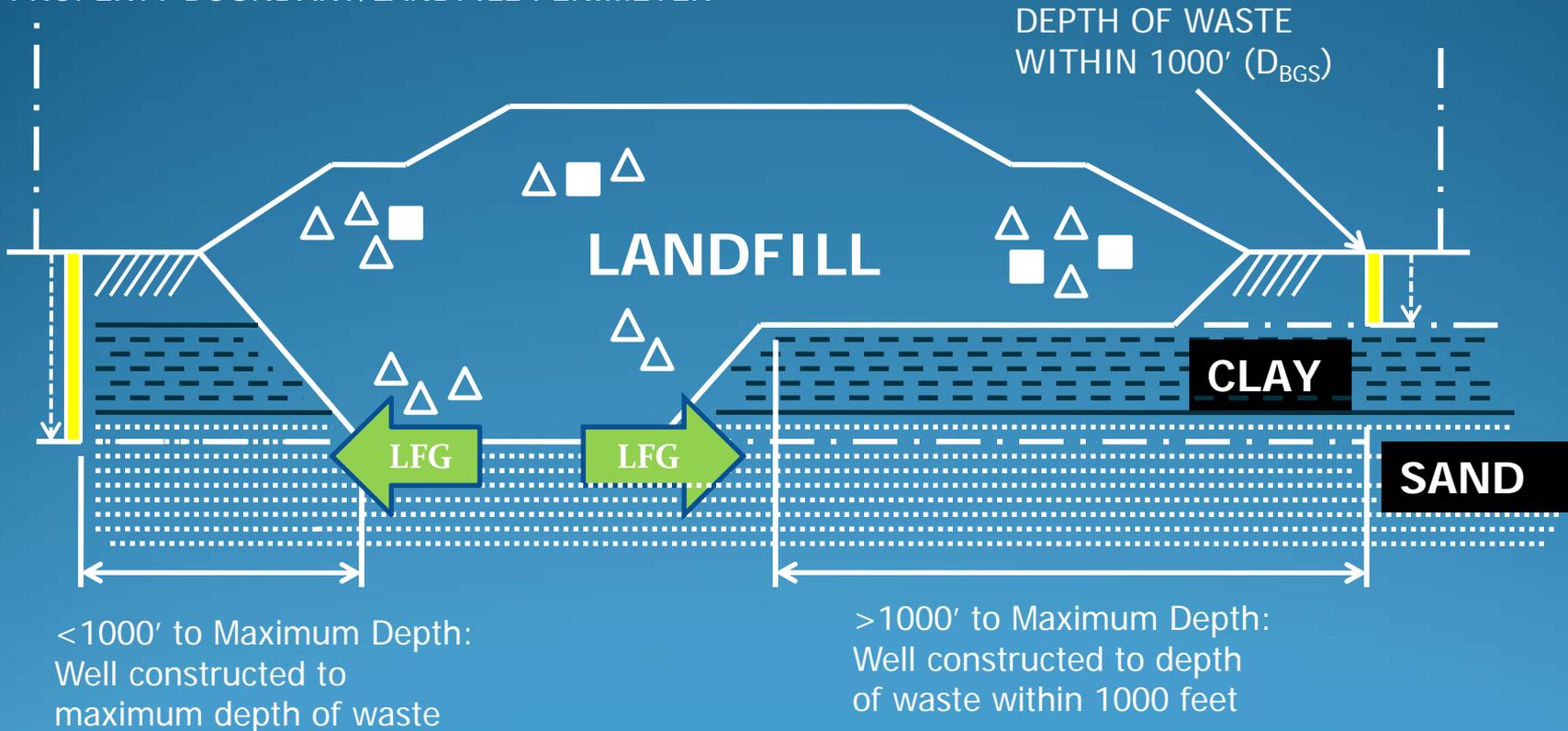
What Changed?



27 CCR 20925(c)(1): The depth of the well bore of all monitoring wells shall equal the maximum depth of waste.

DEPTH OF GAS WELL WITHIN 1000 FEET OF MAXIMUM WASTE DEPTH ON-SITE

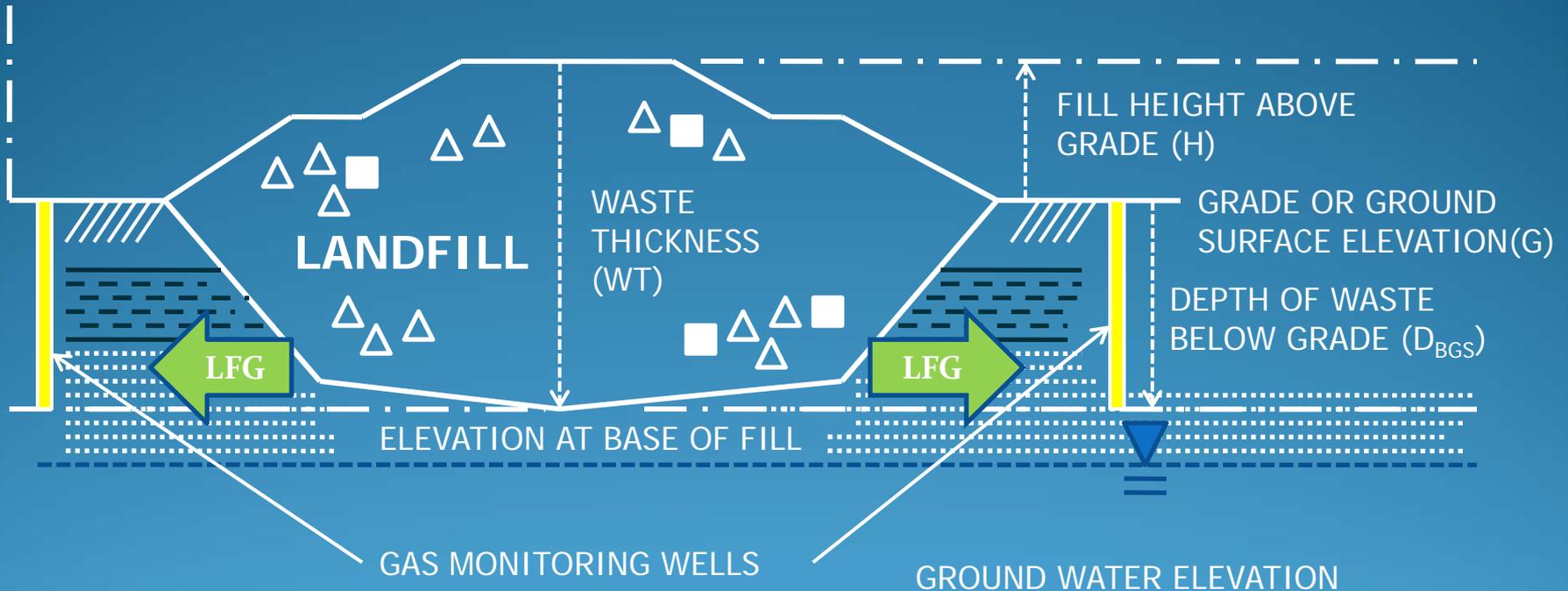
DESIGNATED FACILITY BOUNDARY, A.K.A.
PROPERTY BOUNDARY/LANDFILL PERIMETER



NOTE: Consideration for existing active landfills where wells were constructed to standards at the rim

NEW LANDFILL GAS MIGRATION DIAGRAM AND TERMS

DESIGNATED FACILITY BOUNDARY, A.K.A.
PROPERTY BOUNDARY/LANDFILL PERIMETER



Timeline - 27 CCR, Section 20921

- ❑ Landfills permitted to receive > 20 TPD shall fully implement approved Plans by **October 18, 2009**
- ❑ Landfills permitted to receive $< \text{ or } = 20$ TPD shall fully implement approved Plans by **September 21, 2010**

Section 20923 – Monitoring

A gas monitoring and control program must satisfy the following requirements:

1. The monitoring network shall be designed by a PE or PG
2. The monitoring network shall be designed for:
 - Local hydro-geological, hydraulic & soil and rock conditions;
 - Location of buildings and structures relative to the disposal area;
 - Adjacent land use and inhabitable structures within 1,000 feet of the permitted facility boundary;
 - Man-made pathways such as underground construction; and
 - Nature and age of the waste and its potential to generate LFG.

Section 20925

Perimeter Monitoring Network

- ❑ Perimeter probes shall be located around the permitted property boundary.
- ❑ Perimeter probes can be located at an alternate compliance boundary closer to the waste.

Section 20925- Perimeter Monitoring Network – continued

Spacing:

1. Lateral spacing between monitoring wells shall not exceed 1,000 feet.
2. Spacing of monitoring wells shall be based on the nature of structures protected & proximity to refuse. In some cases, the spacing might be much less than 1,000 feet
3. Spacing between wells is measured around the property boundary and/or alternate boundary...*not through the fill!*

Section 20925- Perimeter Monitoring Network – continued

Depth:

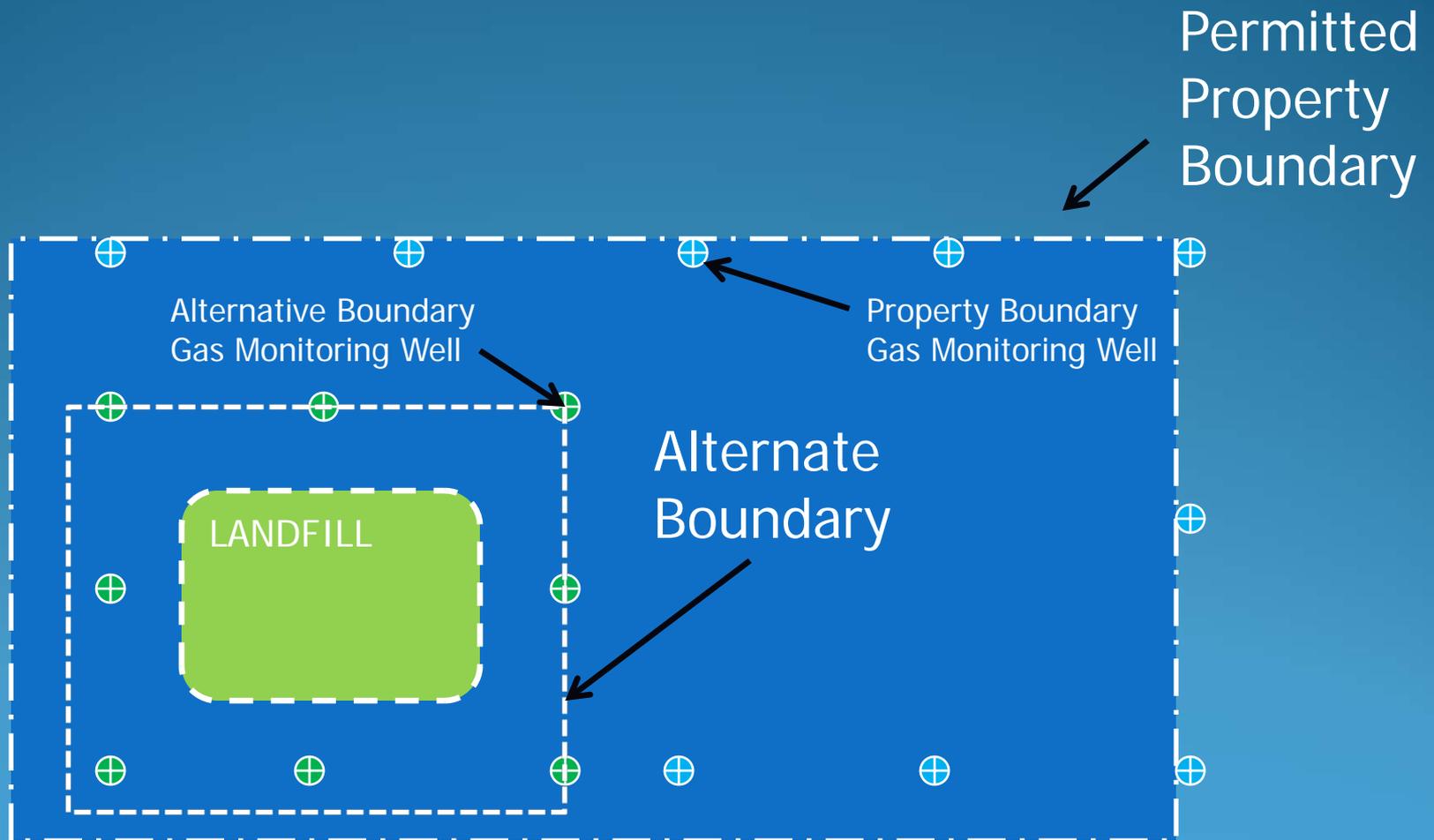
1. Shallow / Intermediate / Deep
2. Two probes required when the depth of waste does not exceed 30 feet
3. Probes shall be placed:
 - *Above seasonal low water table;*
 - *Above and below perched ground water;*
 - *Above bedrock; and*
 - *Screens shall be in soil strata that is permeable to gas migration.*

Compliance Boundary

- ❑ Does not have to be at the permitted boundary
- ❑ May be closer to the landfill footprint



Plan View of Alternate Boundary Example



General Alternative Request Review Approach

- Take statements at face value.
- Determine if statements support alternative criteria.
- Evaluate if statements are supported by site specific data.

Types of Alternatives

Alternatives Include:

1. Location
2. Spacing
3. Depth

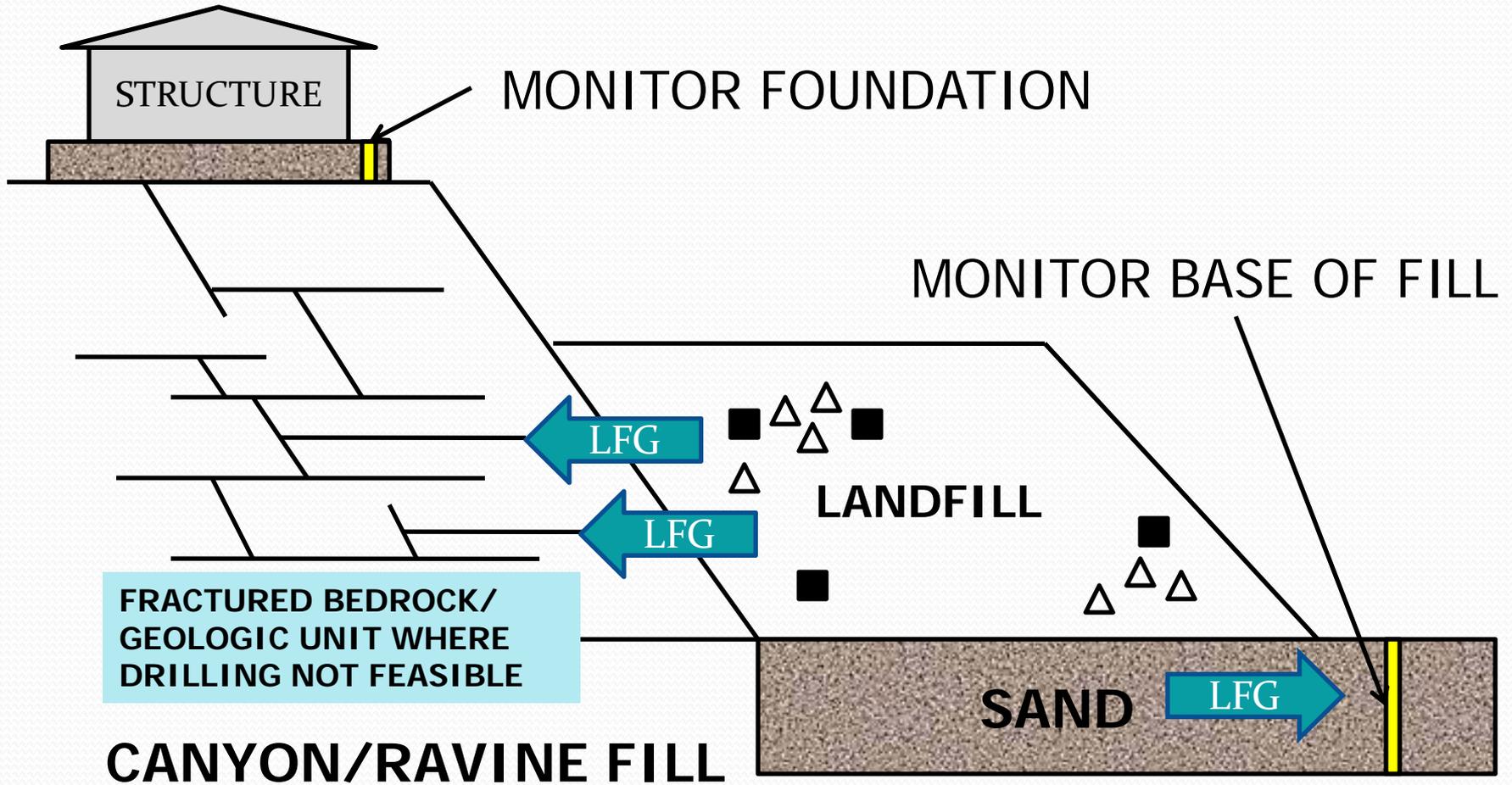
To request an alternative option, sufficient supporting data is submitted to demonstrate proposed alternative meets criteria.

Location Alternative

- ❑ LFG migration could *NOT* occur
- ❑ Due to barriers (geologic/hydro-geologic)
- AND
- ❑ No inhabitable structures or other property or land use within 1,000 feet of the permitted facility boundary threatened by LFG migration

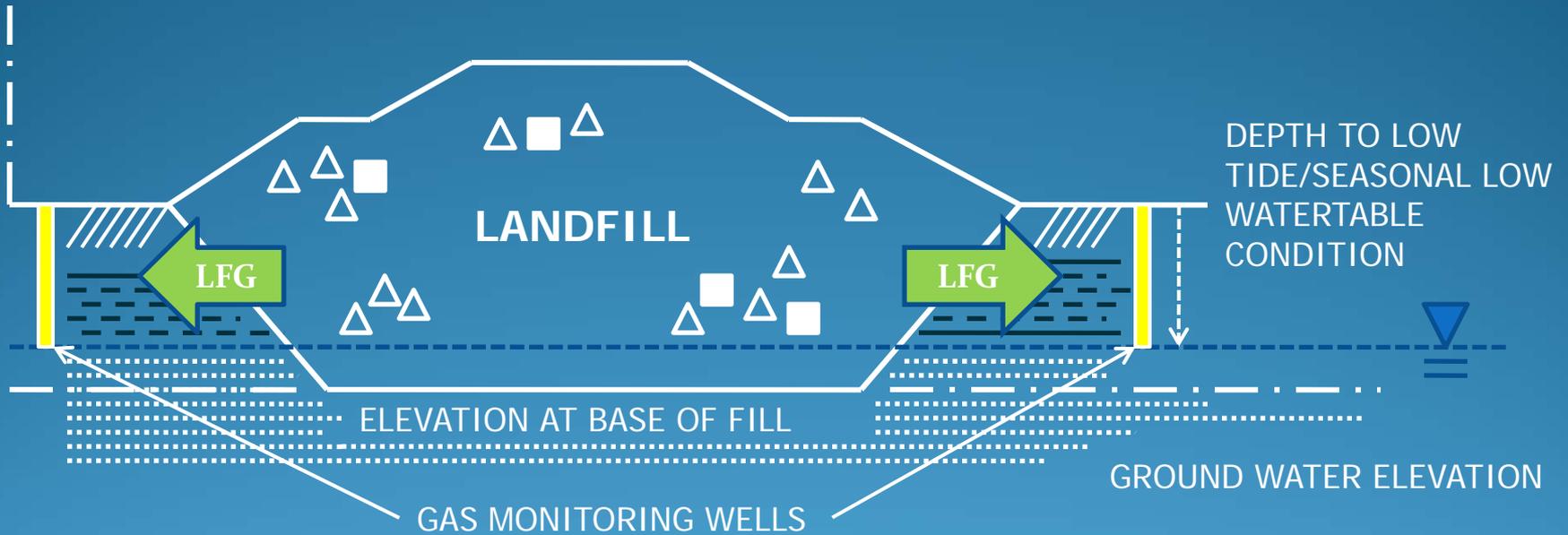
**Example – site boundary contiguous with bay*

CANYON/RAVINE FILL



WATER TABLE IN FILL/TIDAL AREAS

DESIGNATED FACILITY BOUNDARY, A.K.A.
PROPERTY BOUNDARY/DESIGNATED LANDFILL PERIMETER



Spacing Alternative

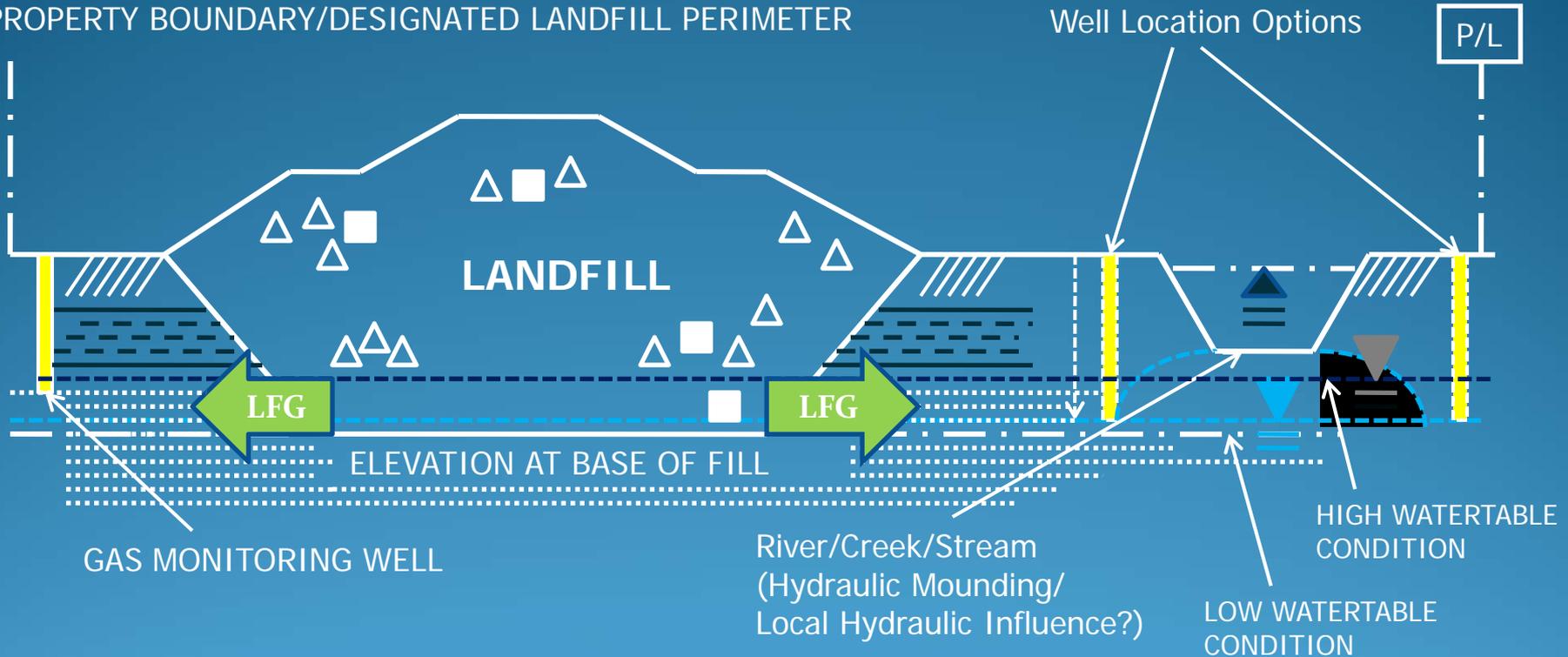
- ❑ No potential for adverse impacts on Public Health & Safety and the Environment
- ❑ Similar to Location Alternative
- ❑ Spacing could be <1,000 feet
- ❑ Surrounding land use/receptors
 - Existing
 - Proposed/zoned

Depth Alternative

- ❑ Conditions limit practicality or do not warrant installation
- ❑ Operator proposes alternate system of depths
 - Demonstrate alternative depths sufficient to detect LFG
- ❑ Subsurface geology
 - Preferential pathways
 - Barrier
 - Ground water
 - Bedrock
 - Provide protection to Public Health & Safety and the Environment.

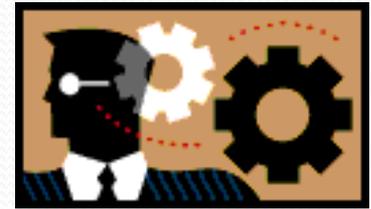
RIVER/CREEK/STREAM CONDITION

DESIGNATED FACILITY BOUNDARY, A.K.A.
PROPERTY BOUNDARY/DESIGNATED LANDFILL PERIMETER



Note: If creek or water table hydraulic influences cannot be adequately determined, e.g. seasonal water table elevation is uncertain; err to the side of safety and install gas well to depth of waste; construct wells during seasonal low water table condition, e.g. Central Valley = Summer or Fall

What Have We Learned So Far?



- ❑ Alternatives do exist;
- ❑ Exemption happens; and
- ❑ The process could not have been accomplished without cooperation among the LEAs, operator, consultants and CIWMB staff.

Where Are We Now ?

Total number of sites to comply = 161 (149 >20tpd & 12 < or = 20tpd)

Sites receiving exemptions = 9

Sites installing new gas compliance wells = 122

Sites with approved alternative depths = 71

Sites with approved alternative spacing/locations = 33

The End



Thank you!