

Carbon Isotope Source Tracking – Aquifer/Groundwater Assessment

Purpose: Confirm conclusively ecosystem gas source during microbial degradation processes.

Example: Is CH₄ at the site below originating from the remedial amendment carbon or residual TPH related to former fuel USTs located downgradient of the treated area? Anaerobic biodegradation of TPH being enhanced by nutrients *et cetera* emanating from up-gradient treatment areas.

Sample Locations ▲ (minimum):

1. Amendment / treatment area (blue area)
2. Area of excessive CH₄ production (red area)

Sample Size/Containers (each location):

1. Stable carbon and radiocarbon – 500 ml Wheaton serum vials. No head space.

Groundwater Sampling Method:

Draw groundwater samples using a low-flow pneumatic pump. Fill 500 ml Wheaton vial 3x volume with running overflow. Fix samples with 2 ml saturated copper sulfate solution (will be provided). Cap with air tight Teflon-lined septum. Immediately place on blue ice.

Shipping:

Standard Chain-of-Custody. Overnight courier. Sealed cooler, blue ice, not frozen.

Analytical Program:

1. Stable carbon methane from amendment area (control)
2. Stable carbon methane from area with excessive CH₄ production (focus site)
3. Stable carbon dioxide from amendment area (control)
4. Stable carbon dioxide from area with excessive CH₄ production (focus site)
5. Radiocarbon methane from amendment area (control)
6. Radiocarbon methane from area with excessive CH₄ production (focus site)
7. Radiocarbon carbon dioxide from amendment area (control)
8. Radiocarbon carbon dioxide from area with excessive CH₄ production (focus site)

Cost:

1. Sample preparation, \$200/sample, \$400 Total
2. Stable carbon isotope analysis methane \$50/sample, \$100 total
3. Stable carbon isotope analysis carbon dioxide \$50/sample, \$100 total
4. Radiocarbon isotope analysis carbon dioxide \$500/sample, \$1,000 total
5. Radiocarbon isotope analysis methane \$500/sample, \$1,000 total
6. Shipping, Data interpretation and Reporting – \$1,300
7. **TOTAL - \$3,900**

Contact Information:

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