INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT	**STATUS:** Effective	**POLICY NUMBER:** WASTE-0073-NPD	
AGENCY NONRULE POLICY DOCUMENT **SUBJECT:** Addressing Methane at Anaerobic Bioremediation Sites	**AUTHORIZED:** Bruno L. Pigott, Commissioner		
	SUPERSEDES: New	**ISSUING OFFICE(S):** Office of Land Quality, Science Services Branch	
	ORIGINALLY EFFECTIVE: December 10, 2021	**RENEWED/REVISED:** Date N/A	

Disclaimer: *This Nonrule Policy Document (NPD) is being established by the Indiana Department of Environmental Management (IDEM) consistent with its authority under IC 13-14-1-11.5. It is intended solely to provide guidance and shall be used in conjunction with applicable rules or laws. It does not replace applicable rules and laws, and if it conflicts with these rules or laws, the rules or laws shall control. Pursuant to IC 13-14-1-11.5, this policy will be available for public inspection for at least 45 days prior to presentation to the appropriate State Environmental Board and may be put into effect by IDEM 30 days afterward. If the nonrule policy is presented to more than one board, it will be effective 30 days after presentation to the last. IDEM also will submit the policy to the Indiana Register for publication.*

1.0 PURPOSE

This NPD identifies anaerobic bioremediation site methane production monitoring and mitigation information, for use when required for remedial actions and removal under IC 13-25-5-8.5, IC 13-11-2-185, and IC 13-11-2-187. The methane monitoring process and screening level recommended in this NPD may be modified per site-specific situations in accordance with receptors' potential exposures.

2.0 SCOPE

This NPD applies to development and review of voluntary anaerobic bioremediation work plans for compliance with IC 13-25-5-8.5(c).

3.0 SUMMARY

This NPD identifies, in Appendix A Addressing Methane at Anaerobic Bioremediation Sites, various monitoring methods for determining the concentration of methane and mitigation methods for reducing receptors' potential risk from exposure.

4.0 DEFINITIONS

4.1. "Agency" – The Indiana Department of Environmental Management (IDEM).

4.2. "Anaerobic bioremediation" – Process whereby microorganisms use a chemical other than oxygen as an electron acceptor to biodegrade contaminants in soil and groundwater.

4.3. "Environmental consultant" – Person providing technical, legal, or procedural advice regarding environmentally related statutes, rules, requirements, or processes while under a compensatory arrangement.

4.4. "Methane" – The predominant explosive gas produced by waste decomposition.

4.5. "Mitigation" – An approach used to reduce the severity of something, such as vapor migration.

4.6. "Nonrule policy" – The term assigned by the Indiana Department of Environmental Management (IDEM) to policies identified in IC 13-14-1-11.5 as any policy which: A. Interprets, supplements, or implements a statute or rule; B. Has not been adopted in

compliance with IC 4-22-2; C. Is not intended by IDEM to have the effect of law; and D. Does not apply solely to the internal IDEM organization, an administrative policy.

4.7. "OLQ technical staff" – Positions requiring specialized knowledge pertaining to a particular occupation or field of study such as chemistry, geology, engineering, and risk assessment.

4.8. "Receptors" – An individual (for example, residential adult, residential child, worker, trespasser, or recreator) who has the potential to be exposed to a chemical in environmental media.

5.0 ROLES

5.1. Environmental consultants:

A. May use this NPD when designing or conducting anaerobic bioremediation.
B. Determine the potential concentration of methane generated in environmental media.
C. Determine whether a project meets the identified remediation objectives.

5.2. OLQ technical staff:

A. Review voluntary remediation work plans using the methane monitoring techniques identified.
B. Evaluate and make recommendations regarding the mitigation method proposed by the consultant depending on the site-specific situation.

6.0 POLICY

6.1. Use this NPD when designing or conducting anaerobic bioremediation.

6.2. A determination of the need for mitigation must be made.

6.3. IDEM shall review the anaerobic work plans and remedy proposals.

6.4. IDEM shall evaluate and make recommendations for work plans and remedy proposals on their merits.

6.5. Use this NPD in conjunction with the Remediation Closure Guide, the Risk-based Closure Guide, or then-applicable current guidance.

7.0 REFERENCE

7.1. Indiana Statutes:

A. IC 13-11-2-185 Environment, Definitions, Definitions, Remedial action http://184.175.130.101/legislative/laws/2020/ic/titles/013/articles/010/

B. IC 13-11-2-187 Environment, Definitions, Definitions, Removal http://184.175.130.101/legislative/laws/2020/ic/titles/013/articles/010/

C. IC 13-14-1-11.5 Environment, Powers and Duties of Department of Environmental Management and Boards, Duties of Department, Use by Department http://184.175.130.101/legislative/laws/2020/ic/titles/013/articles/010/

D. IC 13-25-5-8.5 Environment, Hazardous Substances; Voluntary Remediation of Hazardous Substances and Petroleum; Voluntary remediation work plan objectives; additional action to protect human health and the environment not necessary under certain circumstances; risk-based remediation objectives and proposals http://184.175.130.101/legislative/laws/2020/ic/titles/013/articles/010/

7.2. Indiana Rules:

A. 329 IAC 10-20-17 Solid Waste Management Division, Article 10, Solid Waste Land Disposal Facilities, Municipal Solid Waste Landfills; Operational Requirements, Explosive gases

7.3. Agency Policies:

A. Remediation Closure Guidance
https://www.in.gov/idem/cleanups/files/remediation_closure_guide.pdf

7.4. Other Sources:

A. (USEPA 2015) OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air; OSWER Publication No 9200.2-154

B. (USEPA 2008) Engineering Issue: Indoor Air Vapor Intrusion Mitigation Approaches; Publication No. EPA/600/R-08/115

C. (USEPA 2006) Engineering Issue: In Situ and Ex Situ Biodegradation Technologies for Remediation of Contaminated Sites; Publication No. EPA/625/R-06/015

D. (USGS 2006) Methane in West Virginia Ground Water; USGS Fact Sheet 2006-3011

E. (IDEM 2007) Indiana Department of Environmental Management (IDEM), Office of Land Quality; 2007; Methane Monitoring Program, WASTE_0056-NPD.

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G. Environmental Security Technology Certification Program (ESTCP); 2004; Principles and Practices of Enhanced Anaerobic Bioremediation of Chlorinated Solvents.

H. Wilson, J., M. Toso, D. Mackay, N. de Sieyes, and G. DeVaull. What's the Deal with Methane at LUST Spill Sites? Part 1. New England Interstate Water Pollution Control Commission, Lowell, MA, (71):6-8 and 13, (2012). Available online at: http://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=248336

I. ESTCP; 2006; Protocol for Enhanced In Situ Bioremediation Using Emulsified Edible Oil. ESTCP; 2010; Loading Rates and Impacts of Substrate Delivery for Enhanced Anaerobic Bioremediation; ESTCP Project ER-200627; available online at: http://www.clu-in.org/download/contaminantfocus/tce/TCE-Bio-ER-200627-C&P.pdf

J. Interstate Technology and Regulatory Council (ITRC); 2014; Petroleum Vapor Intrusion; available online at: http://www.itrcweb.org/Guidance/ListDocuments?topicID=13&subTopicID=48

K. Interstate Technology and Regulatory Council (ITRC); 2011; Biofuel: Release Prevention, Environmental Behavior and Remediation; available online at: http://www.itrcweb.org/guidancedocuments/biofuels/biofuels-1.pdf

L. Interstate Technology and Regulatory Council (ITRC); 2007; In Situ Bioremediation of Chlorinated Ethene DNAPL Source Zones: Case Studies; available online at: www.itrcweb.org/Guidance/GetDocument?documentID=11

M. Jewell, K. and Wilson, T.; 2011; A New Screening Method for Methane in Soil Gas Using Existing Ground Water Monitoring Wells; Ground Water Monitoring and Remediation; Volume 31, Issue 3, Summer 2011, pp 82-94. National Ground Water Association, 601 Dempsey Road, Westerville, Ohio 43081-8978

N. Kampbell, D. and Vandegrift, S.; 1998; Analysis of Dissolved Methane, Ethane, and Ethylene in Ground Water by a Standard Gas Chromatographic Technique; Journal of Chromatographic Science; Vol. 36, 253256.

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Q. Steffan, R.; Schaeffer, C.; Lippincott, D.; 2010; Environmental Security Technology Certification Program (ESTCP), Project ER-0515; Bioaugmentation for Ground Water Remediation; available online at: www.clu-in.org/download/techfocus/biochlor/ER-0515-FR.pdf, Department of Defense, Office of the Secretary, The Pentagon, Washington, DC 20301–1155

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8.0 SIGNATURES

Bruno L. Pigott, Commissioner
Indiana Department of Environmental Management

6/18/21
Date

Peggy Dorsey, Assistant Commissioner
Office of Land Quality

6/1/2021
Date

Nancy King, General Counsel

6/8/21
Date

This policy is consistent with agency requirements.

Quality Assurance Program
Office of Program Support
Indiana Department of Environmental Management

21 Jun 2021
Date

9.0 APPENDICES

A. Addressing Methane at Anaerobic Bioremediation Sites