

**BEFORE**

**THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of Duke )  
Energy Ohio, Inc., for an Adjustment to ) Case No. 20-0053-GA-RDR  
Rider MGP Rates. )

In the Matter of the Application of Duke )  
Energy Ohio, Inc., for Tariff Approval. ) Case No. 20-0054-GA-ATA

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**DIRECT TESTIMONY OF**

**SHAWN S. FIORE**

**ON BEHALF OF**

**DUKE ENERGY OHIO, INC.**

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\_\_\_\_\_ Management policies, practices, and organization  
\_\_\_\_\_ Operating income  
\_\_\_\_\_ Rate Base  
\_\_\_\_\_ Allocations  
\_\_\_\_\_ Rate of return  
\_\_\_\_\_ Rates and tariffs  
  X   Other: Manufactured Gas Plant Site Remediation

March 31, 2020

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**I. INTRODUCTION AND PURPOSE**

1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION.**

2 A. My name is Shawn S. Fiore. My business address is 6500 Rockside Road, in  
3 Independence, Ohio. My position is Senior Vice President at Haley & Aldrich, Inc.

4 **Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL AND**  
5 **PROFESSIONAL EXPERIENCE.**

6 A. I earned a Bachelor of Science Degree in Geochemistry from Bowling Green State  
7 University, in Bowling Green, Ohio, in May 1986. I earned a Master of Science  
8 Degree in Geology from Bowling Green State University in August 1993. I am a  
9 licensed Professional Geologist in Indiana and Pennsylvania, and a Voluntary Action  
10 Program (VAP) Certified Professional (CP), in Ohio. I have been a CP since 1996. I  
11 have more than 30 years of experience working in the environmental consulting  
12 industry. I began my career as an environmental geologist for Engineering-Science  
13 Inc. (later Parsons Corporation), in 1988, in Chicago, Illinois, and continued to work  
14 with this company until 2002, when I joined Haley & Aldrich. I have worked  
15 predominantly on environmental investigation and remediation projects during my  
16 career, focusing on Manufactured Gas Plant (MGP) projects for the past fifteen years.  
17 I have completed professional assignments, including investigation and remediation  
18 projects, throughout the United States and in Canada, Mexico and other countries. I  
19 have presented at several professional conferences, seminars and meetings, including  
20 those at the invitation of the Ohio Environmental Protection Agency (Ohio EPA),  
21 Fortune 50 Companies and non-profit groups, as listed in my Curriculum Vitae,  
22 provided as Attachment SSF-1.

1    **Q.    HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY OR TESTIFIED**  
2    **BEFORE THE PUBLIC UTILITIES COMMISSION OF OHIO?**

3    A.    Yes, I filed written testimony and testified during the hearings on behalf of Duke  
4    Energy Ohio, Inc. (Duke Energy Ohio) in the 2012 Natural Gas Rate Case, Case  
5    Nos. 12-1685-GA-AIR, *et al.* (2012 Natural Gas Rate Case) and in 2019 in the  
6    Consolidated Rider MGP Proceeding, Case Nos. 14-375-GA-RDR, *et al.*; Case  
7    Nos. 15-0452-GA-RDR, *et al.*; Case Nos. 16-0542-GA-RDR, *et al.*; Case Nos. 17-  
8    0596-GA-RDR, *et al.*; Case Nos. 18-283-GA-RDR, *et al.*; and Case Nos. 19-174-  
9    GA-RDR, *et al.*, which were consolidated (collectively, the Consolidated Rider  
10   MGP Proceedings).

11   **Q.    WHAT DOCUMENTS HAVE YOU REVIEWED IN THE PREPARATION**  
12   **OF YOUR TESTIMONY?**

13   A.    I have been involved as the CP for the work at the East End site since 2009 and  
14   consulted on VAP issues at the West End site since 2012 and have been serving as  
15   the CP for the West End site since 2019. I am very familiar with the nature and  
16   extent of the work that has been performed by the Company at the two sites and  
17   have reviewed numerous documents that have been prepared in connection with the  
18   investigation and remediation of the East End and West End sites. With respect to  
19   work performed in 2019, documents prepared by Haley & Aldrich in 2019 and  
20   provided in Attachment SSF-2, include the “VAP Phase II Property Assessment  
21   Work Plan for Additional Sediment Investigation of Ohio River” prepared for West  
22   End Site, dated August 2019; the “VAP Phase II Property Assessment Work Plan  
23   for Additional Sediment Investigation of the Ohio River” prepared for the East End

1 site, dated July 2019; “Addendum No. 1 to the Phase II Property Assessment Work  
2 Plan for Additional Sediment Investigation,” prepared for the East End site, dated  
3 September 26, 2019; and the “2018 Groundwater and NAPL Monitoring Report”  
4 prepared for the East End site, dated March 20, 2019. Although I was not as  
5 involved with the investigation and the remediation work at the West End site,  
6 except for the Phase II Property Assessment of the Ohio River, I have reviewed  
7 documents prepared for Duke Energy Ohio by other consultants in accordance with  
8 the Ohio VAP and in my role as a CP. Review of reports prepared by other  
9 consultants is a common practice and expressly contemplated under the Ohio VAP.  
10 In addition to the above, I have also participated in numerous on-site meetings and  
11 conference calls regarding the investigation and remediation work at both sites.

12 **Q. WHAT IS THE PURPOSE OF YOUR PREFILED DIRECT TESTIMONY?**

13 A. The purpose of my direct testimony is to describe Ohio’s VAP, Duke Energy Ohio’s  
14 compliance with VAP requirements with respect to the work performed at the East  
15 End and West End sites, and the prudence of the plans developed and actions taken in  
16 2019, as related to applicable environmental programs, Ohio VAP requirements and  
17 practical considerations.

18 **Q. PLEASE SUMMARIZE YOUR PREFILED DIRECT TESTIMONY.**

19 A. My direct testimony focuses on a description of the Ohio VAP and regulation of  
20 VAP CPs, provides a discussion of VAP applicable standards associated with the  
21 environmental investigation and remediation activities, as relevant to Duke Energy  
22 Ohio’s East End and West End sites, and provides a discussion on the prudence and  
23 reasonableness of investigation and remediation work completed by Duke Energy

1 Ohio in 2019 at these two sites. I previously prepared pre-filed testimony and  
2 provided oral testimony in the past Natural Gas Rate Case and Consolidated Rider  
3 MGP Proceeding. This previous testimony remains accurate today, and this current  
4 testimony will be focused on activities that have occurred since my previous  
5 testimony in 2013 and 2019 involving the two former MGP cleanups at the East  
6 End site and the West End site.

**II. ENVIRONMENTAL REMEDIATION ACTIVITIES**

7 **Q. PLEASE DESCRIBE YOUR EXPERIENCE IN INVESTIGATING AND**  
8 **REMEDIATING CONTAMINATED PROPERTIES.**

9 A. During my approximately 30-plus-year professional career, I have predominantly  
10 focused on investigation and remediation of contaminated sites. I have completed  
11 hundreds of professional assignments on contaminated properties in Ohio and  
12 beyond, including more than 20 Comprehensive Environmental Response,  
13 Compensation and Liability Act (CERCLA) and Superfund Sites (which are some  
14 of the most contaminated sites in the country), more than 50 former industrial  
15 properties or “brownfield sites,” more than 200 active industrial facilities, more  
16 than 100 commercial facilities, several former wood preserving facilities, more than  
17 20 Department of Defense (DOD) facilities and on MGP sites in Ohio,  
18 Pennsylvania, Indiana, and Michigan. Specifically, in Ohio, I have conducted  
19 investigations and remediations on multiple contaminated sites regulated by the US  
20 EPA, including CERCLA and Superfund sites, Resource Conservation and  
21 Recovery Act (RCRA) sites, formerly used DOD sites, hazardous waste landfills,  
22 and other sites. I have conducted investigations and remediations on sites regulated

1 by the Ohio EPA, including active and inactive industrial facilities, landfills,  
2 commercial properties, brownfield sites, residential properties, abandoned /  
3 undeveloped properties, and MGP sites. I have completed investigation and  
4 remediation projects in all five Ohio EPA districts. I have also conducted  
5 investigations and remediations on other contaminated sites in Ohio regulated by  
6 the Bureau of Underground Storage Tank Regulations (BUSTR). I have been  
7 involved with the investigation and remediation of the East End and West End sites  
8 since 2009.

9 **Q. PLEASE DESCRIBE YOUR INVOLVEMENT WITH THE OHIO**  
10 **VOLUNTARY ACTION PROGRAM (VAP).**

11 A. I was certified by the Ohio EPA as a CP in 1996. I have been re-certified by the  
12 Ohio EPA every year since. I have actively participated in the VAP in a number of  
13 ways including practicing as a VAP CP for more than 24 years on more than 50  
14 properties, obtaining recertification annually through participation in ongoing  
15 professional development training as required by the VAP, providing comments  
16 and input to Ohio EPA on proposed rule changes regarding the VAP, participating  
17 in Ohio EPA-led training sessions to enhance my knowledge of the VAP rules and  
18 requirements, working with the Ohio EPA through Technical Assistance to identify  
19 and solve complex project-related issues not directly included in the rules,  
20 participating on multi-disciplinary tasks groups (including Total Petroleum  
21 Hydrocarbons and Background Metals concentrations), participating in and  
22 providing feedback as part of a multidisciplinary stakeholder review process  
23 implemented by the Ohio EPA, and presenting at CP training sessions and other

1 Ohio EPA-led meetings designed to provide additional and ongoing training for  
2 VAP CPs. I have also been contacted by other VAP CPs, working on MGP sites in  
3 Ohio, to provide advice and information on mitigation of MGP-related wastes  
4 under the VAP.

5 **Q. HAVE YOU BEEN INVOLVED IN INVESTIGATING AND**  
6 **REMEDIATING ANY MGP SITES IN OHIO?**

7 A. Yes. I have been involved in investigating and remediating MGP sites in Ohio since  
8 2005. I have investigated more than 20 MGP sites in Ohio and have been involved  
9 in the remediation of eight MGP sites, to date, with two more in the planning or  
10 design stage, which, I believe makes me the CP with the most experience in  
11 investigating and remediating MGPs under the Ohio VAP.

12 **Q. HAVE YOU BEEN INVOLVED IN INVESTIGATING AND**  
13 **REMEDIATING ANY MGP SITES IN OHIO UNDER THE VAP?**

14 A. Yes, the sites indicated in my response to the previous question have been or are  
15 being investigated and/or remediated following VAP rules.

### **III. THE OHIO VOLUNTARY ACTION PROGRAM**

16 **Q. THE COMMISSION'S ORDER IN THE NATURAL GAS RATE CASE**  
17 **DETAILS THE VAP REQUIREMENTS, THE PROCESS OF OBTAINING**  
18 **A NO FURTHER ACTION (NFA) LETTER AND REQUESTING A**  
19 **COVENANT NOT TO SUE (CNS). HAVE THERE BEEN ANY CHANGES**  
20 **TO THE VAP PROGRAM OR PROCESS SINCE YOU PREVIOUSLY**  
21 **TESTIFIED BEFORE THE COMMISSION?**

22 A. No. Information on the VAP's purpose, requirements, process for obtaining a NFA



1 letter and a CNS, as well as how the program applies to the East End and West End  
2 sites is described at length in the Commission's November 13, 2013 Opinion and  
3 Order in the Natural Gas Rate Case (Opinion and Order).<sup>1</sup> Likewise, the  
4 Commission's Opinion and Order provides descriptions of the impact of Ohio rules  
5 and the Ohio EPA cleanup program under the VAP.<sup>2</sup>

6 This information remains accurate today and, as such, I will focus my  
7 testimony on activities occurring during the period relevant to this proceeding. As  
8 described in the Commission's Opinion and Order, because CPs act as agents of  
9 the State within the VAP program, the VAP also contains a comprehensive program  
10 regulating CPs, which includes verification of educational and work experience,  
11 certification criteria, initial and ongoing training requirements (initially and  
12 annually), a determination of professional competence, regulation of conduct, and  
13 other items.<sup>3</sup>

14 **Q. HAVE THERE BEEN ANY RECENT CHANGES TO THE**  
15 **REQUIREMENTS TO BECOME A VAP CP, TO MAINTAIN VAP CP**  
16 **CERTIFICATION, OR TO THE PROFESSIONAL STANDARDS TO**  
17 **MEET THE OBLIGATIONS OF A VAP CP SINCE YOU PREVIOUSLY**  
18 **TESTIFIED BEFORE THIS COMMISSION?**

19 A. Generally, no. The VAP rules undergo regular review and amendment by the  
20 Agency. However, the general criteria to become a VAP CP has not materially  
21 changed from the process that existed in 2012 when I first testified before this

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<sup>1</sup> *In the Matter of the Application of Duke Energy Ohio, Inc., for an Increase in its Natural Gas Distribution Rates*, Case No. 12-1685-GA-AIR *et al.*, (Opinion and Order at 23-31) (November 13, 2013).

<sup>2</sup> *Id.*

<sup>3</sup> *Id.* at 30.

1 Commission and when I testified most recently in 2019. A person must meet several  
2 criteria to become a VAP CP specified in OAC Rule 3745-300-05(A) and (B),  
3 including: (1) hold a bachelor's degree from an accredited school in an appropriate  
4 engineering or science discipline; (2) have 8 years of professional experience  
5 related to cleanup work, including three years as a supervisor or project manager;  
6 (3) possess good moral character; (4) possess the professional competence and  
7 knowledge to perform the tasks required of a CP; and (5) take the initial training  
8 class offered by the Ohio EPA. In order to maintain that certification, specific  
9 criteria must be met in accordance with OAC Rule 3745-300-05(C), including  
10 meeting performance criteria and taking relevant professional development classes  
11 acceptable to Ohio EPA, one half of which must actually be provided directly by  
12 the Ohio EPA. As noted above, I have been a CP since 1996 and have obtained re-  
13 certification every year.

14 **Q. HAVE THERE BEEN ANY CHANGES TO THE VAP REQUIREMENTS**  
15 **TO DETERMINE WHETHER AN NFA LETTER MAY BE ISSUED FOR A**  
16 **PROPERTY SINCE YOU PREVIOUSLY TESTIFIED?**

17 A. As discussed above, Ohio EPA reviews and amends the VAP rules on a regular  
18 basis, but there have not been significant changes to the process for determining  
19 whether an NFA letter may be issued for a property. In order to determine whether  
20 an NFA letter may be issued, the CP must follow the VAP rules to: confirm that  
21 the property is eligible for participation in the VAP; ensure that the property is  
22 investigated in accordance with the VAP rules while utilizing analytical data from  
23 a VAP-certified laboratory; identify all applicable VAP standards; and determine

1 whether all applicable VAP standards have been met, and, if not, ensure that  
2 remediation required to meet applicable standards has been completed. All  
3 information obtained under the VAP must be certified to truth, accuracy and  
4 completeness by way of an affidavit. Once applicable standards have been met, an  
5 NFA letter may be issued for the property by the CP under affidavit. It is also  
6 important to note that the NFA letter applies to the work conducted and conditions  
7 known to exist at the time it is issued. In the event that the CP learns subsequent  
8 to the date that a CP issues an NFA letter that relevant facts, data or other  
9 information existed at the time the NFA letter was issued which indicate that  
10 applicable standards were not met, the CP must: (1) promptly notify the remediating  
11 party, or the owner or operator of the property, if different, that the applicable  
12 standards were not met and of the need to notify the Director of Ohio EPA; and (2)  
13 notify the Director of Ohio EPA that applicable standards were not met if the  
14 remediating party, or the owner or operator of the property, if different, does not  
15 submit written confirmation to the CP within thirty days of learning of the relevant  
16 facts, data, or other information, that the Director has been notified.

17 **Q. WHY IS IT DESIRABLE TO FOCUS REMEDIATION EFFORTS ON**  
18 **OBTAINING AN NFA LETTER?**

19 A. An NFA letter is desirable in that it is written confirmation by the CP that the  
20 environmental condition of a site meets all applicable standards under the VAP  
21 rules for current and reasonably anticipated future land users.<sup>4</sup> The entire VAP  
22 process is focused on meeting applicable standards and the NFA letter serves as

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<sup>4</sup> Id. at 31.

1 documentation that these standards have been achieved. In other words, the NFA  
2 letter is a formal statement by the CP that the property has been investigated and  
3 remediated to meet the State of Ohio's cleanup standards. In addition, an NFA letter  
4 is required to obtain liability relief, if desired, in the form of a CNS from the State  
5 of Ohio. Further, the Ohio EPA offers some enforcement relief for remediating  
6 parties working under the VAP rules and working toward meeting all applicable  
7 standards and ultimately achieving an NFA letter. The Ohio EPA generally will not  
8 issue an enforcement order for properties on which work is being undertaken in  
9 conformance with the VAP.

10 **Q. ONCE A SITE IS EVALUATED, HOW ARE OPTIONS FOR**  
11 **REMEDATION SELECTED?**

12 A. The VAP does not specify or prescribe required remedial options.<sup>5</sup> The VAP sets  
13 forth applicable standards and specifies that all applicable standards, as related to  
14 current and reasonably anticipated land users, must be achieved. The remediating  
15 party, in consultation with the CP, determines the remedial approach required to  
16 meet all applicable VAP standards. Typically, several remedial options are  
17 evaluated in order to select a remedy. These remedial options are often evaluated  
18 with respect to protectiveness of human health and the environment, the long- and  
19 short-term effectiveness and permanence, implement ability, suitability,  
20 compliance (with rules), and costs in meeting these standards. Quite frequently,  
21 several remediation techniques are combined to provide a remedial approach that  
22 allows a site to achieve all applicable standards.

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<sup>5</sup> Id.

1           With respect to the East End and West End sites, Duke Energy Ohio  
2           considered several remedial alternatives at each “phase” of the remediation,  
3           evaluating a number of criteria as noted above. Both the East End and West End  
4           sites were sub-divided into areas or “phases” for purposes of investigation and  
5           remediation, which is a common approach utilized in contaminated site cleanups  
6           and in the VAP, particularly at very large and complicated sites such as these two  
7           sites. These evaluations have been documented in various reports for work that has  
8           been conducted at the sites, which are contained in Attachment SSF-3. The  
9           remedial approach at both the East End and West End sites have followed and  
10          continue to follow the same approach that was used since remediation began at the  
11          two sites, and that was determined by the Commission to be prudent in the Natural  
12          Gas Rate Case.<sup>6</sup>

13   **Q.   HOW IS COST CONSIDERED IN DETERMINING COMPLIANCE WITH**  
14   **THE VAP?**

15   A.   The VAP establishes applicable standards that must be met to allow for issuance of  
16   an NFA letter and a CNS from Ohio EPA.<sup>7</sup> It is up to the remediating party to  
17   determine how best to achieve those standards following the VAP regulations, as  
18   well as to meet other applicable criteria as described above. The VAP allows the  
19   use of different remedial approaches to address a variety of site conditions and  
20   exposure pathways. These different remedial approaches carry with them different  
21   costs. For example, *in situ* stabilization is generally less costly than excavation and,  
22   if used within the appropriate site conditions, is as effective as excavation in

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<sup>6</sup> Id. at 63-65

<sup>7</sup> Id. at 30.

1 meeting specific applicable standards within those conditions. That being said, the  
2 objective of remediation conducted on VAP sites is to achieve all applicable VAP  
3 standards.

4 For the East End and West End sites, the remedial work completed in 2019  
5 (and previously) has included the mitigation of significant volumes of free product  
6 (coal tar) in order to achieve applicable VAP standards. These actions do not only  
7 serve to meet soil direct contact standards, but rather to meet all applicable VAP  
8 criteria, including leaching to groundwater, surface water protection and protection  
9 of groundwater meeting potable use standards (POGWMPUS), for example,  
10 removal or stabilization of the coal tar was necessary. Utilization of other  
11 potentially less costly remedial measures, such as environmental covenants or  
12 surface capping, would allow the site to meet some applicable standards, but not all  
13 applicable standards (particularly those requiring protection of the critical resource  
14 groundwater underlying the sites and the Ohio River) and, thus, by themselves,  
15 would also not be protective of human health and the environment and not be  
16 sufficient to allow for issuance of an NFA letter or a CNS.

17 Although the VAP does not require consideration of cost, cost was one of  
18 the factors that was considered in assessing remedial alternatives at both sites as  
19 reflected in the reports in Attachment SSF-3. Other factors included: protectiveness  
20 of human health and the environment, the long-and short-term effectiveness and  
21 permanence, implement ability, suitability, and compliance with VAP rules. These  
22 are appropriate and customary factors to include in evaluating remedial alternatives.  
23 Based on the reports I have reviewed and the work I have performed, the remedial

1 activities performed at the East End and West End sites were selected based on an  
2 evaluation of these factors, with the focus of meeting all applicable VAP standards.

3 **Q. PLEASE IDENTIFY THE STANDARDS THAT MUST BE EVALUATED**  
4 **TO DETERMINE WHETHER A PROPERTY COMPLIES WITH ALL**  
5 **APPLICABLE VAP STANDARDS SUCH THAT AN NFA LETTER MAY**  
6 **BE ISSUED UNDER THE VAP.**

7 A. In order to prepare an NFA letter for a property, a CP is required to identify all  
8 applicable standards for that property. Applicable standards must be determined for  
9 all chemicals of concern, for all relevant site media (*e.g.* soil, groundwater, soil  
10 vapor, *etc.*) with respect to all current and reasonably anticipated future land use  
11 and exposure pathways determined to be complete.

12 Applicable standards may include, but are not limited to, standards derived  
13 from generic numerical standards (as adjusted for the presence of multiple  
14 chemicals), UPUS, non-potable groundwater use standards, vapor intrusion  
15 screening levels (VISL) and standards, as well as soil leaching to groundwater,  
16 POGWMPUS, comparisons to background conditions, and standards related to  
17 migration or transport of chemicals to surface water and sediment (both human and  
18 ecological), as well as those standards derived through property specific or  
19 ecological risk assessment. As indicated previously, once all applicable standards  
20 are identified and once it is determined that a property meets all applicable  
21 standards, an NFA letter may be issued by the CP under affidavit.

1 **Q. WHAT ARE THE VAP STANDARDS APPLICABLE TO THE EAST END**  
2 **AND WEST END SITES?**

3 A. In general, the standards applicable to these sites are the same standards applicable  
4 to most VAP sites. These standards include: generic numerical standards (as  
5 adjusted for the presence of multiple chemicals); UPUS for groundwater; vapor to  
6 indoor air standards; leaching to groundwater standards; POGWMPUS;  
7 comparisons to background conditions; surface water standards; as well as  
8 standards derived from human health and ecological risk assessments, and others.  
9 Further, the remedial actions selected and undertaken at each site, in and before  
10 2019, have been successful in moving these sites closer to meeting applicable VAP  
11 standards for not just direct contact to soil, but also, groundwater, soil vapor and  
12 other site media. To be clear, the remedial work undertaken to date, including in  
13 2019, are not just soil remedies, but remedies designed to meet all applicable  
14 standards across multiple site media.

15 **Q. HOW HAVE THE REMEDIAL ACTIONS UNDERTAKEN AT THE EAST**  
16 **END AND WEST END SITES MOVED THE SITES CLOSER TO**  
17 **MEETING ALL APPLICABLE STANDARDS FOR ALL SITE MEDIA?**

18 A. The remedial activities completed to date have moved these VAP sites closer to  
19 meeting all applicable standards for soil, groundwater, and soil vapor. Remedial  
20 activities have involved the removal and off-site disposal and in situ treatment of  
21 impacted soil and the *in situ* treatment of mobile MGP residuals, including oil-like  
22 material (OLM) and tar-like material (TLM). The removal and treatment of soil and  
23 mobile MGP residuals, has directly moved the sites closer to meeting all applicable



1 standards related to soil and soil vapor and has worked to eliminate the migration  
2 of chemicals of concern from soil and mobile MGP residuals into critical resource  
3 groundwater, thus moving the sites closer to meeting all applicable groundwater  
4 standards. Further, because the uplands areas contain mobile MGP residuals, which  
5 may act as source material for impacts to the Ohio River, removing and treating  
6 these impacts have also moved the sites closer to meeting all applicable standards  
7 related to protection of the Ohio River and associated sediment.

8 **Q. HAVE THE VAP REQUIREMENTS FOR ADDRESSING MGP**  
9 **RESIDUALS AT A PROPERTY CHANGED SINCE THE NATURAL GAS**  
10 **RATE CASE?**

11 A. No. MGP residuals include, among other contaminants, OLM and TLM, which  
12 contain a number of chemicals, including benzene and polyaromatic hydrocarbons.  
13 The OLM and, in some areas, TLM present at the sites are considered “free  
14 product” as defined by Ohio EPA: “a separate liquid hydrocarbon phase that has a  
15 measurable thickness of greater than one one-hundredth of a foot.” In general, the  
16 VAP assumes that properties with free product exceed the unrestricted potable use  
17 standard (UPUS) for ground water (OAC 3745-300-08(B)(2)(c)). It should be noted  
18 that the presence of OLM and TLM may also exceed other applicable VAP  
19 standards, such as POGWMPUS, leaching to groundwater, vapor intrusion, direct  
20 contact standards, and others.

21 **Q. HAS THE APPROACH FOR REMEDIATING THE EAST END AND WEST**  
22 **END SITES CHANGED SINCE THE NATURAL GAS RATE CASE?**

23 A. No. The approach for remediating the East End and West End sites, in 2019 and

1 previously, has followed the same general process as was described in the Natural  
2 Gas Rate Case and determined by the Commission to be prudent.<sup>8</sup> At the East End  
3 and West End sites, the MGP residuals must be remediated to meet applicable VAP  
4 standards for several reasons. The MGP residuals at the East End and West End  
5 sites have and will impact groundwater in excess of applicable standards.  
6 Moreover, the MGP residuals at the two sites have migrated in the subsurface (for  
7 example, they have migrated down to bedrock at a depth of nearly 100 feet below  
8 ground surface at the East End site), which would likely cause failures of other  
9 applicable standards including POGWMPUS, leaching to groundwater standards,  
10 surface water quality standards, ecological and human health risk-based standards,  
11 off-site direct contact standards, and others, thus making issuance of an NFA letter  
12 impossible without excavation and/or treatment of the OLM and TLM.

13 To be clear, receptors that could be impacted by migration of the free  
14 product (OLM and TLM) at the East End and West End sites include the adjacent  
15 surface water body (Ohio River). Unless controlled, the MGP residuals could  
16 migrate into this surface water body, thus making issuance of an NFA letter not  
17 possible without active remediation. Thus, remedial actions undertaken at both sites  
18 have been successful in moving both sites closer to meeting all applicable standards  
19 for complete exposure pathways identified in soil, groundwater, soil vapor and  
20 other media, as required by the VAP and other environmental cleanup programs.  
21 The remediation work completed at the East End and West End sites has not simply  
22 been a soil remedy, but a remedy that addresses all other site media, as required

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<sup>8</sup> Id. at 63-65

1 under the VAP. The remedies were selected and designed to support meeting all  
2 applicable standards under the VAP.

3 Other potential remedies that would not be sufficient to allow the sites to  
4 meet all applicable standards were not selected, including some of those described  
5 and evaluated in the reports contained in Attachment SSF-3. These insufficient  
6 remedies would include partial remedies, such as implementation of only an asphalt  
7 or concrete cap, implementation of only land use restrictions, or only installation of  
8 an engineering control, such as a soil barrier consisting of two feet of soil. Further,  
9 even combined, these remedies would be insufficient to meet all applicable  
10 standards. Although land use restrictions and engineering controls will likely be  
11 included in the final overall site remedy, in and of themselves, these remedial  
12 activities are insufficient and will not allow these sites to meet all applicable  
13 standards.

14 **Q. HAS THE WEST END SITE BEEN PROPERLY EVALUATED AND**  
15 **REMEDIED BASED UPON THE OHIO VAP REGULATIONS?**

16 A. The VAP is an iterative process in which several rounds of investigation are often  
17 needed to fully evaluate a property. If applicable standards are not met, remediation  
18 activities are then planned such that when these activities are complete, all  
19 applicable standards may be achieved.

20 The iterative investigation and remediation work at the West End site has  
21 been conducted in a manner consistent with those previous efforts at the West End  
22 site as was previously described and found reasonable in the Commission's

1 Opinion and Order.<sup>9</sup> Active remediation of the Phase 3 and Tower Areas in the  
2 uplands at the West End site was completed in 2019. Investigation in the Phase 4  
3 Area was completed and investigation of the adjacent river bank and Ohio River  
4 sediment and site-wide groundwater monitoring are ongoing. Thus, all applicable  
5 standards have not yet been achieved, but substantial progress has been made  
6 toward meeting all applicable VAP standards.

7 The remedial approach that was taken with respect to the Phase 3 and Tower  
8 Areas and the investigation of the Phase 4 Area is similar to the approach that was  
9 taken at other areas of the West End site that the Commission previously found  
10 prudent in the Natural Gas Rate Case. Areas that were impacted with MGP  
11 residuals, including OLM and TLM, were addressed with a combination of  
12 excavation and in-situ stabilization. Based on the documents that I have reviewed,  
13 the investigation and remediation work conducted at the West End site in 2019, was  
14 consistent with previous investigation and remediation work, was prudent and  
15 reasonable, and in conformance with VAP regulations.

16 **Q. HAS THE EAST END SITE BEEN PROPERLY EVALUATED AND**  
17 **REMEDIED BASED UPON THE OHIO VAP REGULATIONS?**

18 A. As is the case with the West End site, the work at the East End site is ongoing and  
19 is being conducted in a manner consistent with those previous efforts at this site as  
20 described and found prudent in the Commission's Opinion and Order.<sup>10</sup> Remedial  
21 work in the Middle Parcel was completed in 2019, except for areas deemed  
22 currently inaccessible by Duke Energy Ohio. Based on the investigations to date,

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<sup>9</sup> Id. at 31-36 and 43-46.

<sup>10</sup> Id. at 36-43.

1 OLM and TLM are present in portions of the Middle Parcel that cannot presently  
2 be accessed and remediated due to the sensitive underground infrastructure and  
3 facilities present at the site that are necessary and integral to the propane peaking  
4 operations conducted at the facility.

5 In developing the remedial approaches for the areas at the East End site that  
6 were addressed in 2019, Duke Energy Ohio has continued to follow the same  
7 general process that it had used to investigate and remediate MGP impacts in areas  
8 of the East End site that were previously addressed. Areas that were impacted with  
9 MGP residuals, including OLM and TLM, have been and continue to be addressed  
10 with a combination of excavation and in situ stabilization. Based on the documents  
11 that I have reviewed and my direct involvement with the East End site, the  
12 investigation and remediation work conducted at the East End site was consistent  
13 with previous investigation and remediation work, prudent and reasonable, and in  
14 conformance with VAP regulations.

15 **Q. WHY DID DUKE ENERGY OHIO ASSESS THE OHIO RIVER BANK AND**  
16 **THE OHIO RIVER SEDIMENTS AT THE EAST END AND WEST END**  
17 **SITES?**

18 A. Results of investigation and remediation activities completed in the uplands areas  
19 to date, on both the East End and West End sites, have indicated the potential for  
20 the Ohio River bank and Ohio River sediments to be impacted by mobile MGP  
21 residuals associated with the respective upland former MGP facilities. Under the  
22 VAP, the extent of all contaminants of concern present on or emanating from a site  
23 must be evaluated to ascertain whether applicable standards, including surface

1 water standards and those standards derived from ecological and human health risk  
2 assessment, have been met for all potential receptors. Thus, these investigation  
3 activities, as required by the VAP, were designed to provide the information needed  
4 to understand site conditions as detailed in VAP Phase II Property Assessment  
5 Work Plans prepared for both the East End and West End sites, as provided in  
6 Attachment SSF-2.

7 Investigation activities, which are currently underway, are being conducted  
8 to determine whether applicable standards have been achieved. These investigation  
9 activities were consistent with past investigation activities conducted at these sites  
10 conducted under Ohio's VAP and were reasonable and prudent based on my  
11 experience and as indicated in the Commission's Opinion and Order.

12 **Q. WHY DID DUKE ENERGY OHIO CONDUCT A REMEDIAL ACTION**  
13 **ALONG THE OHIO RIVER BANK AT THE EAST END SITE AND HOW**  
14 **WAS THIS AREA RELATED TO FORMER MGP OPERATIONS**  
15 **CONDUCTED AT THE SITE?**

16 A. During river sediment investigation and remediation activities in the summer of  
17 2019, an area of impacted material was observed on the East End site river bank  
18 near the Ohio River. These observed conditions were reported by Duke Energy  
19 Ohio to the Ohio EPA through their 24-hour emergency spill hotline and a written  
20 follow up notification was submitted as provided in Attachment SSF-4.

21 As a result of evaluation of this area, it was determined that the material  
22 encountered on the river bank was related to the former MGP operations at the East  
23 End site. Based on this information, Duke Energy Ohio designed and implemented

1 an interim limited remedial action in this area that was reviewed and approved by  
2 Ohio EPA, as summarized in the required 30-day report submitted to the Ohio EPA,  
3 as described in Attachment SSF-5. Based on its evaluation, the Ohio EPA agreed  
4 that the interim limited response was satisfactory and noted that the site was being  
5 investigated and remediated under the VAP. Thus, this work, which was designed  
6 to mitigate MGP residuals related to the former MGP operations, was completed in  
7 a reasonable and prudent manner.

8 This portion of the East End site is part of the former MGP when it was in  
9 operation in the late 1800s to mid-1900s. The low-water mark of the Ohio River  
10 was historically at the Kentucky and Ohio border, which in some places is  
11 approximately 200 feet south of the current low-water mark. The current river bank  
12 and riverbed in this area were part of the East End site during its operation as an  
13 MGP before the construction of the Markland locks and dam, which significantly  
14 raised the water level in the River. This is consistent with field observations and  
15 the extent of contamination that has been detected and observed in these areas at  
16 the East End site.

17 **Q. DO YOU BELIEVE THAT THE INVESTIGATION AND REMEDIATION**  
18 **ACTIVITIES THAT DUKE ENERGY OHIO COMPLETED IN 2019, AS**  
19 **WELL AS IN PREVIOUS YEARS, ARE REASONABLE AND PRUDENT**  
20 **IN WORKING TOWARD MEETING ALL APPLICABLE VAP**  
21 **STANDARDS AT THE EAST END AND WEST END SITES?**

22 A. Yes. The activities completed by Duke Energy Ohio at both the East End and West  
23 End sites in 2019 (and in previous years) focused on investigation of upland, river

1 bank and sediment areas to define the presence, extent and magnitude of MGP-  
2 related constituents related to historic MGP operations and the remediation of  
3 specific areas of both sites not meeting applicable VAP standards, including those  
4 areas containing MGP-related wastes, such as mobile free product (OLM). This  
5 work was performed consistent with and as required by the VAP.

6 On the East End site, mobile free product remains in certain portions of the  
7 Middle Parcel, which are currently inaccessible due to essential utility services  
8 associated with the East End Gas Works operations. These areas will need to be  
9 addressed once the sensitive underground infrastructure and propane peaking  
10 facilities can be taken out of service and decommissioned. While investigative and  
11 remediation work in the accessible portions of the uplands areas on both sites have  
12 essentially been completed, the investigation of the Ohio River near both sites is  
13 ongoing.

14 This work, which is consistent with the investigative and remedial activities  
15 determined to be reasonable and prudent in the Commission's Opinion and Order<sup>11</sup>,  
16 were reasonable and prudent to evaluate and mitigate site risks to address Duke  
17 Energy Ohio's liability and to meet all applicable standards under the VAP. These  
18 activities are also consistent with approaches taken at other similarly contaminated  
19 properties. Not all VAP standards have been achieved yet and additional activities  
20 will be needed, including addressing groundwater impacts, defining impacts in  
21 river sediment, demonstrating POGWMPUS has been met, and others, before an  
22 NFA letter can be issued.

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<sup>11</sup> See *Id.* at 63-65.



**IV. CONCLUSION**

1 **Q. WERE THE ATTACHMENTS TO YOUR TESTIMONY PREPARED BY**  
2 **YOU, UNDER YOUR DIRECTION AND SUPERVISION, OR REVIEWED**  
3 **BY YOU IN YOUR ROLE AS A VAP CP?**

4 A. Yes. SSF-1 is my Curriculum Vitae. Confidential SSF-2 includes reports and work  
5 plans prepared by Haley & Aldrich and other consultants under the VAP.  
6 Attachment SSF-3 includes the remedial alternatives analysis reports, one of which  
7 was prepared by Haley & Aldrich and the other by another consulting firm and  
8 VAP CP. SSF-4 was issued by Ohio EPA in response to the report concerning  
9 conditions on the river bank at the East End site. SSF-5 was prepared by Haley &  
10 Aldrich and Duke. All those documents or portions of documents prepared by  
11 Haley & Aldrich were prepared under my supervision and/or direction.

12 **Q. IS THE INFORMATION CONTAINED IN THESE ATTACHMENTS**  
13 **ACCURATE TO THE BEST OF YOUR KNOWLEDGE AND BELIEF?**

14 A. Yes.

15 **Q. DOES THIS CONCLUDE YOUR FILED TESTIMONY?**

16 A. Yes.  
17

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