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ENVIRONMENTAL CONDITIONS IN RESIDENTIAL AREA

Redtail Ranch, Erie, CO

Prepared for

Stratus Redtail Ranch, LLC

Prepared by

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Project Number: DE1075

May 2025

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A. Resume of David J. Folkes, P.E.
B. Resume of Suzanne V. Gabriele

1. INTRODUCTION

This report has been prepared by Geosyntec Consultants, Inc. (Geosyntec) on behalf of Stratus Redtail Ranch, LLC (Stratus) to address certain questions regarding environmental conditions at the Redtail Ranch property in Erie, Weld County, Colorado (Figure 1), where residential development has been proposed, or the "residential area" (see the purple area on Figure 2). We address questions regarding: 1) the potential for unidentified buried waste to be present within the residential area, and 2) the potential for contaminants from the closed Historic Landfill (see the orange areas on Figure 2) to migrate onto the residential area. The qualifications of the principal investigators are provided in Attachments A and B, respectively.

In summary, based on the many investigations that have taken place at and near the property, including investigations and work conducted by Geosyntec and approved by the U.S. Environmental Protection Agency (EPA) and the Colorado Department of Public Health & Environment (CDPHE), we conclude:

- No buried waste is present in the residential area at Redtail Ranch.
- The Historic Landfill associated with the Redtail Ranch property is located on a separate tract from the residential area (the green area on Figure 2) and has been properly closed under CDPHE oversight.
- The closed Historic Landfill includes a buffer area that provides further separation from the residential area.
- No contaminants of concern (COCs) associated with the closed Historic Landfill have migrated to the residential area.
- Additional safeguards, such as 1) implementation of a Materials Management Plan, 2) sub-excavation of soil below the full footprint of all homes, 3) monitoring of groundwater and soil vapors between the Redtail Ranch development and the Historic Landfill to the north, and 4) preemptive installation of radon systems below all future homes, will provide additional protection against any unknown environmental conditions.

In our opinion, the residential area of the Redtail Ranch property has been investigated more thoroughly than most if not all undeveloped properties in the area. Based on the lack of impacts indicated by these investigations, the potential for environmental impacts due to unknown conditions on the property is likely lower than on other undeveloped properties that have not been subject to the same level of scrutiny.

More details and the basis for these conclusions are presented in the remainder of this report.

2. IS BURIED WASTE PRESENT WITHIN THE RESIDENTIAL AREA?

To answer this question, we identified the known locations of buried waste at or near the Redtail Ranch property and evaluated the potential for waste to be buried at unknown locations in the residential area, as discussed below.

2.1 Commercial Landfills

Figure 2 shows the locations of operating and closed landfills located near the Redtail Ranch property, including the:

- Denver Regional Landfill (operating and closed)
- Old Erie Landfill (closed)
- Front Range Landfill (operating)

No portion of these landfills is located on the Redtail Ranch property. The nearest landfill is located 500 feet or more from the residential area. Each is being operated or has been closed with CDPHE oversight. Closure includes the application of engineering and administrative controls to protect the environment around the landfill. CDPHE also requires continued monitoring of environmental conditions at the landfill boundaries (i.e., between the landfills and adjacent properties).

2.2 Historic Landfill

The Historic Landfill is located on a tract of the Redtail Ranch property that is separate from the residential area, and comprises two areas with solid waste (the orange areas on Figure 2) that are now covered by 30 inches or more of clean soil and have been properly closed under CDPHE oversight. The solid waste areas are surrounded by a buffer area (the green area on Figure 2) and, as a result, are more than 100 feet away from the nearest proposed residential properties.

The solid waste in the Historic Landfill was placed and buried during the late 1960s in a small ephemeral stream valley or "draw" that slopes to the west along the north side of the Redtail Ranch property. The extent of solid waste was defined by observations of materials encountered in test pits and soil borings and by geophysical surveys, as part of investigations overseen and approved by the EPA and CDPHE. The solid waste was found to be contained in and consistent with the topography of the draw, i.e., the buried waste pinches out on the sides of the draw.

Drums and adjacent contaminated soils were removed from the Historic Landfill and disposed of at offsite commercial landfills under EPA oversight in 2017 and 2018. Soil remaining in the landfill was treated by injection of oxidants under CDPHE oversight in 2020. The waste remaining in the Historic Landfill, consisting of inert and metal debris, household trash and

commercial trash remaining at two locations in the draw, was capped by at least 30 inches of clean soil (referred to as the east and west caps), as part of landfill closure approved by CDPHE.[1]

A CDPHE-designated buffer area extends at least 100 feet beyond the edges of the east and west caps, as shown by the green area on Figure 2. The combined cap and buffer areas are considered to be Restricted Property and subject to a Notice of Environmental Use Restriction (NEUR), approved and enforceable by CDPHE, which applies use and activity restrictions intended to prevent future contact with the landfill wastes and disturbance to the landfill cover. The residential area is beyond the buffer area and Restricted Property. A road easement south of the buffer area and north of the residential area provides further separation between the residential and the buffer areas.

2.3 Potential for Other Buried Waste Deposits

Several lines of evidence were considered when evaluating the potential for other, unknown buried waste to be present in the residential area (i.e., outside of the Restricted Property discussed above). These lines of evidence included government records, topographic maps, aerial photographs, and investigation reports, as discussed below.

2.3.1 Records Search

A search of EPA, CDPHE, Colorado Energy & Carbon Management Commission (ECMC, formerly Colorado Oil and Gas Conservation Commission), and Weld County records did not identify spills, releases, solid waste disposal, or other environmental impacts or concerns in the residential area.

2.3.2 Historical Aerial Photos

Historical aerial photographs from the period before solid waste was placed in the Historic Landfill (1963) to recent times are shown in Figures 3a and 3b. While evidence of landfilling within the draw at the north end of the Redtail Ranch property (the Historic Landfill) can be seen in the late 1960s (i.e., by comparing the 1953 image to the 1969 and later images), none of the photos indicate landfilling activities within the draws or in other locations on the remainder of the Redtail Ranch property (other than pad and other construction activities for the oil and gas operations within the setback areas shown on Figure 2).

[1] CDPHE approved completion of the soil cap and storm waste controls on February 24, 2025, with the exception of soil revegetation, which is in progress, and fence construction around the east and west caps.

2.3.3 Historical Topographic Maps

Historical topographic maps from the time period before solid waste was placed in the Historic Landfill (1950) through recent times (2013) are shown in Figure 4. None of the maps indicate disturbance to ground surface contours that might have resulted from filling of draws or depressions, significant excavations, or mounding within the residential area that might indicate the potential for solid waste placement or burial.

2.3.4 Investigation Reports

Various parties have been assessing and investigating the environmental condition of the Redtail Ranch property since 1984.[2] Since then, 56 soil borings, 3 monitoring wells, and 13 soil vapor probes were installed in the residential area (see Figure 5). None of these installations encountered waste materials or contaminated soil.[3] An additional four, 10-point composite soil samples (40 sampled locations) were collected across the residential area (Figure 5). No indication of waste disposal was observed at any of these locations.

Each block of the residential area shown in Figure 5 was investigated at multiple locations, with no indications of solid waste disposal (other than occasional trash on the ground surface).

2.4 Conclusions

Based on the evidence summarized above, we conclude that no significant deposits of solid waste, if any, are located in the residential area. Any significant deposits would have been reported, and/or encountered by borings, and/or be visible as disturbances on historic aerial photographs or topographic maps.

3. HAVE COCS MIGRATED INTO THE RESIDENTIAL AREA?

To answer this question, we considered the results of assessments and investigations conducted in the residential area by Geosyntec in 2020, which included an evaluation of historic investigations. Based on Geosyntec's findings, CDPHE determined that "*there is no evidence of contamination released into the environment present from the applicant's property, which exceeds applicable promulgated state standards or which poses an unacceptable risk to human health and the environment.*"[4]

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[2] U.S. EPA1984, Site Inspection Report. See References, Section 6.

[3] Geosyntec, 2020. No Action Determination Application, Stratus Redtail Ranch Site, 2259 County Road 5, Erie, Colorado, November 24. This report included an assessment of a neighboring property to the northwest of the residential area, which is not discussed in this report. Nevertheless, CDPHE also approved no further action at this other property.

[4] CDPHE, No Action Determination Approval for 2259 County Road 5, Erie, CO, December 11, 2020.

Further, CDPHE determined that no further action was required "*to assure that this property, when used for the purposes in the No Action Petition (Residential), is protective of existing and proposed uses and does not pose an unacceptable risk to human health and the environment at the site.*"[5]

The lines of evidence supporting these determinations by CDPHE are summarized below.

3.1 Phase I Environmental Site Assessment

Geosyntec conducted a Phase I Environmental Site Assessment (Phase I ESA) of the residential area in 2020.[6] The purpose of a Phase I ESA is to identify Recognized Environmental Conditions (RECs) on a property, based on review of available information, including previous investigations, agency records, public documents, and site reconnaissance. RECs indicate the presence of hazardous substances or petroleum products in environmental media (soil, soil vapor, groundwater, surface water, sediment) above regulatory levels that might require further evaluation or other actions.

The findings of the Phase I ESA did not indicate the presence of any RECs within the residential area.[7] A few "*de minimis"* conditions were noted, including some surface debris in drainages.[8] In other words, no hazardous substance or petroleum product impacts were identified within the residential area by the Phase I ESA.

3.2 Phase II Site Investigations

Several Phase II site investigations have been conducted within the residential area at the locations shown in Figure 5, i.e., by Western Environment and Ecology (WEE 2006), Stewart Environmental Consultants (2007, 2011), Tetra Tech (2007), A.G. Wassenaar (2016), and Geosyntec (2018, 2019, 2020).

The results of these investigations indicated no sources of contamination in the residential area and no impacts to soil, groundwater, or soil vapor due to migration of contaminants from sources outside the residential area (e.g., the Historic Landfill).[9] CDPHE agreed with this conclusion

[5] Ibid.

[6] Geosyntec, 2020. Phase I Environmental Site Assessment, 2259 County Road 5, Erie, Colorado, August 10. The Phase I ESA followed and was in accordance with ASTM Standard Practice E1527-13.

[7] RECs were identified in the Historic Landfill area, which is outside of the proposed residential development.

[8] ASTM defines *de minimis* conditions as those which do not present a threat to human health or the environment or are unlikely to result in enforcement actions if brought to the attention of appropriate governmental agencies. *De minimis* conditions are not considered to be RECs.

[9] Geosyntec, 2020. No Action Determination Application, Stratus Redtail Ranch Site, 2259 County Road 5, Erie, Colorado, November 24.

and determined that no further action was required in the residential area based on this information.[10]

In addition, extensive investigations within the Historic Landfill area over the same time period have confirmed that COCs found in groundwater and soil vapor above levels of concern were confined to the draw and the buffer area.[11]

3.3 Physical Characteristics of the Site

The lack of observed impacts to soil, groundwater and soil vapor in the residential area due to the Historic Landfill is consistent with the local geology, consisting of relatively low permeability clays and silts overlying claystone, siltstone, and fine-grained sandstone of the Laramie formation. Because of the low permeability, shallow groundwater (i.e., in the soil and upper weathered portion of the bedrock) is only found within and tends to follow surface drainage channels at the site.

As a result, shallow groundwater impacted by the Historic Landfill is confined to the draw and flows west away from the residential area, where concentrations decrease below levels of concern due to natural attenuation. Similarly, the low permeability geologic materials impede lateral migration of soil vapors, such as methane, from the Historic Landfill. In most settings, chemical vapors typically dissipate below levels of concern within 100 feet of a source, which was the basis for the minimum 100-foot width of the buffer area.[12]

3.4 Conclusions

Based on the evidence summarized above, we conclude that the residential area has not been impacted by migration of COCs from the Historic Landfill. Even before drum removal, remediation and closure of the Historic Landfill, the impacts of the waste were limited to the draw (within the green area on Figure 2). COCs in groundwater or soil vapor have not migrated from the Historic Landfill into the residential area, despite having being placed in the draw over 50 years ago. Since removal of the drums and contaminated soil from the landfill, injection of oxidants in remaining soils, and construction of the soil caps over the waste, contaminant concentrations and extent in groundwater within the draw have continued to reduce over time.[13]

4. ADDITIONAL SAFEGUARDS

Extensive investigations over the last two decades have indicated that no waste is likely to be buried in the residential area, i.e., no buried waste or contaminated soils are likely to be

[10] CDPHE, No Action Determination Approval for 2259 County Road 5, Erie, CO, December 11, 2020.

[11] Geosyntec, 2020, Corrective Measures Design Report, Historic Landfill Site, Revision 1, May. Approved by CDPHE on May 12, 2020.

[12] In the absence of elevated soil gas pressures, this is typically true for methane as well.

[13] Based on continued and ongoing groundwater monitoring required by the CDPHE-approved closure plans.

encountered by future excavations in the residential area, whether during construction of the homes or later by homeowner activities. Similarly, these investigations have shown that soil, groundwater, and soil vapor in the residential area have not been impacted by migration of constituents from the Historic Landfill, nor are they likely to in the future.

Nevertheless, additional safeguards are already in place or will be provided during development of the residential area, in the unlikely event that buried waste or impacts are discovered in the future.

4.1 Materials Management Plan

Although not required by CDPHE through its No Action Determination, excavation contractors and other parties disturbing the ground during residential development will be required to follow a Material Management Plan (MMP), which will include requirements for identifying and properly managing any contaminated materials or waste encountered.

4.2 Sub-Excavation

All building footprints will be sub-excavated prior to construction to a nominal depth of 3 to 10 feet and backfilled with engineered fill. Sub-excavation is a standard procedure commonly performed in this area to mitigate the potential for swelling soil impacts on building foundations. Sub-excavation will also ensure that no waste is buried below the homes or, if discovered, that it is removed under the MMP and properly disposed.

4.3 Monitoring of Landfill

The CDPHE-approved plans for closure of the Historic Landfill include requirements for monitoring groundwater and soil vapor within the landfill and buffer area during the post-closure period. While no migration of constituents in groundwater or soil vapor is anticipated, the monitoring programs will allow prompt assessment and addressing of migration if it occurs.

4.4 Installation of Radon Systems

We understand that all homes in the residential area will be constructed with preemptive radon mitigation systems, which are intended to control naturally occurring radon gas.[14] While no chemical vapors or methane are likely to migrate from the Historic Landfill to the residential area, radon systems can also control these vapors when present below homes.

[14] Weld County is designated as Zone 1 on the EPA Map of Radon Zones, indicating that the predicted average indoor radon level exceeds the 4 picocuries per liter screening level for mitigation.

5. CONCLUSIONS

Based on the many investigations that have taken place at and near the property, including investigations and work conducted by Geosyntec and approved by EPA and CDPHE, we conclude:

- No buried waste is present in the residential area at Redtail Ranch.
- The Historic Landfill associated with the Redtail Ranch property is located on a separate tract from the residential area (the green area on Figure 2) and has been properly closed under CDPHE oversight.
- The closed Historic Landfill includes a buffer area that provides further separation from the residential area.
- No COCs associated with the closed Historic Landfill have migrated to the residential area.
- Additional safeguards, such as 1) implementation of a Materials Management Plan, 2) sub-excavation of soil below the full footprint of all homes, 3) monitoring of groundwater and soil vapors between the Redtail Ranch development and the Historic Landfill to the north, and 4) preemptive installation of radon systems below all future homes, will provide additional protection against any unknown environmental conditions.

In our opinion, the residential area of the Redtail Ranch property has been investigated more thoroughly than most if not all undeveloped properties in the area. Based on the lack of impacts indicated by these investigations, the potential for environmental impacts due to unknown conditions on the property is likely lower than on other undeveloped properties that have not been subject to the same level of scrutiny.

6. REFERENCES

A.G. Wassenaar, 2016. Geotechnical Site Development Study for Retail Ranch, Northwest of Weld County Road 4 and Weld County Road 5, Erie, Colorado, prepared for Stratus Redtail Ranch, LLC, April 28.

Geosyntec, 2018. Phase I Environmental Site Assessment, Subject Site: Weld County Parcel #146729000043 with Certain Exclusions, Erie Colorado, prepared for Stratus Investment Partners, LLC, July 17.

Geosyntec, 2019. Limited Phase II Environmental Site Assessment Report, Stratus Redtail Ranch 2 LLC, Erie, Weld County, Colorado, prepared for Stratus Redtail Ranch 2, LLC, February 19.

Geosyntec, 2020. Corrective Measures Design Report, Historic Landfill Site, Revision 1, prepared for Stratus Redtail Ranch, LLC, May 1.

Stewart Environmental Consultants (SEC), 2007a. Site Investigation – Property South of Old Erie Landfill, Erie, Colorado, prepared for Southwestern Investment Corporation, July 6.

SEC, 2007b. Supplemental Soil Vapor Investigation – Property South of Old Erie Landfill, Erie, Colorado, prepared for Southwestern Investment Corporation, September 14.

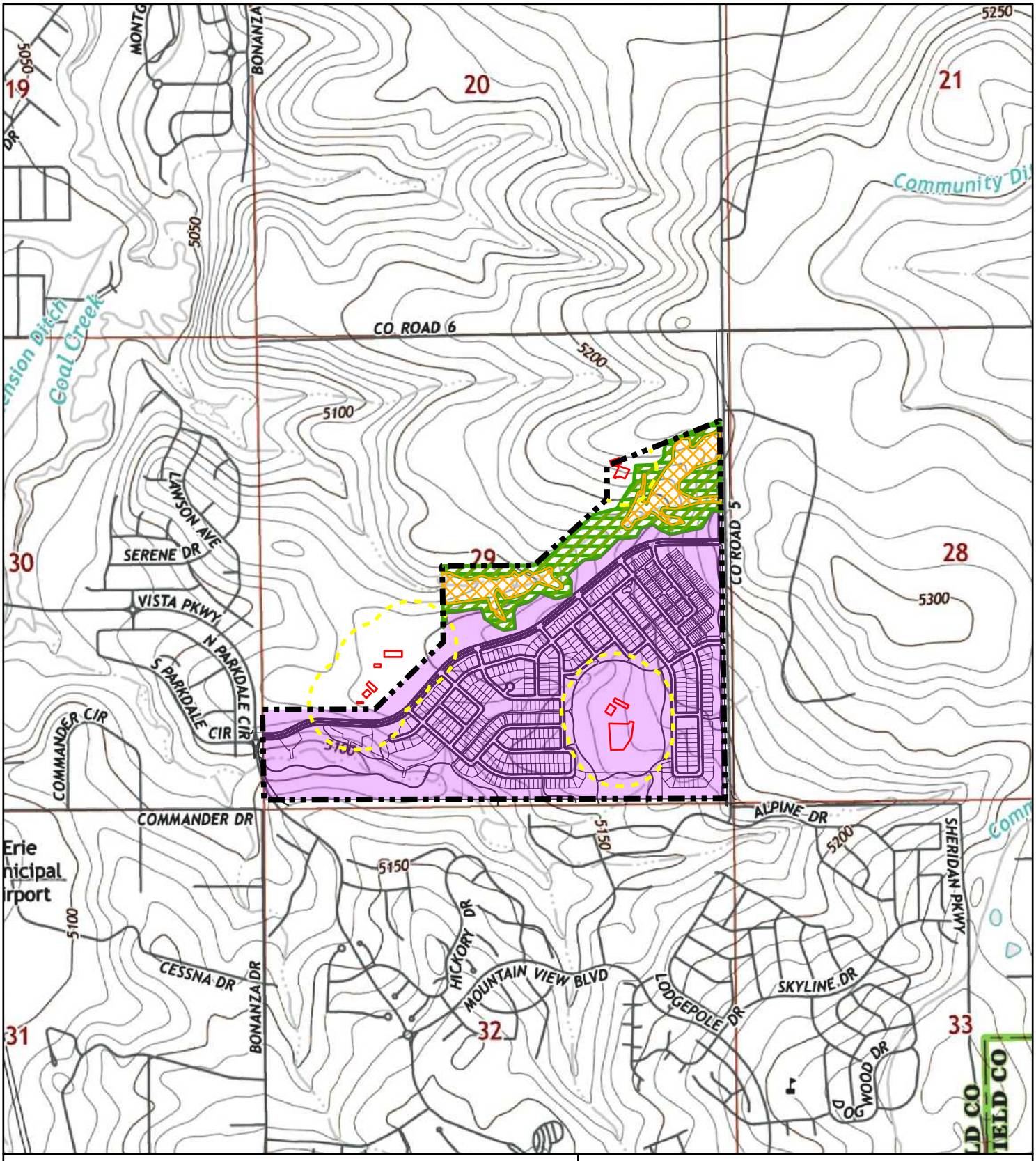
SEC, 2011. Soil Vapor Monitoring – Old Erie Landfill, Erie, Colorado, prepared for Pratt Management Company, LLC, January 28.

Tetra Tech, 2007. Summary Report of Preliminary Site Investigation Activities, Weld County, Colorado, prepared for Southwestern Investment Corporation, February 2.

U.S. EPA, 1984. Site Inspection Report, Columbine Landfill, June 12.

Western Environment and Ecology, Inc., 2014. Mine Subsidence Investigation, Pratt Property, prepared for LAI Design Group, September 19.

FIGURES



Legend

- Active Oil & Gas Location Boundary
- 500 ft Oil & Gas Setback
- Environmental Area (17.30 Acres)
- Planned Development Area
- Environmental Area Setback (28.47 Acres)
- Property Boundary

Notes:
1. Site features are proposed and considered approximate.
2. 2013 Topographic aerial image provided by USGS.

N

0 1,500 Feet

Site Location Map

Redtail Ranch Property, Erie, Weld County, CO

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Figure 1

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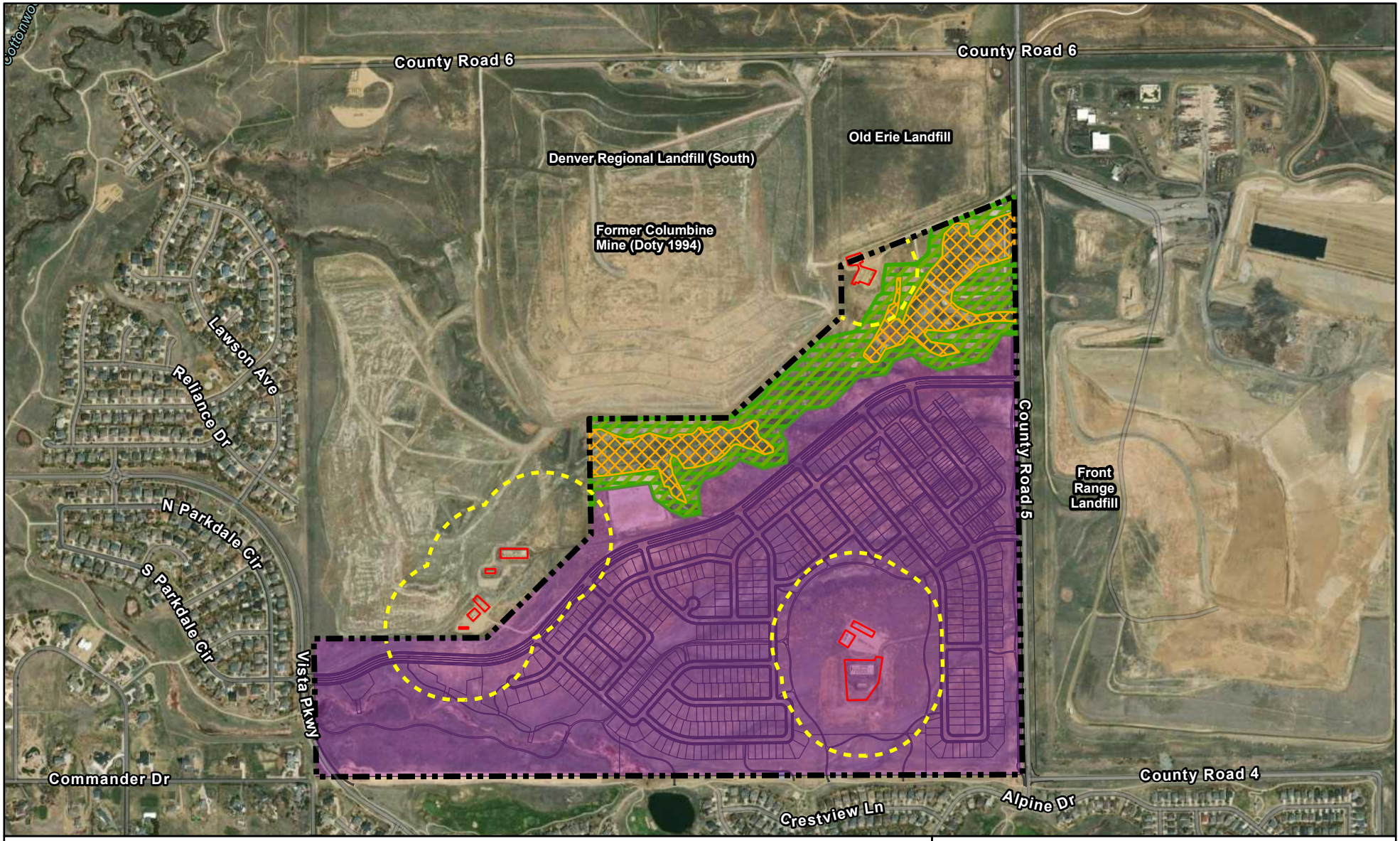

Legend

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- 500 ft Oil & Gas Setback
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- Planned Development Area
- Environmental Area Setback (28.47 Acres)
- Property Boundary

Notes:
1. Site features are proposed and considered approximate.
2. 2023 World Imagery: Maxar.

N

0 1,000 Feet

Site Layout and Surrounding Landfills

Redtail Ranch Property, Erie, Weld County, CO

Geosyntec consultants

DE1075	May 2025	Figure 2

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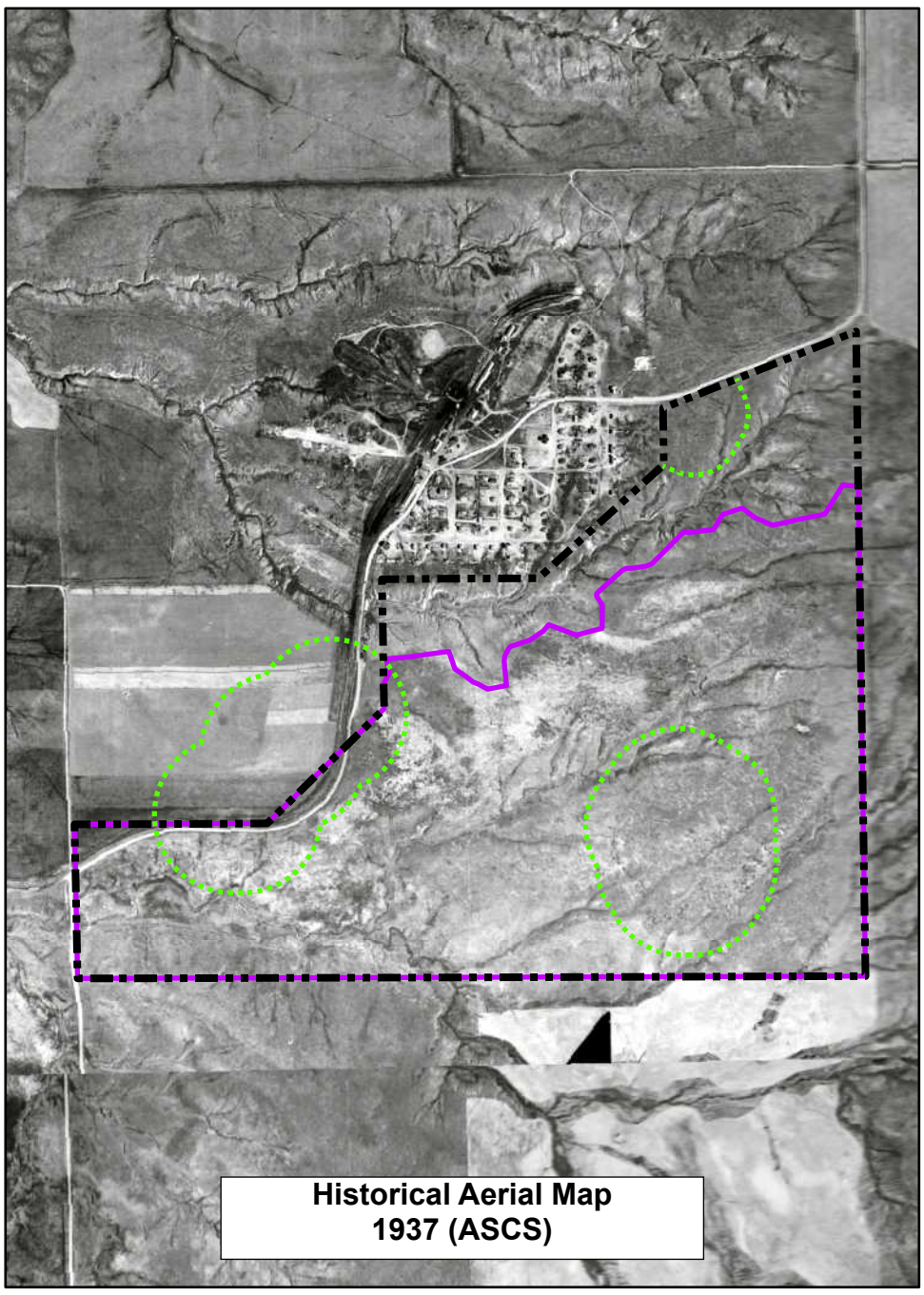

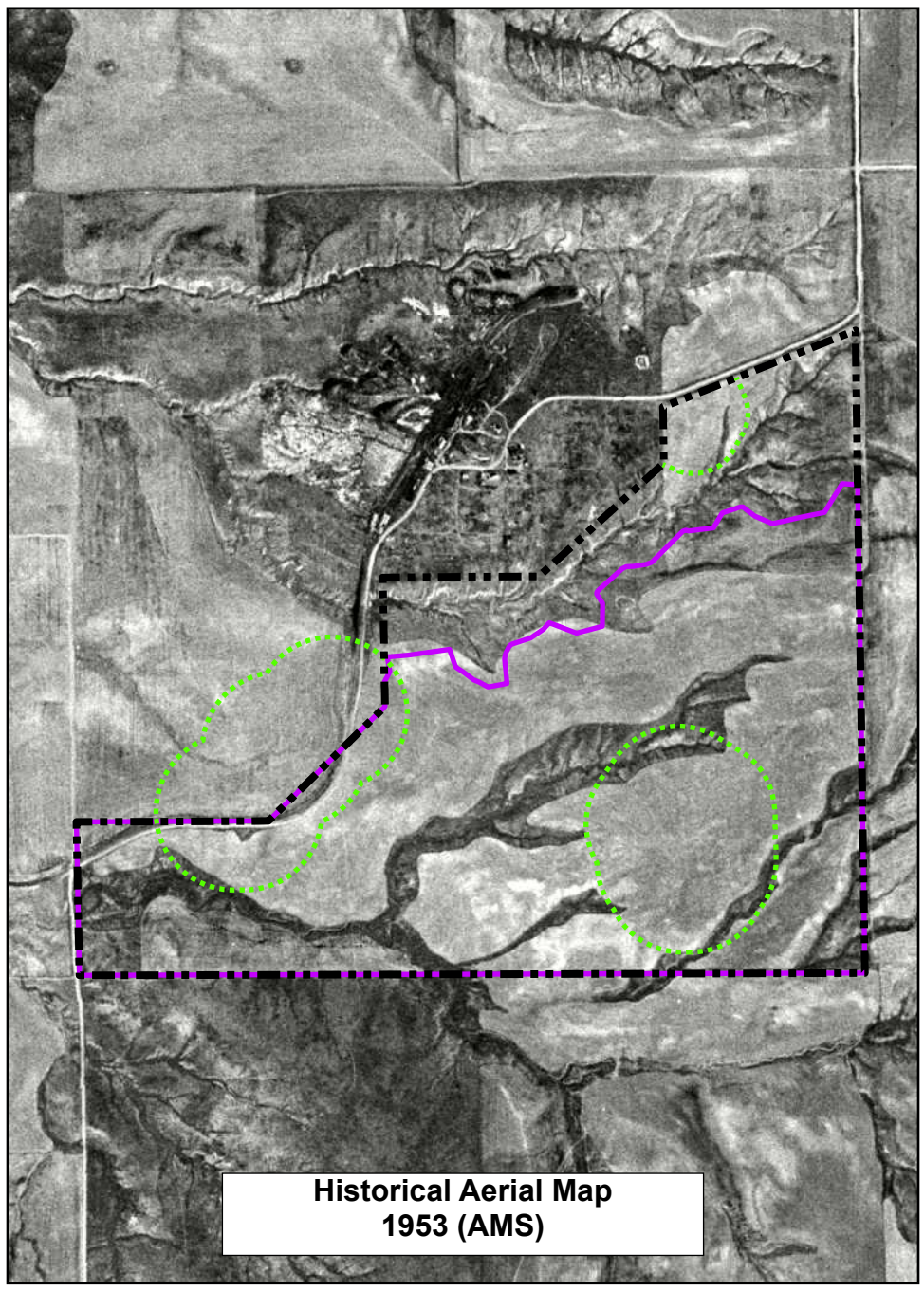

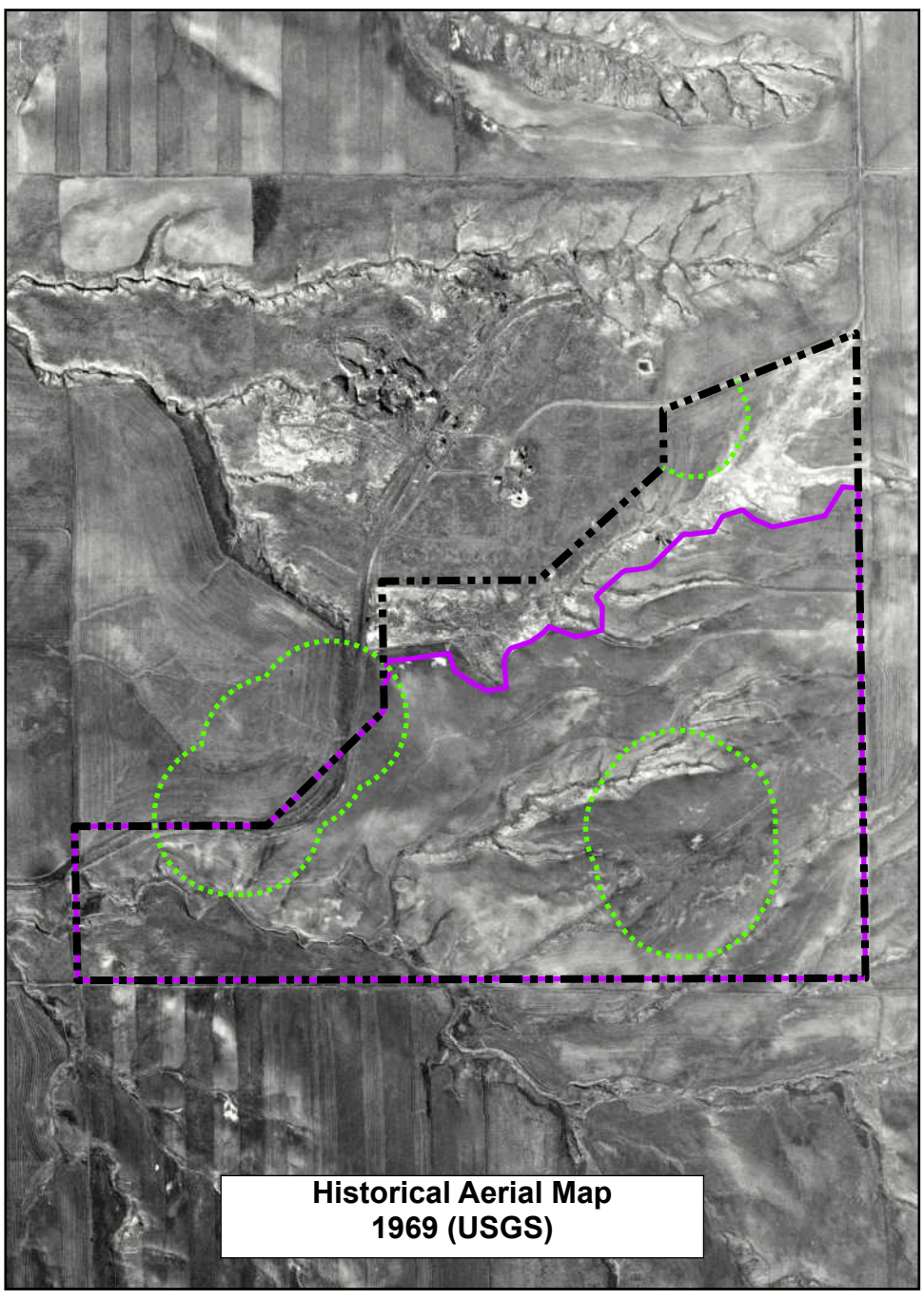

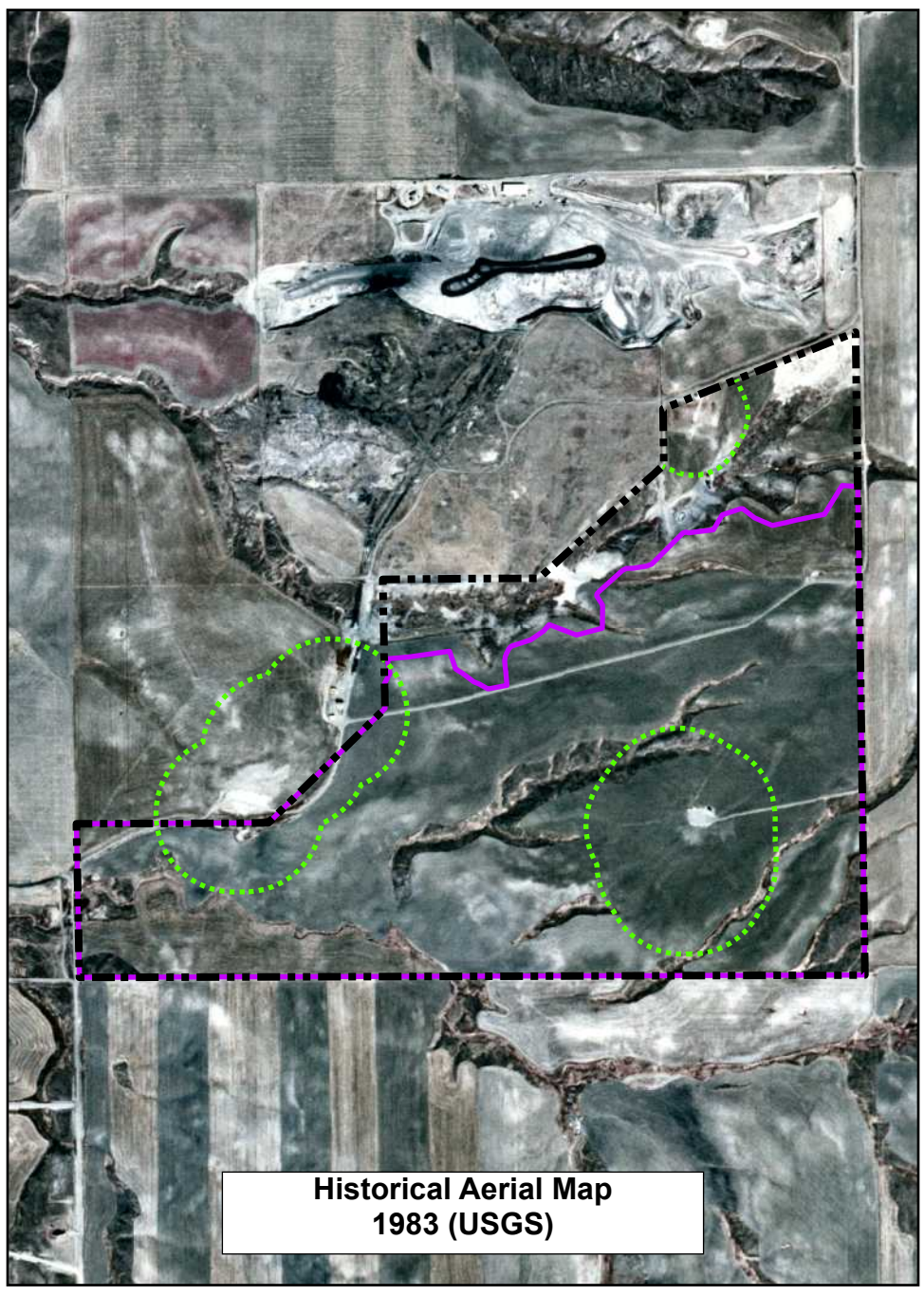

Legend

500 ft Oil & Gas Setback

Planned Development Area

Property Boundary

Notes:
1. Aerial Image sources are indicated in parenthesis after year. They are considered approximate.
2. Property features are proposed and considered approximate.
USGS = United States Geological Survey
AMS = Army Map Service
ASCS = Agricultural Stabilization and Conservation Service

N

0 1,200 Feet

Scale applies to all frames

Historical Aerial Photos 1937-1983

Redtail Ranch Property, Erie, Weld County, CO

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Figure 3a

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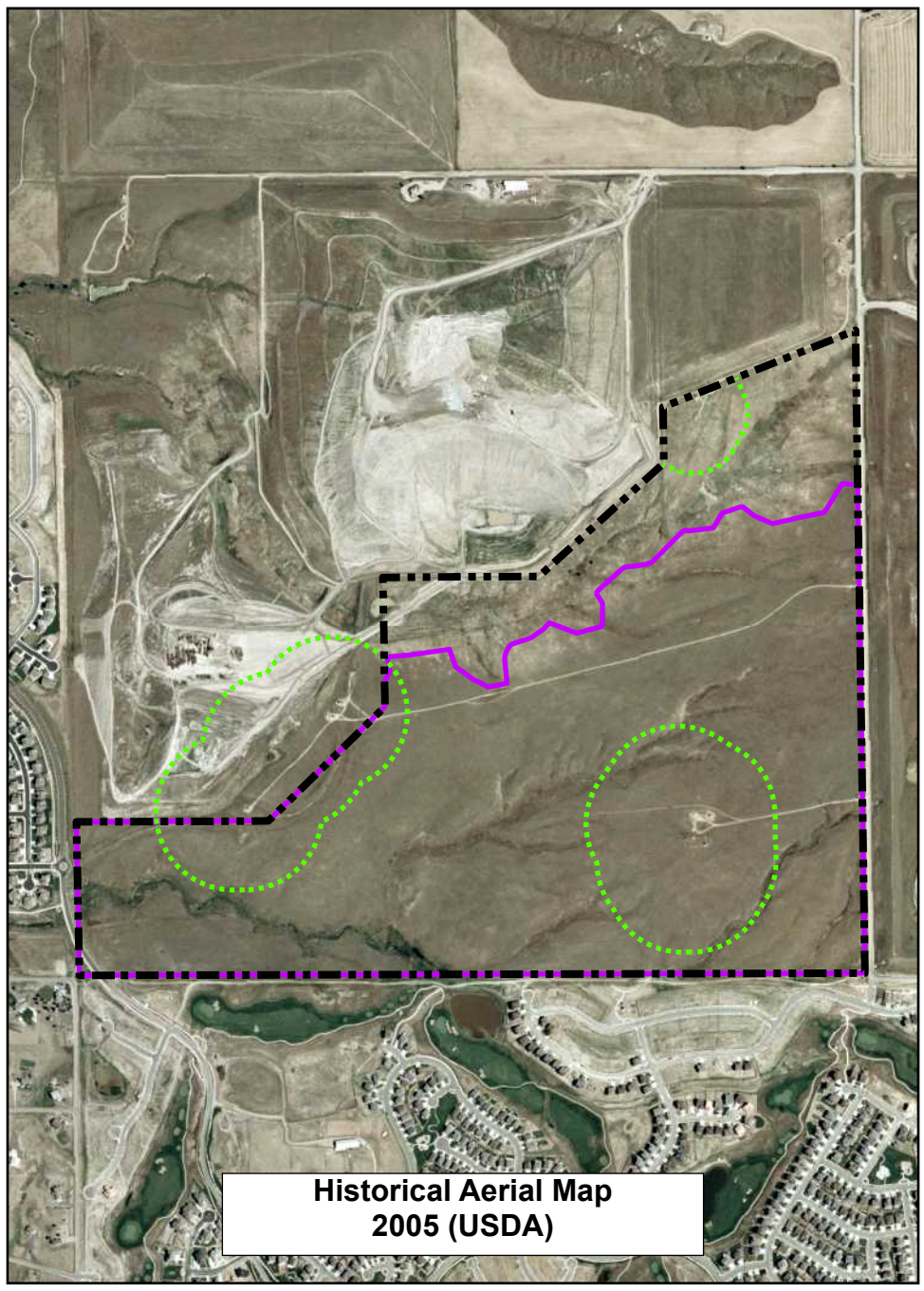

Legend

500 ft Oil & Gas Setback

Planned Development Area

Property Boundary

Notes:
1. Aerial Image sources are indicated in parenthesis after year. They are considered approximate.
2. Property features are proposed and considered approximate.
USGS = United States Geological Survey
USDA = United States Department of Agriculture

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Scale applies to all frames

Historical Aerial Photos 1999-2017

Redtail Ranch Property, Erie, Weld County, CO

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DE1075	May 2025	Figure 3b

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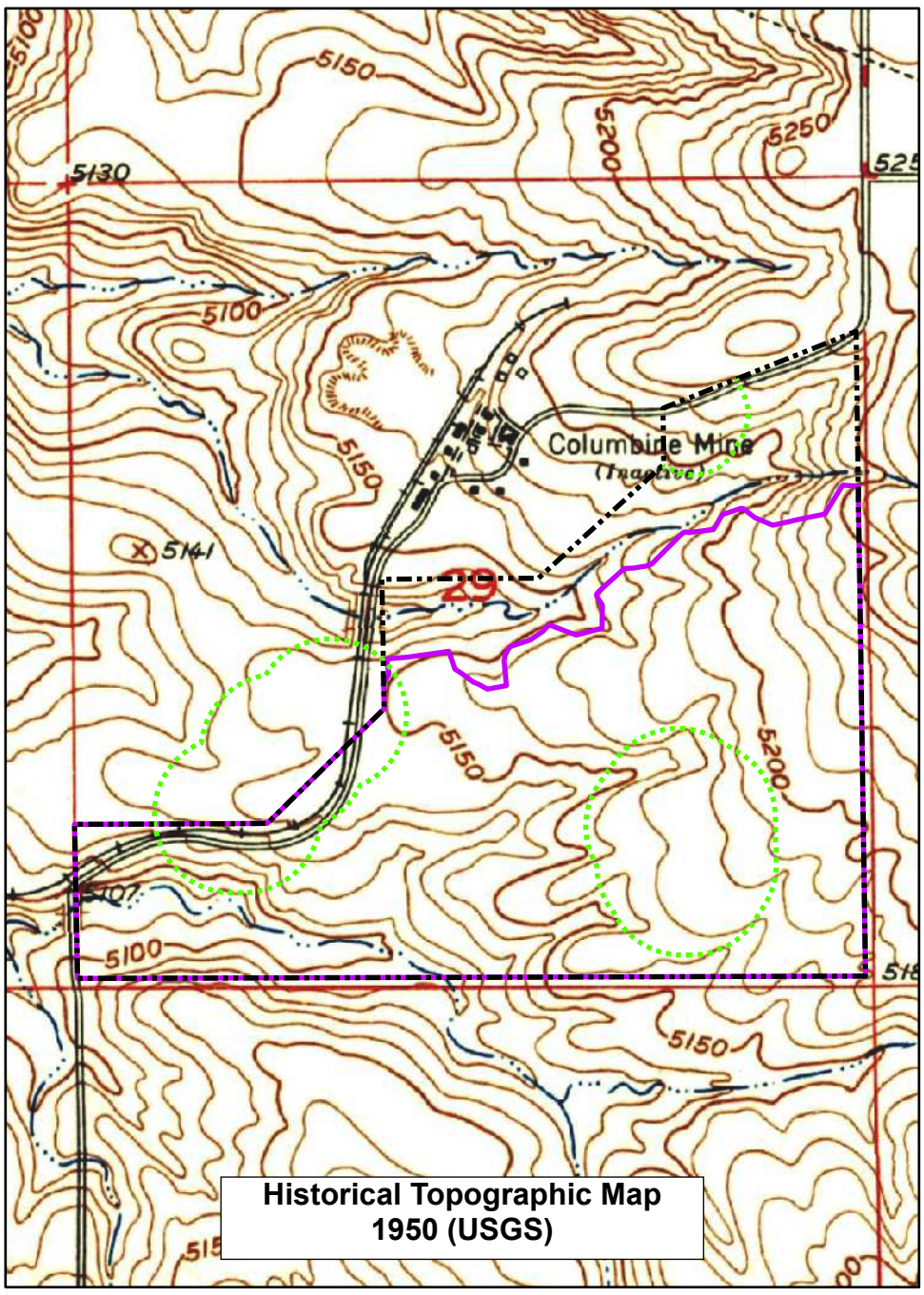

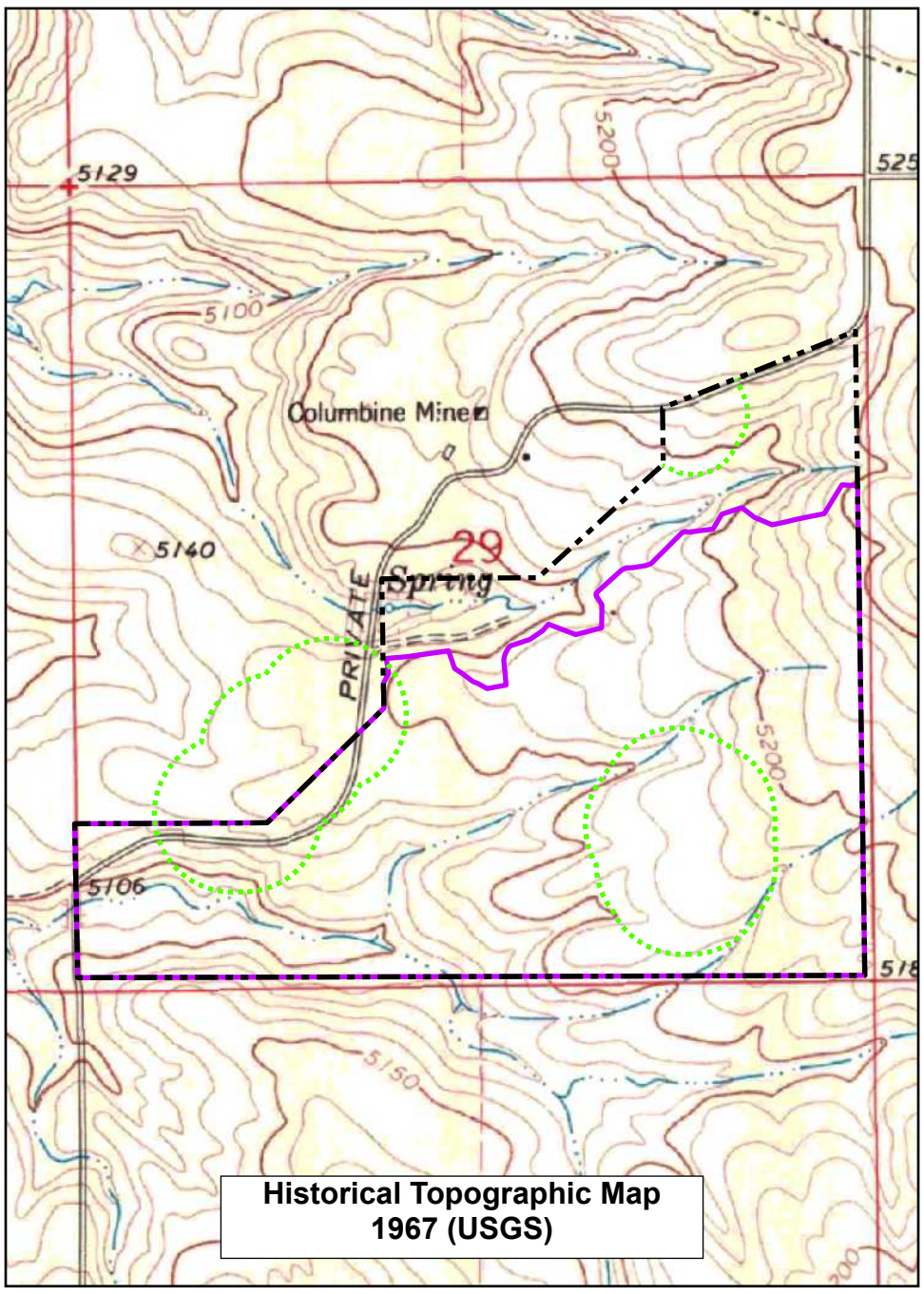

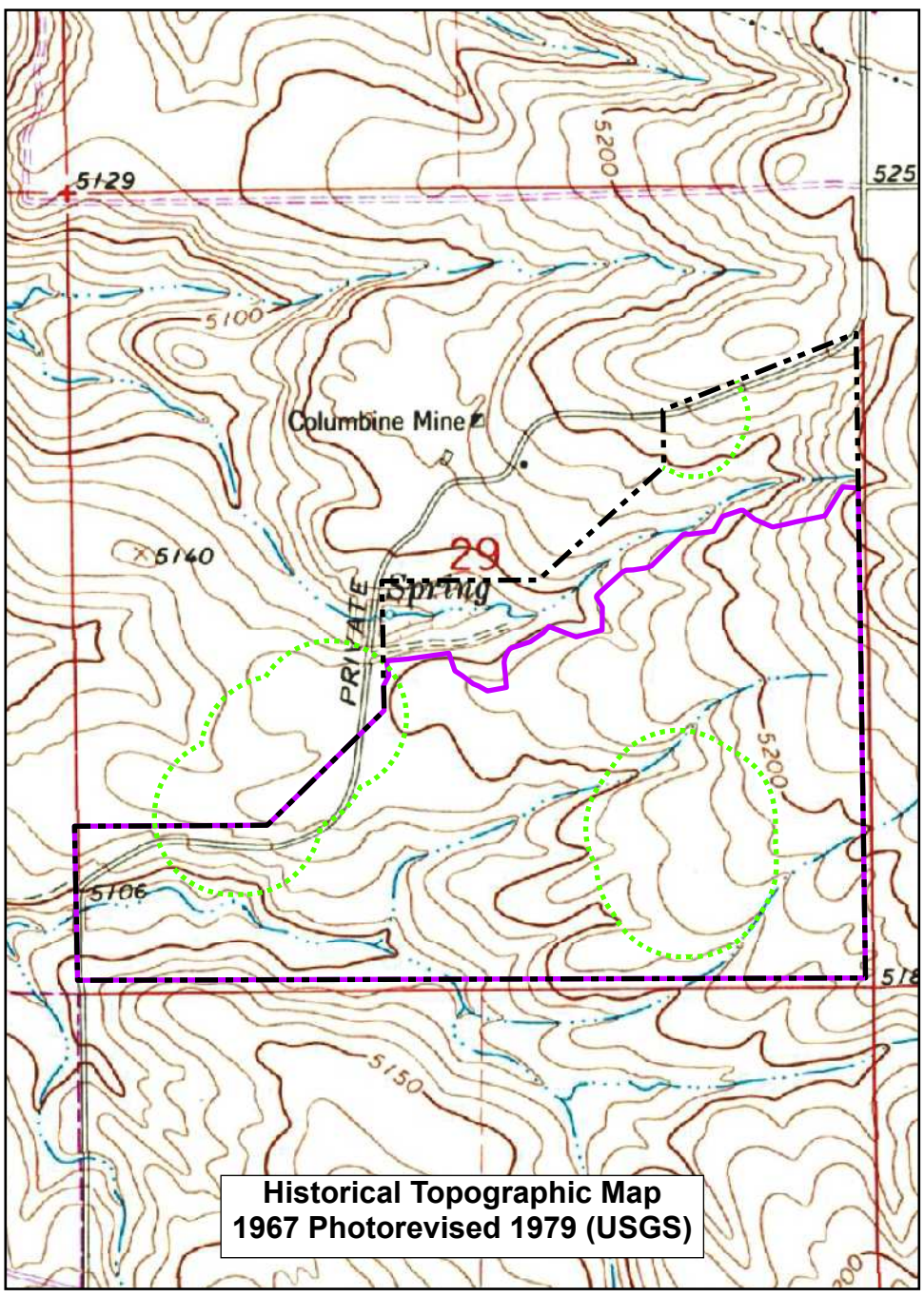

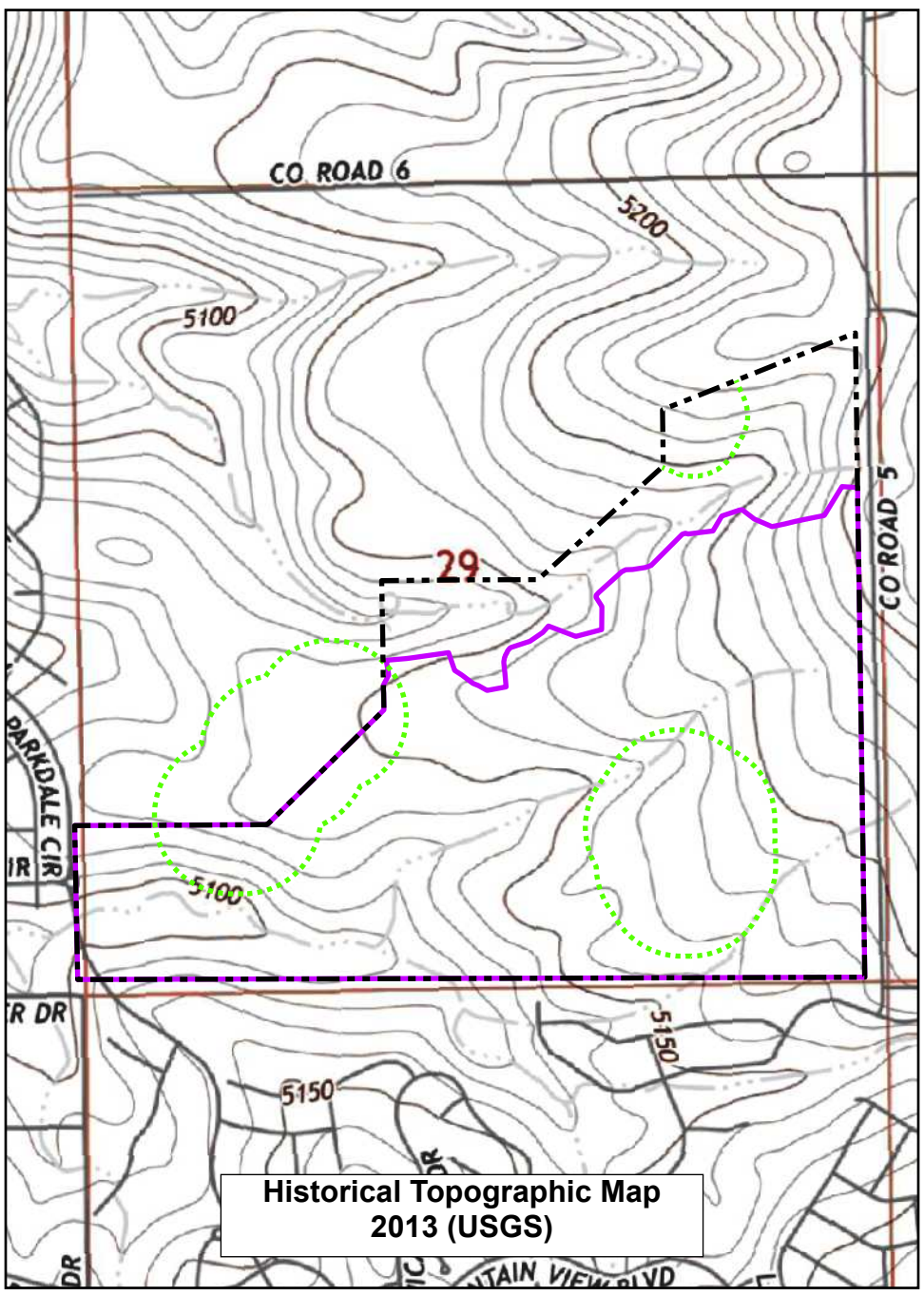

Legend

- 500 ft Oil & Gas Setback
- Planned Development Area
- Property Boundary

Notes:
1. Erie, CO topographic quadrangles are provided by the United States Geographic Survey (USGS).
2. The 1979 photorevision is assumed to contain the same topographic lines as the 1967 topographic map.
3. Property features are proposed and considered approximate.

N

0 1,200 Feet

Scale applies to all frames

Historical Topographic Maps 1950-2013

Redtail Ranch Property, Erie, Weld County, CO

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Figure 4

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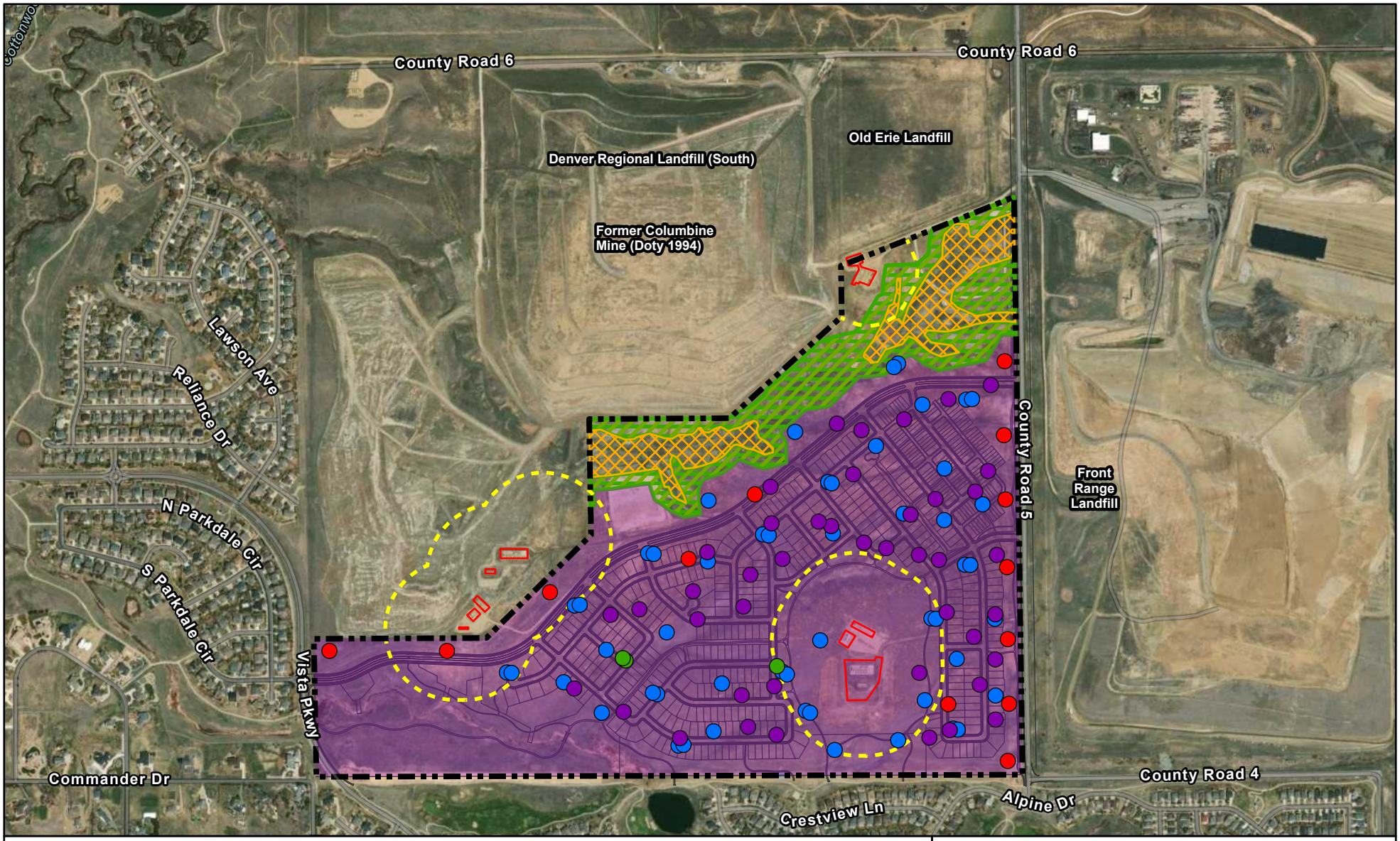

Legend

- Soil Boring Location
- Composite Soil Sampling Location
- Groundwater Sampling Location
- Soil Vapor Sampling Location
- Active Oil & Gas Location Boundary
- 500 ft Oil & Gas Setback
- Environmental Area (17.30 Acres)
- Planned Development Area
- Environmental Area Setback (28.47 Acres)
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Notes:
1. Site features are proposed and considered approximate.
2. 2023 World Imagery: Maxar.

N

0 1,000 Feet

Previous Investigation Locations Map

Redtail Ranch Property, Erie, Weld County, CO

Geosyntec consultants

DE1075	May 2025

Figure 5

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ATTACHMENT A

RESUME OF DAVID J. FOLKES, P.E. (CO)

Geosyntec
consultants

DAVID J. FOLKES, P.E.
Senior Principal

soil investigation & cleanup
groundwater assessment and remediation
vapor intrusion evaluation and mitigation
waste disposal facility design and remediation
ESA, costing and regulatory support
litigation support

EDUCATION

M.A.Sc., Civil Engineering, University of Toronto, Canada, 1980
B.A.Sc., Geological Engineering (honors), University of Toronto, Canada, 1977

PROFESSIONAL REGISTRATIONS

Colorado Professional Engineer No. 23229

CAREER SUMMARY

Mr. Folkes has over 40 years of experience addressing contamination of environmental media at a wide variety of sites across North America and overseas, including investigation and cleanup of multi-media impacts at oil and gas, mining, metals processing, industrial, agricultural, waste disposal, and other facilities; and assessment and mitigation of indoor air impacts due to vapor intrusion. He has provided litigation support related to soil and groundwater contamination and vapor intrusion impacts, including expert testimony in state and federal court.

Mr. Folkes has addressed soil and groundwater contamination at numerous sites across the country under RCRA, CERCLA, UST, Brownfields, Voluntary Cleanup and other regulatory programs, including sites impacted by petroleum, chlorinated solvents, metals, brine, nutrients, pesticides, PCBs, nitrate, and other compounds. Groundwater remedies evaluated and/or implemented include hydraulic containment, in-situ bioremediation, in-situ chemical oxidation, soil vapor extraction, multi-phase extraction, air sparging, slurry walls, permeable reactive barriers, and other technologies.

Mr. Folkes has worked on a variety of oil and gas sites, including operating and former oil refineries and gas plants, distribution and blending facilities, exploration and production fields, pipelines, and retail sites. Over the past 24 years he has helped the Wyoming DEQ oversee the investigation and cleanup of several major oil refinery sites, including removal of piping and infrastructure, soil remediation, LNAPL recovery, groundwater remediation, and boundary containment systems to protect adjacent rivers.

Mr. Folkes has helped metals processing and mining companies address metals issues in

all media including management of remedial investigations, feasibility studies, and remedial action at the Asarco Globe Plant in Denver Colorado, which included cleanup of surface soil at over 1000 residential and commercial properties. He has evaluated the sources, nature and extent, leaching potential, and cleanup options for soils impacted by arsenic, lead, and other metals at former smelter and metals processing facilities across the US.

Mr. Folkes is also an expert in the evaluation and mitigation of vapor intrusion (VI). He has worked on over 240 VI projects across North America and overseas over the past 27 years, including sites in Europe, South America, Australia, and Southeast Asia. Mr. Folkes has been extensively involved with development of VI practice and guidance. Mr. Folkes helped develop the ITRC 2007 VI Guidance, 2014 Petroleum VI Guidance, and VI Mitigation Training Fact Sheets and is currently a member of the recently formed VI Pathway Evaluation and Mitigation team.

Representative projects are presented below related to investigation and cleanup of soils; investigation and remediation of groundwater; waste disposal facility design, investigation, and remediation; environmental site assessment, costing, and regulatory support; assessment and mitigation of vapor intrusion; and litigation support.

Soil Investigation and Cleanup Projects

Technical Support, Oil Refinery & Gas Plant Cleanup, *Wyoming*. Mr. Folkes has assisted the Wyoming Department of Environmental Quality (WDEQ) with oversight of investigations and cleanup of soil, groundwater, surface water, sediments, and other media at several former and operating refineries and gas plants across Wyoming since 2000. Work typically includes review of investigation work plans and reports, remedy design documents, remedy implementation work plans, monitoring reports, and remedy completion reports; participation in collaborative work groups on various technical issues, and presentations to the public. Soil cleanups at various sites have been to residential, commercial, and/or open space use standards as well as protection of groundwater (leaching potential) for volatile petroleum compounds, polycyclic aromatic hydrocarbons, metals, asbestos, and other compounds.

Evaluation of Metals in Mining Town Soils, *Rico, CO.* Mr. Folkes assisted the Town of Rico with evaluation of soil investigations, risk assessments, and soil cleanup plans by Atlantic Richfield (AR) for residential yards, streets, and open space impacted by historic lead mining and smelting activities. Soil cleanup of developed properties will occur beginning in 2025 pursuant to a voluntary cleanup plan approved by the Colorado Department of Public Health and Environment (CDPHE). Work has included statistical evaluation of data, estimation of cleanup costs, development of sampling work plans,

collaborative work group meetings with the town and AR, and presentations on the status of the work to the town residents and Board.

RI/FS/RA at Asarco Globe Plant, *Denver, Colorado*. Mr. Folkes was Project Manager for Remedial Investigations, Feasibility Studies, development of a Statement of Work, and implementation of Remedial Design/Remedial Action for the Asarco Globe Plant, an historic lead smelter, arsenic trioxide refinery, cadmium refinery, and ongoing specialty metals processing plant. Principal metals of concern were lead, arsenic, cadmium, and zinc. Media investigated included groundwater; surface water and sediment of drainage ditches, ponds, and the South Platte River; on and off-site soils impacted by stack and fugitive emissions; and air. Sources evaluated included a tailings pond, wet operations and sumps, and historic processing facilities (now buried). Operable Units include cleanup of surface soils at over 1000 residential and commercial properties in the surrounding community; interception and treatment of groundwater; removal and disposal of contaminated ditch sediments; construction of a slurry wall and RCRA cap to contain a 7 acres pile of calcium sulfate precipitates; stabilization of contaminated sediments; and air emission controls. Some of the community soil cleanup work was conducted for the State of Colorado after the bankruptcy of Asarco in 2005.

Evaluation of Cadmium and Arsenic Leaching in Soil, *Denver, Colorado.* Mr. Folkes evaluated the potential for vertical migration of cadmium, arsenic, and lead due to leaching of smelter impacted soils. The work included testing to determine partitioning coefficients and other factors controlling migration and modeling of vertical transport. Results showed that concentrations substantially higher than typical soil screening levels could be left in place without risk to groundwater, and that inexpensive methods such as vegetation, sloping, and pH modification could treat soils with high concentrations of metals.

Metals Leaching Study at Mine and Mill Site, *Blackhawk, New Mexico*. Mr. Folkes was the principal investigator for the evaluation of potential leaching and migration of metals in soils at a mine and mill site. The work included modeling of leaching based on partitioning of metals between soil and water phases.

Evaluation of the Source of Arsenic in Community Soil, *Denver, Colorado.* Mr. Folkes was the Project Manager and principal investigator for the evaluation of the source of high arsenic and lead concentrations in community soil around a former arsenic trioxide refinery. Work conducted under his direction including geo-statistical modeling and analyses, scanning electron microscope analyses, and review of historic aerial photographs and building construction records. The work showed that stack and fugitive emissions from the historic arsenic refinery site were not responsible for the most of the

high arsenic concentrations observed in off-site soils, particularly in distal communities. The source of high arsenic soil concentrations was application of arsenic and lead bearing herbicides and insecticides during the 1950's and 1960's. EPA and CDPHE ultimately agreed with these findings, issuing a ROD that identified pesticides as the source of the arsenic.

Evaluation of the Source of Lead in Community Soil, *Omaha, Nebraska.* Mr. Folkes was the Project Manager for the evaluation of the sources of lead contamination of soil currently attributed to historic lead refinery emissions by Asarco. The work included spatial evaluations of lead concentrations compared to wind directions and house age, metals ratios and isotopes, and detailed soil sampling around a home with lead-based paint to evaluate typical inter-yard spatial patterns due to fugitive paint chips. The study indicated that lead paint is the primary cause of elevated lead levels in the Omaha area.

RI/FS at Former Omaha Grant Lead Smelter, *Denver, Colorado*. Mr. Folkes was Project Manager for a remedial investigation and feasibility study conducted at this former lead smelter site. Principal metals of concern include lead and arsenic. Environmental media evaluated included groundwater, surface water and sediment of the South Platte River, and soils.

Evaluation of Impact of Historic Air Emissions on Community Soil, *Denver, Colorado*. Mr. Folkes was Project Manager for the evaluation of surface soil impacts due to historic point source and fugitive air emissions of lead and arsenic. Work under his direction included researching historic emission rates and metals contents of feedstocks and by-products, air dispersion and deposition modeling of emissions over the history of the facility, simulation of vertical transport of lead and arsenic in soils, and comparison to measured concentrations in soils. The work demonstrated that airborne impacts were limited to defined areas and that other impacts were due to background anthropogenic sources.

Evaluation of Smelter Impacts to Community Soils, *Various Smelter Sites, US.* Mr. Folkes was Project Director for the evaluation of impacts to community soils surrounding various smelters in the U.S. for the responsible party, including evaluation of natural and anthropogenic background levels of arsenic, lead, and other metals, and evaluation of the probable extent of impact due to historic point source and fugitive air emissions. The evaluations are based on various lines of evidence, including review of historic operations, statistical evaluation of metals ratios, geostatistical evaluation of spatial patterns, and the results of air dispersion modeling.

Evaluation of Historic Gold and Lead Mine Impacts, *Breckenridge, Colorado.* Mr. Folkes evaluated the potential impacts of historic mining adits, shafts, waste rock, and

tailings on surface and groundwater quality, and prepared waste rock and tailings management plan to control exposure to soils with elevated lead concentrations and allow residential and commercial site development.

Smuggler Mountain NPL Site, *Aspen, Colorado*. Mr. Folkes prepared engineering cost estimates for the selected soil remedy for the PRP committee for the Smuggler Mountain NPL site. The work included evaluation of alternative sites for waste disposal.

Groundwater Investigation and Remediation Projects

Chlorinated Solvent, 1,4-Dioxane, and PFAS Remediation, *Broomfield, CO.* Mr. Folkes is the Project Manager for remediation of a former electronics manufacturing facility with chlorinated solvent, 1,4-dioxane, and PFAS in groundwater. The scope of work includes maintenance of an existing pump and treat boundary control system and development of alternate, passive and in-situ remedies that will ultimately allow closure of the Site under Colorado's Low-Threat Conditional Closure policy.

Petroleum LNAPL Source Zone Remediation*, Miami, OK.* Mr. Folkes is the Project Director for investigations and remediation of a petroleum NAPL source zone at a former industrial facility in Miami, OK. The work has included additional investigations, including LIF probes, monitoring wells, and aquifer tests to refine the conceptual site model; development of a remedial action plan to guide the remedy development process; pilot scale testing of selected technologies, including enhanced extraction of LNAPL, air sparging, and ISCO; and installation and operation and maintenance of the selected enhanced vacuum extraction and air sparging system.

Chlorinated Solvent Source Remediation, *Oklahoma City, OK.* Mr. Folkes is the Project Director for remediation of a chlorinated solvent plume source at an industrial site in Oklahoma City. The work included additional investigations to improve the conceptual site model, bench scale testing of ISCO alternatives, pilot scale testing of ISCO injections, and full-scale implementation of an ISCO remedy. Off-site plume risks and management options are currently being evaluated.

Technical Support, Oil Refinery & Gas Plant Cleanup, *Wyoming*. Mr. Folkes has assisted the Wyoming Department of Environmental Quality (WDEQ) with oversight of investigations and cleanup of groundwater, LNAPL, sediments, and other media at several former and operating refineries and gas plants across Wyoming since 2000. Work typically includes review of investigation work plans and reports, remedy design documents, remedy implementation work plans, monitoring reports, and remedy completion reports; participation in collaborative work groups on various technical issues, and presentations to the public. Issues include NAPL recovery; groundwater containment; groundwater flushing and pump and treat remedies; air sparging, in situ biodegradation, MNA, NSZD, and phytoremediation of groundwater; vapor intrusion

evaluation and mitigation; sediment and soil cleanup.

PCE Plume Remediation, *Casper, WY.* Mr. Folkes is the Project Director for the investigation and remediation of soil and groundwater associated with historic releases of PCE from a dry cleaner in Casper, WY, which resulted in a dissolved phase plume extending over one mile to the North Platte River. The work is being done for the Wyoming DEQ under the Orphan Sites program. An MiHPT probe was used to evaluate the nature and 3D extent of DNAPL source material in the aquifer and allow targeted injections of emulsified vegetable oil to stimulate anaerobic biodegradation in the source zone. In addition, an SVE system was installed and operated to remediate residual solvents in the vadose zone. The SVE system was recently decommissioned after achieving asymptotic soil vapor levels, and additional investigations including High Volume Sampling (HVS) of soil vapors to evaluate the nature and extent of residual source mass. The downgradient dissolved phase plume is being managed through MNA and institutional controls, with contingencies for more aggressive action if remediation milestones are not met.

Chlorinated Solvent Plume Remediation, *Denver, CO.* Mr. Folkes was the Project Manager, and subsequently the Project Director for the investigation and remediation of a two mile long chlorinated solvent plume, including evaluation of on-site and off-site remedial alternatives; design and installation of a groundwater hydraulic containment system, including cVOC and 1,4-dioxane treatment; characterization of three separate DNAPL source zones in weathered bedrock and alluvium; ISCO pilot testing; design and installation of in-situ anaerobic and aerobic bioremediation systems; forensic evaluation of the contributions of other sources, and expert and consulting witness roles in class action and insurance cost recovery lawsuits. He now serves as a technical advisor for the current Project Director and Project Manager.

Evaluation of ISCO Performance, *Syracuse, NY.* Mr. Folkes was the Project Manager for the evaluation of the performance of an In-Situ Chemical Oxidation (ISCO) remedy using potassium permanganate at an industrial facility. Issues addressed included the overall efficacy of the remedy in a weathered bedrock environment, including injection locations and other issues.

Evaluation of In-Situ Bioremediation Performance, *Syracuse, NY.* Mr. Folkes was the Project Manager for the evaluation of the performance of an in-situ bioremediation remedy using potassium permanganate at an industrial facility. Issues addressed included the overall efficacy of the remedy, as well as injection procedures, the substrate and inoculant used, injection locations and pressures, and other issues.

Evaluation of Industrial Facility, *Denver, CO.* Mr. Folkes was the Project Director for groundwater, soil vapor, sub-slab vapor, and indoor air investigations. Recent

investigations by another consultant indicated that previously undetected PCE contamination was present in groundwater, potentially jeopardizing an existing No Further Action determination. Our investigations showed impacts were from off-site sources or aged on-site sources requiring no active remediation, and that PCE concentrations detected by others were due to poor well construction. Based on this, CDPHE approved No Further Action.

Evaluation of Environmental Costs, *Multiple States.* Mr. Folkes was Project Manager and a consulting expert for the Asarco Incorporated bankruptcy creditors committee. The work included evaluation of reasonable costs for addressing remaining environmental issues at various mine, mill, and smelter sites in Colorado, New Mexico, Arizona, Missouri, and other states. Issues included soil and groundwater contamination at mine sites, tailings pile closure and soil contamination at former smelters and metals processing sites.

Former Chemical Manufacturing Facility, *East Rutherford, NJ.* Mr. Folkes was the Project Director for evaluation and remediation of a chlorinated solvent source zone in peat and estuarine sediments, including O&M of an ozone sparging system installed by others and evaluation of more cost-effective alternatives. Challenges included an immediately adjacent tank farm and building, a shallow water table and seasonal flooding, and truck traffic over the source area.

Former Dry Cleaner, *Arvada, CO.* Mr. Folkes was the Project Director for investigation and remediation of groundwater impacted by PCE releases. Our conceptual model indicated a vadose zone source that was impacting groundwater through soil gas partitioning, allowing an SVE-only remedy. Concentrations are now below MCLs at the property line and only 20 ppb near the source zone; as a result, an NFA petition was granted by the regulatory agency.

Former Lead Smelter, Arsenic Refinery, & Cadmium Plant, *Denver, CO*. Mr. Folkes was the Project Manager of remedial investigations, feasibility studies, and remedy design and implementation at a former smelter and metals refinery that operated from 1886 into the early 2000s. Responsibilities included direction of multi-media remedial investigations; multi-media feasibility studies and alternative evaluations; and selected remedy designs for groundwater, soil, surface water, sediment, and air emission issues. Supervised preparation of construction plans and specifications for groundwater interception drain, and implemented several interim remedial actions including pipe repairs, groundwater interception, and temporary capping of tailings material. Project completed in 2005 with the bankruptcy of ASARCO Inc., with some follow-on work through the bankruptcy committee and the State of Colorado.

Fumigant Impacts to Groundwater, *Salina, KS.* Mr. Folkes was the Project Manager for

the evaluation of chlorinated solvent contamination of groundwater, including identification of sources, fate and transport issues, and evaluation of potential off-site impacts. In the latter stages of the project, before closure, he reviewed periodic reports by others for one of the responsible parties, monitoring the progress of monitored natural attenuation.

***Closed Grain Silo**, Johnstown, CO*. Mr. Folkes was the Project Manager for investigations of soil and groundwater impacts including evaluation of barium impacts to road base materials, pesticides in soil and within the building, and asbestos and lead paint. Work included development and evaluation of remedial alternatives to address TCLP levels of barium in soil.

***Rocky Mountain Arsenal,** Colorado.* Mr. Folkes served as a consulting expert to the Colorado Department of Public Health and Environment (CDPHE) and the Colorado Attorney General's Office, assisting with technical evaluation of contamination and remediation of solvents, metals, and other compounds at the RMA. Services were provided under subcontract to the prime consultant to the state.

Vapor Intrusion Assessment and Mitigation

***Large Residential Vapor Intrusion Site**, Denver, CO.* Mr. Folkes was the Project Manager/Director (1997-2023) for the investigation and remediation of chlorinated solvent vapors in houses and other buildings resulting from a large, chlorinated solvent groundwater plume. He is now a senior technical advisor to the project team and client. The scope of work has included groundwater contaminant plume delineation, soil and soil vapor testing, indoor air testing of over 700 buildings, design and installation of sub-slab depressurization systems in over 350 homes and apartments, monitoring of ventilation system performance, modeling of vapor migration into construction trenches, design and installation of a ventilation system for a manufacturing building, design and installation of a groundwater containment system, DNAPL source characterization, ISCO injections below the site building in weathered bedrock, and design and installation of an enhanced in-situ bioremediation system.

***VIMS Design for Several New Large Warehouse Buildings,** Kansas City, Missouri*. Mr. Folkes is the Project Director for the design and oversight of installation of VI mitigation systems (VIMS) for several new, large warehouse buildings being constructed at a former federal complex in Missouri. The scope of work included the development of a general VI mitigation approach to meet the requirements of various stakeholders (federal agencies, state regulators, and the developer), which was approved by MDNR. Pre-design investigations are being conducted within the footprint of each building, followed by preparation of VIMS design drawings and specifications for each building, and quality assurance services during construction, startup testing, and inspections and testing of

newly installed mitigation systems. The VIMS for one building is installed and operating; the VIMS has been installed and undergoing startup testing in a second building; and the VIMS designs for three other buildings are in progress as of the spring of 2023.

Mitigation of Multi-Family Residential Buildings, Brownfield Site, *San Juan, Puerto Rico.* Mr. Folkes was the Project Director for the design of aerated floor mitigation systems for seven new multi-family residential buildings at this site, as well as review of designs by others of traditional gravel and liner mitigation systems for nine other new multi-family residential buildings at the same site, as well as review of traditional system designs for 13 new multi-family buildings at a second Brownfield site in San Juan. The scope of work also included inspection of both the aerated floor and gravel/liner systems during construction, and vacuum/leak testing of the completed systems.

Conceptual Methane Mitigation Designs, *Florida.* Mr. Folkes assisted Geosyntec's local engineers with conceptual methane mitigation system designs for a proposed new hospital, to be constructed at an old industrial landfill site. The conceptual designs included excavation of wastes below the building footprint, including a buffer zone, and an aerated floor system to vent any methane and other landfill gases that might migrate laterally from the waste to the building foundations. The work also included review of a traditional membrane, gravel and gas-collection pipe design, and evaluation of mitigation alternatives for areas outside of the building.

Various Oil Refineries, *Wyoming*. Mr. Folkes is providing technical support to the Wyoming DEQ for the investigation and remediation of the various former and operating oil refineries and gas plants across Wyoming, including vapor intrusion concerns due to LNAPL and groundwater plumes. This component of the work has included evaluation of vapor intrusion screening levels and mitigation designs for new commercial buildings on site.

Wyoming DEQ Voluntary Remediation Program*, Wyoming*. Mr. Folkes assisted the Wyoming DEQ with development of vapor intrusion guidance (published in 2019) for its Voluntary Remediation Program, including screening, evaluation, and mitigation procedures for general and petroleum vapor intrusion sites. Mr. Folkes also led a two-day training program on vapor intrusion for WDEQ personnel.

Aerated Floor Mitigation System Design & Construction Inspection/Testing, *various U.S. states.* Mr. Folkes has directed and/or assisted with the design, inspection, and testing of aerated floor mitigation systems at a variety of sites across the U.S., including seven multi-family buildings in Puerto Rico; three car dealerships in Georgia; two hotels in Arizona; a residential/commercial building in New York; commercial/restaurant buildings in Oakland, Denver, and Chicago; a YMCA in Pennsylvania; a nurse's college building in Texas; a bank in Colorado; an office building in New Jersey; a school in

Toronto; a child development center in Nevada; a commercial/industrial building in Colorado; and a commercial building in Massachusetts. Compounds addressed by the mitigation systems have included chlorinated solvents, petroleum compounds, methane, and radon.

Conceptual Mitigation Designs for Multi-family buildings, *Stockholm, Sweden.* Mr. Folkes was technical lead for development of conceptual VI mitigation designs for proposed multi-story residential apartment buildings in Stockholm, Sweden. Chlorinated solvents were present in fractured rock and groundwater below the site, requiring preemptive mitigation VI systems. The buildings included residential units on grade, a below grade kindergarten, and up to four levels of underground parking garages. The conceptual designs considered the potential mitigating effects of the garages and included passive barrier/venting systems and aerated floor alternatives.

Manufacturing Building Vapor Intrusion Site, *Mississippi.* Mr. Folkes is providing confidential consulting expert services to outside legal counsel for the owner of a manufacturing building with potential vapor intrusion concerns related to historic releases of chlorinated solvents by the prior building owner. Under an indemnity agreement, the prior owner is evaluating vapor intrusion in onsite and offsite buildings. Mr. Folkes is reviewing work plans and reports prepared by consultants for the prior owner on behalf of the current owner and providing mitigation and monitoring recommendations, including the installation of a floor sealant by Geosyntec. Mr. Folkes is also reviewing groundwater investigation reports and cleanup plans, including the results of MiHPT investigations that Mr. Folkes recommended be conducted to identify the source of DNAPL impacts and allow targeting of remedial action.

Vapor Intrusion Evaluation of Large Industrial Site, *Ohio.* Mr. Folkes was the Project Director for evaluations of vapor intrusion potential for several buildings at a large industrial site, including development of a conceptual site model, evaluation of multiple lines of evidence for each building, and identification of data gaps. Preliminary findings indicated a low potential for vapor intrusion and that most exceedances of screening levels were likely due to background sources.

Petroleum Vapor Intrusion Evaluation at Pipeline Release Site, *Colorado.* Mr. Folkes was the project manager for evaluations of potential impacts of a petroleum pipeline release on indoor air in two adjacent homes. Indoor air and outdoor air samples were collected and analyzed for BTEX compounds following state-of-the-art TO-15 test methods. A forensic evaluation of the data, included compound ratio analysis, indicated that fuel-containing equipment stored in attached garages were responsible for elevated benzene levels and that the released product had no discernable impact on indoor air quality.

***Mitigation of Storage Facility**, Keswick, Australia.* Mr. Folkes led a technical team responsible for designing and overseeing the installation of a sub-slab depressurization system in a new multi-story storage facility in Keswick, Australia. Innovative designs were required to deal with a close-spaced grid of grade beams, low permeability subgrade materials that had already been placed to grade when Geosyntec was retained, and high TCE concentrations in soil gas. The mitigation system employs a thin, permeable geogrid vent mat immediately below the slab and vapor barrier (to avoid difficult excavation of already placed soils between grade beams), and perforated pipe laterals in gravel trenches that convey vacuum to the multiple isolated cells created in the subgrade by the grade beams. The laterals connect to header pipes on opposite sides of the building, with a separate riser and blower serving each header pipe for redundancy. The system has been installed with periodic inspections by the local engineer under Geosyntec oversight.

***Evaluation of TCE Impacts at USACOE Laboratory**, Hanover, NH.* Mr. Folkes was an invited vapor intrusion subject matter expert for third party review of vapor intrusion investigations and mitigation at a large government laboratory in New Hampshire. Significant historic TCE releases had resulted in high TCE levels in soil gas in several areas around the building and elevated TCE levels throughout the building. Mitigation to date had included retrofitting of a spray-on liner sub-slab depressurization (SSD) system in one wing, and suction points for additional SSD in other parts of the building, but elevated indoor air levels persisted. Mr. Folkes developed a conceptual model of the vapor intrusion source and transport mechanisms and provided additional recommendations for mitigation. To date, additional mitigation measures recommended by Mr. Folkes have reduced indoor air concentrations below screening levels except in isolated areas where indoor sources are suspected and being evaluated.

***Mitigation of CO2 Impacts to School,** Midwest, WY.* Mr. Folkes was Project Director for the design and installation of a CO2 and petroleum vapor mitigation system at the public school in Midwest, WY. The CO2 emissions resulted from surrounding oilfield operations, which have been mitigated by the operator; however, the school board and the oilfield operator agreed that a sub-slab depressurization system should be installed at the school to control vapors resulting from any future releases. The system has been installed and performed as designed. Geosyntec's work also included development of occupational and school indoor air monitoring programs.

***Mitigation of Office Buildings over Petroleum Plume**, Fullerton, CA.* Mr. Folkes was Project Director for the evaluation and design of mitigation systems for two offices located over a shallow LNAPL plume from a neighboring former gas station. Although petroleum vapors are typically biodegraded in the vadose zone, the proximity of the LNAPL to the foundations of the buildings resulted in high BETX and methane concentrations under the slabs, with the potential for vapor intrusion impacts. Geosyntec

conducted diagnostic tests, evaluated venting versus depressurization options, and ultimately designed sub-slab depressurization systems meeting DTSC guidance requirements. The system includes explosion-proof fans and rooftop GAC units for off-gas treatment. The system was installed and was operating successfully when our work was completed.

Evaluation of Vapor Intrusion at Charter School, *Littleton, Colorado*. Mr. Folkes was the Project Manager for review of vapor intrusion investigations and mitigations for a school overlying contamination soil and groundwater due to releases from an adjacent service station. The role included review of indoor air, sub-slab vapor, and soil vapor data; evaluation of sources of VOCs found in indoor air; evaluation of sub-slab depressurization system performance; and collection of confirmatory indoor air samples.

Investigation and Mitigation of Warehouse*, Denver, CO.* Mr. Folkes is the Project Manager for the investigation and mitigation of vapor intrusion impacts in an existing warehouse, due to historic releases at a neighboring facility. Indoor air tests conducted prior to a new tenant signing a lease indicated elevated TCE readings within the warehouse. Time was of the essence, because mitigation of the vapor intrusion concern was required before the tenant would enter into a lease, with a planned move in date only three or four months out. Geosyntec conducted rapid sub-slab vapor testing on a grid pattern, using real-time analyses, which indicated that the soil vapor impacts were limited to an approximate 40,000 SF area. Mitigation diagnostic testing was then performed to assess the radius of influence for sub-slab depressurization, leading to fast-track design of a nine suction-point system with one high vacuum low flow blower. The tenant proceeded with signing the lease. The system was installed and has continued to meet target indoor air concentrations after two years of operation. Geosyntec also assisted with the oversight and review of groundwater investigations by the neighboring facility owner, including MiHPT investigations recommended by Mr. Folkes, to determine the source of the groundwater contamination and target remedial actions.

Review of Aerated Floor Design for Apartment Complex*, Italy.* Mr. Folkes was the Project Manager for review of mitigation conceptual designs and evaluation for a proposed new apartment development over highly contaminated soils, including the use of aerated floor systems and liners, and use of Johnson and Ettinger model to evaluate the potential for passive venting to achieve mitigation goals. The work was conducted through the prime consultant on the project.

Residential Area Adjacent to Former Chemical Plant, *Mt. Holly, NJ.* Mr. Folkes was the Project Director for vapor intrusion investigations in a neighborhood downgradient of a former chemical facility including soil vapor and indoor air testing. The results of tests and lines of evidence evaluation indicated that indoor air concentrations due to vapor intrusion, if any, were below action levels.

Multiple Residential & Commercial Buildings, *North Penn 12 Superfund Site, PA.* Mr. Folkes was the Project Director for vapor intrusion investigations in a neighborhood downgradient of the North Penn 12 Superfund site, including development of a vapor intrusion site conceptual model and vapor intrusion investigation work plan, which was approved by EPA Region 3. The results of testing, where access was granted, indicated no vapor intrusion impacts in any buildings tested, confirming the Site Conceptual Model that low permeability soils above bedrock and infilling of fractures in weathered bedrock were inhibiting vapor migration.

Investigation and Evaluation of Light Industrial Building, East Rutherford, NJ. Mr. Folkes was the Project Director for investigation and evaluation of vapor intrusion potential in an active commercial building where chlorinated solvents are present in shallow groundwater (within 2 feet of the building slab) adjacent to and under the building. The evaluation was conducted in a phased manner to limit any unnecessary indoor testing, by comparing groundwater and then sub-slab soil gas data according to NJDEP screening levels. Indoor air testing was ultimately required because concentrations exceeded screening levels, but was limited to compounds not being used by the manufacturing operation, as agreed by DEP. A line of evidence evaluation demonstrated that elevated indoor air concentrations of chloroform, PCE, and TCE were due to municipal water line leaks, ambient sources, and indoor sources, respectively.

Review of VI Research Proposals and Reports, SERDP/ESTCP Programs. Mr. Folkes was retained to review vapor intrusion research proposals and progress reports for the Department of Defense, as subcontractor to HydroGeoLogic. Work included review of proposals and reports related to real time measurement of VOCs in indoor at part per billion levels; development of procedures to screen buildings for vapor intrusion under with low permeability, high moisture content soils; and evaluation of the vapor intrusion pathway at a dedicated research home.

Former Manufacturing Buildings, Sao Paulo & Rio de Janeiro, Brazil. Mr. Folkes was the Project Director for the evaluation of vapor intrusion potential and mitigation alternatives at the sites of former manufacturing facilities. This included site visits and meetings with local environmental agencies, who agreed to a phased approach and lines of evidence evaluation process consistent with the approaches advocated by ITRC 2007 and EPA.

Residential & Commercial Buildings, *Orphan PCE Plumes, Casper & Cheyenne, WY.* Mr. Folkes was the Project Director for the evaluation of the nature and extent of several PCE orphan plumes in Casper and Cheyenne, Wyoming, for the Wyoming Department of Environmental Quality, including soil vapor testing using mobile lab facilities to evaluate the extent of impacts, indoor air and sub-slab testing in homes above the DEQ soil vapor action level (and adjacent buffer zone homes); and mitigation of residential

and commercial structures.

Evaluation and Mitigation of Recreational Facility, *Long Island City, NY.* Mr. Folkes was the Project Manager for vapor intrusion investigation and mitigation services at voluntary cleanup site including soil vapor, indoor air, and sub-slab vapor testing; evaluation of vapor intrusion impacts at a YMCA and other commercial buildings; technical support to community relations team; and oversight of the design, installation, and monitoring of vapor intrusion mitigation systems. The work was conducted under subcontract to the prime consultant on this project.

Vapor Intrusion Evaluation of Kodak Park, *Rochester, NY.* Mr. Folkes was the Project Manager for comprehensive vapor intrusion investigation services at Kodak Park, a major industrial complex with over one hundred commercial and industrial onsite buildings, as well as soil vapor and vapor intrusion investigations in residential and commercial areas around the complex. A tiered approach was developed to screen on-site and off-site areas and buildings based on existing groundwater data, followed by focused testing of worst-case buildings (including use of mobile laboratory for real time decision making). This limited testing to a small number of off-site and on-site buildings. The results of testing in three off-site residential areas led to no further action determinations by the state agencies. The results of on-site testing led to a no mitigation decision by the agency, provided the buildings remained in non-residential with no substantive change to floor or HVAC systems.

Residential Area Downgradient of Manufacturing Facility, *Aarschott, Belgium.* Mr. Folkes was the Project Manager for oversight of soil vapor investigations and evaluation of vapor intrusion mitigation options for various residential buildings, including review of previous investigation reports, development of a conceptual site model for the vapor intrusion pathway, and preparation of a mitigation decision tool. We provided on-sight supervision of a soil vapor testing pilot program, developed scopes of work for soil vapor testing, indoor air testing, and potential mitigation of residential homes, and evaluated the test results. Mr. Folkes also participated in a meeting with regulators as the team vapor intrusion expert.

Rocky Mountain Arsenal, *Denver, Colorado.* Mr. Folkes evaluated the results of vapor intrusion (Johnson-Ettinger) modeling for Colorado Department of Public Health and Environment, for prospective new developments at the Rocky Mountain Arsenal site. The modeling was conducted by the US EPA.

Waste Disposal Facility Design, Investigation, and Remediation

Drum Removal Action and Landfill Closure, *Erie, CO.* Mr. Folkes is the Project Director for investigations and remediation at a residential development, where over 1000 drums were found buried in an historic landfill discovered on a portion of the site,

containing MEK, toluene, and other hazardous substances. The drums and adjacent contaminated soils were removed under Geosyntec oversight as a time-critical removal action pursuant to a consent order the EPA in late 2017 and early 2018. Geosyntec conducted additional investigations to confirm the extent of the remaining non-drum waste, developed a site conceptual model, and is implementing groundwater remediation and landfill closure pursuant to a consent order with the Colorado Department of Public Health and Environment, to allow future use of the land as open space pursuant to an environmental covenant. Geosyntec provided CQA oversight for the installation of an evapotranspiration soil cover, which is complete except for revegetation.

Lagoon Leak Evaluation and Permitting, *confidential.* Mr. Folkes provided expert technical support for the evaluation of leaks from three existing, double-lined brine lagoons and two single-lined wastewater treatment lagoons at a food processing facility. The scope of work included preparation of relining plans for two of the brine lagoons and the development of lines of evidence demonstrating that the remaining lagoons were not leaking and met regulatory requirements. This included water balance calculations showing that brine leaking through the upper liner (as detected in the interstitial drainage layer sump system) was not leaking through the lower liner. Mr. Folkes assisted the facility in collaborative discussions with the regulatory agency regarding compliance of the lagoons with solid waste regulations. The relining plans were implemented under CQA oversight by Geosyntec, and the completed work was approved by the agency.

Engineering Design & Operations Plan, *Arvada, CO.* Mr. Folkes provided expert technical support for the development of an Engineering Design & Operations Plant (EDOP) for contaminated fill materials that were historically stockpiled at the site and now require closure under Solid Waste regulations, including management of TENORM and a demonstration of lack of impact to groundwater and design of a low permeability soil cover.

Technical Support, Oil Refinery & Gas Plant Cleanup, *Wyoming*. Mr. Folkes is assisting Wyoming Department of Environmental Quality (WDEQ) with oversight of investigations and cleanup by others at several former and operating refineries and gas plants across Wyoming, including the evaluation of existing landfills and design, construction, and closure of new Corrective Action Management Units (CAMUs). This work has included review of final covers for existing solid and industrial waste landfills; liner systems and soil covers for CAMUs, including evapotranspiration (ET) covers;

surface water conveyance and side slope stability; background sources of cover material; leachate and leak detection monitoring, and other issues.

Remedial Investigation and Evaluation of Remedial Alternatives, *Wamsutter, Wyoming.* Mr. Folkes was the Project Manager for evaluation of soil, groundwater, and vapor impacts at a former landfill, under the Targeted Brownfields Assessment program. Work included groundwater, soil, and vapor investigations, development of a hydrogeological conceptual site model, evaluation of the extent of impacts, and development and evaluation of remedial alternatives.

Lowry Landfill, *Colorado*. Mr. Folkes provided expert review to one of the settling parties at the Lowry Landfill for several years, including evaluation of cleanup costs and procedures for Coors Brewing Company, a party to the cleanup, on an annual basis. The scope has included evaluation of cap, groundwater containment, groundwater treatment, soil vapor recovery, and thermal technologies.

Municipal landfill, *Sheridan, Wyoming*. Mr. Folkes was Project Director for the evaluation of groundwater contamination and remedial alternatives at a closed landfill in Sheridan, WY, including nature and extent of solvent, petroleum, metal, and nutrient impacts.

Leaking Impoundment, Utility Plant, *Colorado Springs*. Mr. Folkes was the Principal Investigator of leaking double-lined (HDPE) impoundments. Investigations included pump test on interstitial drain system and back calculation of permeability of and seepage rates through the upper and lower liners of two impoundments. Successfully repaired by laying bituminous panels over top liner.

Evaluation of CBM Produced Water Impacts on Reserve Pit Soils, *Wyoming.* Mr. Folkes was the project director for a statistical evaluation of the potential impacts to soils due to produced water from Coal Bed Methane operations at 230 reserve pits in the Powder River Basin, which showed that the potential for impacts and sampling requirements could be based on site and produced water conditions.

Tailings Cleanup for Commercial Development, *Creede, Colorado*. Mr. Folkes was the Project Director for the evaluation of the impacts of fugitive gold mine and mill tailings on undeveloped land downstream of mining activities. Principal metals of concern were arsenic and lead. The work included soil sampling and preparation of cleanup plans that were implemented under the Colorado Voluntary Cleanup Program.

Lagoon Leakage Evaluation, *Colorado Springs, CO.* Mr. Folkes investigated the cause and rate of leakage from double-lined (HDPE) surface water impoundments in Colorado Springs. Investigations included a pump test on the interstitial drain system and back

calculation of permeabilities of and seepage rates through the upper and lower liners of two impoundments to allow comparison with permitted rates. The liner system was successfully repaired by laying bituminous panels over top liner.

***Lagoon Liner Evaluations and Repairs**, Kodak Colorado Facility, CO*. Mr. Folkes investigated the cause of slumping side slopes below the HDPE membranes of two wastewater treatment lagoons at the Kodak facility, prepared remedial designs to restore the slopes and liners, and oversaw the implementation of the repairs.

Environmental Site Assessments, Costing and Regulatory Support

Star Lake Canal Superfund Site, Cost Allocation Support, *Port Neches, TX.* Mr. Folkes was the project director and a principal investigator assisting one of the PRPs at the Star Lake Canal Superfund Site with cost allocation evaluations being conducted by the PRP group. Costs were principally associated with sediments in canals and natural waterways impacted by historic discharges of wastewater and runoff from various chemical, petroleum, and synthetic rubber manufacturing operations, and other sources. The compounds of concern include metals, pesticides, PCBs, VOCs, and PAHs. Potential receptors include benthic invertebrates and upper trophic level receptors. Issues evaluated include the relative contributions of each property and/or operation to COCs in sediments over time, including transport pathways and mechanisms.

Stratus Redtail Ranch ESA, *Erie, CO.* Mr. Folkes was project director for a Phase I ESA that included 422 acres of undeveloped land adjacent to two existing and one closed landfill, including an historic landfill on the subject property that had impacted soils and groundwater due to releases from hundreds of drums containing hazardous substances (recognized environmental conditions or RECs). Historic RECs included soils impacted by oil and gas operations, that were subsequently removed, and de minimis conditions included ongoing oil and gas operations and historic coal mining below the site. The adjacent landfill operations were considered business environmental risks because the landfills were being monitored and controlled under state oversight. Mr. Folkes oversaw the removal of the drums under an EPA time-critical removal action. The historic landfill and remaining groundwater contamination is being addressed by Geosyntec pursuant to state solid waste regulations. Residential housing is planned for the remaining property.

Phase I and Phase II Environmental Site Assessments, *various locations, Colorado.* Mr. Folkes was project director for Phase I and Phase II ESAs related to undeveloped and vacant land, former automotive service and manufacturing facilities, a laboratory, and warehouse buildings. Phase II activities, including soil vapor, soil, groundwater sampling were conducted in some cases concurrently with Phase I ESAs to evaluate impacts at facilities with known current or historical releases. No Action Determination (NAD)

applications under the Voluntary Cleanup Program were prepared for several sites and approved by CDPHE.

Industrial Property ESA and VI Screening, *Englewood, CO and Niles, IL.* Mr. Folkes was the project principal for Phase I ESAs conducted at manufacturing and warehouse properties in Colorado and Illinois. Vapor intrusion screening was also performed pursuant to ASTM E 2600-08.

Various Due Diligence and ESAs*, US.* Mr. Folkes has overseen a number of Phase I ESAs for a variety of land uses and clients and provided technical support on a number of due diligence investigations and audits at industrial and mining properties across the US. He has also reviewed a number of Phase I ESAs by others to support Voluntary Cleanup applications, Phase II investigations, and other activities.

Crescent Point Energy U.S. Corp v. III Exploration II LP and Wilmington Trust, N.A.*, arbitration matter in Utah.* Mr. Folkes was an expert witness for the plaintiff in this matter, evaluating the nature and extent of environmental impacts at an oil and gas field and potential costs of remediation, to support an environmental defect claim. Issues included soil contamination due to repeated leaks from high-pressure water injection lines and required closure of several mud pits.

Evaluation of Environmental Costs, *Multiple States.* Mr. Folkes was Project Manager and a consulting expert for the Asarco Incorporated bankruptcy creditors committee. The work included evaluation of reasonable costs for addressing remaining environmental issues at various mine, mill, and smelter sites in Colorado, New Mexico, Arizona, Missouri, Texas and other states. Issues included soil and groundwater contamination at mine sites, tailings pile closure and soil contamination at offsite properties.

Evaluation of Potential RCRA Issues at a Mine and Mill Site, *Alaska.* Mr. Folkes evaluated the potential for various operations and materials generated at a mine and mill site to be considered hazardous wastes under RCRA, including consideration of the extent to which wastes were Bevill exempt.

HRS Evaluation of Smelter Site, *Arizona.* Mr. Folkes evaluated the potential Hazard Ranking System score of a copper smelter site under CERCLA, based on observed and potential impacts to soil, groundwater, surface water, and air from smelter operations, including tailings disposal. The work included recommended actions to improve environmental conditions and, at the same time, reduce the potential HRS score, prioritized by cost and benefit.

HRS Evaluation of Pipeline Facility, *US.* Mr. Folkes provided expert review of hydrogeological issues surrounding the Hazard Ranking System scoring of a pipeline

facility, including client representation at a meeting with EPA. Specific issues included evaluation of the existence of an aquifer discontinuity as defined by the NCP.

Litigation Support

Adams, et al., Ryan et al., and Shepard et al. v Guardian Automotive Corporation, *GA.* Mr. Folkes provided expert witness services to the defendants in this matter, including evaluation of and opinions regarding the conformance of vapor intrusion mitigation system exhaust stacks with standard practice, the effects of a clean water lens on the extent of vapor intrusion impacts, the contributions of preferential pathways to vapor migration, and other issues. Mr. Folkes was deposed by plaintiffs in March 2023 and gave trial testimony in March 2024. The matter has been settled.

Lockman v Pioneer Natural Resources, Montana. Mr. Folkes provided expert witness services to an oil and gas production company in the US regarding alleged impacts to soil and groundwater due to historic brine and petroleum releases, including evaluation of remedial alternatives and cleanup costs. Mr. Folkes was deposed by plaintiffs in January 2023. The matter has been settled.

Corbett v City of Kensington, KS, and Cunningham Sandblasting & Painting, *KS.* Mr. Folkes provided expert support to defendants regarding the alleged contamination of plaintiff's property due to the alleged deposition of lead-based paint chips during sandblasting of the City of Kensington's water tower. Work included review of available information, analytical data, and the deposition testimony of plaintiffs, interviewing a representative of Cunningham Sandblasting & Painting, CO., Inc., and preparation of an affidavit. No deposition or trial testimony was required. The court dismissed the case in favor of the defendants in early 2022.

Appeal of Proposed Effluent Limits, Mining Operation, *CO.* Mr. Folkes is providing consulting expert and potentially testifying support to outside counsel for a mining company that is appealing proposed new effluent limits for point source discharges to a creek in Colorado. The issues being considered include water quality and flow conditions prior to January 2000 (a baseline for assessing impacts), background creek and groundwater concentrations of certain ions and metals, potential impacts of creek water on nearby floodplain domestic water supply wells, and the costs and impacts that would be associated with installation of additional treatment systems. The matter is ongoing.

Stratus Redtail Ranch, LLC vs. IBM and WWD, LLC, *US District Court, District of Colorado.* Mr. Folkes was an expert witness for the plaintiff, providing opinions regarding the necessity, efficacy, and reasonableness of work required to remove over 1000 drums and contaminated soils from a historic landfill in Erie, Colorado, pursuant to

a time-critical removal action consent order between the U.S. EPA and Stratus Redtail Ranch, LLC. The removal action was successfully completed in 2018, and the cost recovery matters settled in 2022.

Dennis Taylor, et al vs. Michelin North America, Inc. et al, *US District Court, Northern District of Oklahoma.* Mr. Folkes was an expert witness for the defendants, evaluating historic reports and data and providing opinions regarding the extent of LNAPL and dissolved contamination in groundwater due to historic releases of mineral spirits from underground storage tanks at a former BF Goodrich plant, as well as the efficacy of planned remedial actions and the potential for petroleum vapor intrusion in offsite residential buildings. Mr. Folkes provided deposition testimony in this matter, which has settled.

Sonrisa Holdings and Ortega vs. Circle K Stores, *US District Court, District of Colorado.* Mr. Folkes was an expert witness for the defendants, evaluating historic reports and data and providing opinions regarding the potential for petroleum vapor intrusion at the site and the need for and efficacy of mitigation systems that were installed below a multi-family building and parking garage on property adjacent to the gas station where the petroleum release occurred. Mr. Folkes provided deposition testimony in this matter, which has been dismissed.

Crescent Point Energy U.S. Corp v. III Exploration II LP and Wilmington Trust, N.A.*, arbitration matter in Utah.* Mr. Folkes was an expert witness for the plaintiff in this matter, evaluating the nature and extent of environmental impacts at an oil and gas field and potential costs of remediation, to support an environmental defect claim. Issues included soil contamination due to repeated leaks from high-pressure water injection lines and required closure of several mud pits.

Diamond X Ranch LLC vs. Atlantic Richfield Company, *US District Court, District of Nevada.* Mr. Folkes was an expert witness for the defendants in a case related to the alleged impacts of historic mining operations on stream water quality and pastures irrigated by water from the stream. He has provided opinions related to the nature and extent of soil impacts due to historic irrigation, the costs of soil remediation, and the need for irrigation water treatment in the future. Mr. Folkes provided deposition testimony in this matter, which settled.

Behr Dayton Thermal Products LLC Litigation, *US District Court, Southern District of Ohio, Western Division.* Mr. Folkes is an expert witness for the defendants in a class action lawsuit in Dayton, OH related to vapor intrusion resulting from chlorinated solvents in groundwater. He has evaluated and provided opinions related to the nature and extent of groundwater contamination at the site, the potential for vapor intrusion

including the vapor intrusion pathway and factors that cause indoor air impacts to vary from building to building, the efficacy of vapor intrusion mitigation systems, the potential contributions of background sources to solvents observed in groundwater and indoor air, and on other matters. Mr. Folkes produced expert reports and declarations on the matter but was not deposed by plaintiffs.

Graham et al, v. BNSF, *US District Court, Southern District of Montana, Missoula Division.* Mr. Folkes was an expert witness for BNSF, the defendant in this multi-party lawsuit related to alleged groundwater contamination and vapor intrusion resulting from historic releases of creosote and petroleum products at a former tie treatment plant site in Somers, MT. He evaluated and provided opinions related to the nature and extent of soil vapor impacts due to groundwater contamination, including dissolved phase and NAPL sources; the vapor intrusion pathway and mechanisms causing the attenuation of volatile petroleum compounds in the vadose zone; the likelihood that petroleum compounds measured in indoor air were due to outdoor air and/or indoor sources; and other matters. Mr. Folkes provided deposition testimony in this matter, which settled.

Christian et al., v. BP Amoco et al., *Montana Second Judicial District Court, Silver Bow County.* Mr. Folkes was an expert witness for defendants in a multi-party action related to alleged soil and groundwater contamination at properties in and near Opportunity, MT resulting from historic releases from the Anaconda smelter NPL site. He evaluated and provided opinions related to the nature and extent of arsenic and other metals in soil and groundwater due to historic mining and smelter activities, the transport mechanisms and pathways, reasonable abatement issues, the likely costs of remediation, and other matters. Mr. Folkes provided deposition testimony in this matter, which has settled.

City of San Diego v. Kinder Morgan Energy Partners, L.P.*, US District Court, Southern District of California.* Mr. Folkes was an expert witness for the defendants in this cost recovery action related to alleged impacts of petroleum contamination on the feasibility and costs of redeveloping the Qualcomm Stadium property. He evaluated and provided opinions related to the efficacy of vapor intrusion mitigation technologies, including available technologies and typical practices over the time period of concern, and the common use of vapor intrusion mitigation at Brownfield and similar contaminated sites undergoing redevelopment. Mr. Folkes provided deposition testimony in this matter, which was dismissed in favor of defendants.

La Plata County v. Brown Group Retail, Inc., *US District Court, District of Colorado.* Mr. Folkes was an expert witness for the defendants in this cost recovery case related to the historic releases of chlorinated solvents from lens manufacturing operations and the alleged costs of remediation. He evaluated and provided opinions on the likely sources

of contamination, the likely contributions of County actions during site redevelopment to soil and groundwater contamination, the nature and extent of contamination, the extent to which remediation was necessary, the reasonable cost of remediation, and other matters. Mr. Folkes provided deposition and trial testimony in this matter. The Court found that the County contributed to contamination at the site and agreed with Mr. Folkes' approach to remediation.

Gloria Ned et al., v. Union Pacific Corporation, PPG Industries, et al., *Fourteenth Judicial District Court, Calcasieu Parish, Louisiana.* Mr. Folkes was an expert witness for defendants in this multi-party case, where a PCE leak from a rail car in 1983 was alleged to be causing ongoing ambient air and vapor intrusion impacts to residents in the surrounding area. He evaluated and provided opinions related to potential concentrations of PCE in ambient air levels due to diffusion through the vadose zone, and other matters. Mr. Folkes provided deposition and hearing (mini-trial) testimony in this matter.

Cindy King et al., v. Hamilton Sundstrand Corporation, *Adams County District Court, Colorado.* Mr. Folkes was an expert witness for the defendant in a class action lawsuit related to alleged vapor intrusion impacts resulting from chlorinated solvents in groundwater. Mr. Folkes provided opinions on the nature and extent of groundwater contamination from the Hamilton Sundstrand facility, the efficacy of groundwater remediation at the site, the vapor intrusion pathway and factors that cause indoor air impacts to vary from building to building, the extent of vapor intrusion impacts due to the facility, the contributions of background sources to solvents observed in groundwater and indoor air, and other matters. Mr. Folkes provided deposition and class certification hearing testimony. The case settled.

Antolovich et al., v. Brown Group Retail Inc. et al., *Colorado District Court, County of Denver.* Mr. Folkes was an expert witness for the defendant during class certification for this matter related to alleged vapor intrusion impacts resulting from chlorinated solvents in groundwater. He evaluated and provided opinions on the nature and extent of groundwater contamination and vapor intrusion due to historic releases from the Redfield Rifle Scope site, the likely contributions of other sources to solvents in groundwater and indoor air, the degree to which these conditions varied across the alleged class area, and other matters. He provided deposition and hearing testimony in this matter. The class including the owners of approximately 1000 homes was certified, and Mr. Folkes provided deposition and trial testimony as a fact witness (Mr. Folkes was the project manager for investigation and mitigation work at the site). The jury found Brown Group liable, but only for damages of approximately $1 million, compared to claimed damages of approximately $300 million dollars.

Escamilla et al. v. ASARCO, Inc., *Colorado District Court, County of Denver.* Mr. Folkes was an expert and fact witness for the defendant, ASARCO Inc., in this class action lawsuit concerning alleged contamination of surface soils in the neighborhoods surrounding the Globe Plant, a former lead smelter and (at the time) operating specialty metals refinery. He evaluated and provided opinions related to the cleanup plans and background levels of metals in soils. Mr. Folkes provided deposition and trial testimony. Case was settled.

Louisiana-Pacific Corporation et al, v. ASARCO INCORPORATED, *US District Court, Western District of Washington at Tacoma.* Mr. Folkes was an expert witness for defendants in this cost recovery case related to alleged impacts of slag used to construct log sort yards on groundwater and surface water. He evaluated and provided opinions on the nature and extent of contamination and reasonable approaches and costs for remediation. Mr. Folkes provided deposition and trial testimony (both liability and damage phases).

PROFESSIONAL EXPERIENCE

Geosyntec Consultants, Denver, CO, October 2012 - present
EnviroGroup Limited, Denver, CO, July 1991 – September 2012 (acquired by Geosyntec)
TRC Environmental Consultants, Inc., Denver, CO, 1986 - 1991
Hydro-Search, Inc., Denver, CO, 1985 – 1986
Komex Consultants, Inc./Piteau & Associates, Inc., Denver, CO, 1983 – 1985
Komex Consultants Ltd., Calgary, Alberta, Canada, 1980 – 1983
Golder Associates Ltd., Toronto, Ontario, Canada, 1977 - 1980

ACHIEVEMENTS

W.S. Wilson Award, first place standing in Geological Engineering graduating class, University of Toronto, 1977.

National Research Council of Canada, "young engineer" selected to prepare 5th Canadian Geotechnical Colloquium, presented at the 34th Canadian Geotechnical Colloquium, Fredericton, New Brunswick, 1981.

Outstanding service award, Interstate Technology & Regulatory Council (ITRC) vapor intrusion team, 2005.

Geosyntec consultants

AFFILIATIONS

ITRC Vapor Intrusion Evaluation & Mitigation Team, January 2024 – present
ITRC Vapor Intrusion Mitigation Training Team member and instructor, 2019 – 2025
ITRC Petroleum Vapor Intrusion Team member and instructor, 2012 – 2020
ITRC Vapor Intrusion Team member and instructor, 2004 - 2011
ASTM Vapor Intrusion Task Group, 2006 – 2010
EPA ad-hoc expert work group on Vapor Intrusion Guidance, 2000 - 2017
Wyoming DEQ Voluntary Remediation Program (VRP) Remedy Work Group 2003 - 2004
Denver Dept. of Environmental Health Residential Arsenic Technical Advisory Group 2001

BOOK CHAPTERS & PEER REVIEWED PAPERS

Folkes, D. and C. Sanpawanitchakit. 2011. *Modeling of Vapor Intrusion Mitigation, In* S. Saponaro, E. Sezenna and L. Bonomo (Eds.), Vapor Emission to Outdoor Air and Enclosed Spaces for Human Health Risk Assessment: Site Characterization, Monitoring and Modeling, Nova Publishers.

Folkes, D.J., Helgen, S.O., and R.A. Litle, 2000. "Impacts of Historic Arsenical Pesticide Use on Residential Soils in Denver, Colorado", 4th International Conference on Arsenic Exposure and Health Effects, San Diego

Folkes, D., W. Wertz, J, Kurtz, and T. Kuehster, 2009. Observed Spatial and Temporal Distributions of CVOCs At Colorado and New York Vapor Intrusion Sites, Groundwater Monitoring and Remediation, 29, No. 1, Winter 2009.

Folkes, D.J., Kuehster, T.E., and R.A. Litle, 2001. "Contributions of Pesticide Use to Urban Background Concentrations of Arsenic in Denver, Colorado", Environmental Forensics, v.2, pp127-139.

Folkes, D.J. and J.H.A. Crooks, 1985. "Effective stress paths and yielding in soft clays below embankments", Canadian Geotechnical Journal, Vol. 22. pp 357-374.

Folkes, D.J., 1981. "Control of contaminant migration by the use of liners: 5th Canadian Geotechnical Colloquium", Canadian Geotechnical Journal, Vol. 19, pp 320-344.

Geosyntec consultants

GUIDANCE DOCUMENT CONTRIBUTIONS

Colorado Department of Public Health and Environment, Methane Intrusion Guidance, co-author and project director, 2023.

Colorado Department of Public Health and Environment, Vapor Intrusion Guidance, principal author, 2020.

ITRC Vapor Intrusion Mitigation Training Fact Sheets, Conceptual Site Model work group co-leader, process design fact sheet team member, and contributing author, 2021.

Wyoming Department of Environmental Quality, Vapor Intrusion Fact Sheet, Voluntary Remediation Program, principal author, 2018.

ITRC Petroleum Vapor Intrusion Guidance (2014). Contributing author.

EPA Evaluation of Empirical Data to Support Soil Vapor Intrusion Screening Criteria for Petroleum Hydrocarbon Compounds, Office of Underground Storage Tanks, Washington, D.C., January 2013. Invited external peer reviewer.

New Jersey Department of Environmental Protection (NJDEP), revised Vapor Intrusion Guidance, mitigation and general sections (2012 revisions to guidance). Invited external peer reviewer.

EPA Superfund Vapor Intrusion FAQs document, 2011. Invited external peer reviewer.

California EPA, DTSC Vapor Intrusion Mitigation Advisory, December 2008. Invited external peer reviewer.

Vapor intrusion portions of the ASHRAE Indoor Air Quality Guide: Best Practices for Design, Construction, and Commissioning, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., February 2008 Draft. Invited external peer reviewer.

ASTM E2600-08 Standard Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions, April 2008, co-leader of vapor intrusion evaluation work group and contributing author.

Minnesota Risk Based Guidance for the Vapor Intrusion Pathway, February 2008 draft, Minnesota Pollution Control Agency Remediation Division. Invited external peer reviewer.

ITRC Vapor Intrusion Pathway: A Practical Guideline, 2007. Contributing author.

Geosyntec consultants

Colorado Petroleum Hydrocarbon Vapor Intrusion Guidance Document, published December 11, 2007, Colorado Department of Labor and Employment, Division of Oil and Public Safety, Remediation Section. Invited external peer reviewer.

Draft Revised EPA Spreadsheet for the Implementation of the J&E model, 2006. Invited beta tester and reviewer.

Design and construction of liners for municipal wastewater stabilization ponds, 1983. Guidance author, prepared for Alberta Environment.

CONFERENCE & SEMINAR PAPERS & PRESENTATIONS

Folkes, D., 2024. The Practice of VI Mitigation – Past, Present, & Future, presented at the Midwest States Environmental Consultants Association (MSECA) Virtual Conference, December 12, 2024.

Folkes, D., Hers, I., Johnson, P. and T. McAlary, 2024. Vapor Intrusion: Past, Present, and Future, expert panel moderated by T. McHugh at Battelle 13th Int. Conf. on Remediation of Chlorinated and Recalcitrant Compounds, Denver, June 6.

Folkes, D., McAlary, T., and E. Lovenduski, 2024. The importance of flow and mass removal rates in vapor intrusion mitigation design, poster presentation at Battelle 13th Int. Conf. on Remediation of Chlorinated and Recalcitrant Compounds, Denver, June 2-6.

Apostolopoulos, F., Clark, S., Folkes, D, and M. Hashem, 2023. Safe and Successful Development at Methane-Impacted Brownfield Sites, presented at the Colorado Brownfields Conference, June 12, 2023.

Folkes, D., 2023. Long-term Stewardship of Residential Mitigation Systems by Radon Monitoring, US EPA State of Vapor Intrusion Science Workshop, AEHS 32nd Annual International Conference of Soil, Water, Energy, and Air, March 21, 2023, San Diego, CA.

Folkes, D., 2022. Engaging Communities in Vapor Intrusion Programs: Redfield Site Case History. Invited presentation at the U.S. EPA "State of VI Science" Workshop 2022, 31st Annual International Conference on Soil, Water, Energy, and Air, A Virtual Conference, March 15, 2022.

Folkes, D. and C. Holton, 2019. Subsurface (Vapor) Intrusion in the Hazard Ranking System, presented at the American Bar Association, Section of Environment, Energy, and Resources Law 48th Spring Conference, Denver, CO, March 2019.

Egarr, D., Horton, L., Folkes, D., and T. Kuehster, 2017. Assessment of an Aerated Floor System for Mitigating Vapor Intrusion, presentation at 4th Int. Symposium on Bioremediation and Sustainable Environmental Technology, Miami FL, May 2017.

Folkes, D., 2017. Vapor Intrusion Mitigation by Passive Venting of Aerated Floors, Presentation at the RemTEC Remediation Technology Summit, Denver, CO, March 2017.

Folkes, D., McAlary, T., Ettinger, R., and H. Dawson, 2016. A Rational Approach to Vapor Intrusion "Preferential Pathway" Definition and Evaluation, Presentation at Battelle Tenth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, CA, May 2016.

Folkes, D. and D. Tripp, 2016. The Value of an Iterative Approach to VI Evaluation and Mitigation: Lessons Learned at the CRREL Facility in Hanover, NH, Presentation at Battelle Tenth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Palm Springs, CA, May 2016.

Fitzgerald, L., Daprato, R., and D. Folkes, 2015. Performance of an Active Aerated Floor Vapor Intrusion Mitigation System in a Large Building. Poster presentation at Battelle 3rd International Symposium on Bioremediation and Sustainable Environmental Technologies, Miami, FL, May 2015.

Folkes, D. and R. Ettinger, 2014. Influence of sub-slab permeability and void volume on temporal variability of indoor air concentrations due to vapor intrusion. Poster presentation at Battelle Ninth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, May 2014.

Folkes, D.J., 2013. Vapor Intrusion Mitigation Using Cupolex Aerated Floors, presented at the Colorado Department of Public Health and Environment, April 10. 2013.

Folkes, D.J., T. Kuehster, and E. Lovenduski, 2012. Performance of Aerated Floor Systems, Passive Venting Mode, presented at AWMA Vapor Intrusion conference, Denver, CO, October 3-4, 2012.

Folkes, D.J., 2012. Performance of Aerated Floor VI Mitigation Systems, presented at AEHS 22nd Annual International Conference on Soil, Water, Energy, & Air, San Diego, CA, March 20, 2012.

Folkes, D.J., 2012. Modeling of Vapor Intrusion Mitigation, proc. of International Conference on Sites Contaminated by Volatile Pollutants, at 9th International Symposium of Sanitary and Environmental Engineering, Milan, Italy, June 28, 2012.

Folkes, D.J., 2011. Design of Passive and Sustainable Vapor Intrusion Mitigation Systems, presented at the Battelle International Symposium on Bioremediation and Sustainable Environmental Technologies, Reno Nevada, June 27-30, 2011.

Folkes, D.J., 2008. Strategic Approach to Vapor Intrusion Mitigation, presented Air Force Center for Environmental Excellence (AFCEE) Technology Transfer Workshop, San Antonio, March 2008.

Folkes, D.J., J.P. Kurtz, and C. Sanpawanitchakit, 2007. Lateral Extent of Vapor Intrusion Impacts, presented at the AWMA Vapor Intrusion Conference, Providence, RI September 26-28, 2007

Folkes, D.J., E.J. Wannamaker, and J.P. Kurtz, 2006. Vapor Intrusion Attenuation Factors Based on Long Term Indoor Air Data, 22nd International Conference on Soils, Sediments and Water – University of Massachusetts, Amherst, October 19, 2006

Folkes, D.J., 2006. Discerning Background Sources from Vapor Intrusion. Presented at the Minnesota Pollution Control Agency seminar on vapor intrusion, St. Paul, MN, June 2006 (revised from Folkes and Kurtz, 2005).

Folkes, D.J., 2006. Vapor Intrusion: Site Characterization and Screening. Presented at the New England Waste Management Officials' Association (NEWMOA) Workshop on Vapor Intrusion in Chelmsford, MA, April 2006.

Folkes, D.J., 2006. Vapor Intrusion Mitigation Methods and Strategies. Presented to Wyoming DEQ (Cheyenne, March 2006), Colorado DPHE (Denver, March 2006), Minnesota PCA (St. Paul, June 2006).

Folkes, D.J., 2006. Screening and Evaluating Sites for Vapor Intrusion. Presented at the ASTM Vapor Intrusion Task Group meeting in Phoenix, AZ, February 2006.

Folkes, D.J., 2005. Vapor Intrusion: Redfield Site Case History. Presented at Brownfields 2005, Denver, Colorado, Nov 2005 and RTM Brownfields conference, Washington D.C., March 2006.

Folkes, D.J., 2005. Vapor Intrusion: Real World Observations and Lessons Learned. Presentation to the New Jersey Department of Environmental Protection, Trenton, NJ, August 2005.

Folkes, D.J. and J.P. Kurtz, 2005. Discerning Background Sources from Vapor Intrusion. STL Seminar on Vapor Intrusion, Los Angeles, CA, Oakland, CA, and Edison, NJ, 2005.

Kurtz, J.P. and D.J. Folkes, 2005. Discerning Background Sources of VOCs from Vapor Intrusion Sources using Multiple Lines of Evidence. Presented at the Battelle 8th International In-Situ and On-Site Bioremediation Symposium, Baltimore, MD, June 2005.

Arell, P.A. and D.J. Folkes, 2004. The Superfund Hazard Ranking System and Mining Sites, accepted for presentation at the SME Conference in Denver, 2004.

Kurtz, J.P., D.J. Folkes, and T.E. Kuehster, 2004. Approaches to Quantification of Background VOCs in Indoor Air. Presented at the Midwestern States Risk Assessment Symposium, Indianapolis, August 2004.

Kuehster, T.E., D.J. Folkes, and E.J. Wannamaker, 2004. Seasonal Variation of Observed Indoor Air Concentrations Due to Vapor Intrusion. Presented at the Midwestern States Risk Assessment Symposium, Indianapolis, August 2004.

Kurtz, J.P., D.J. Folkes, and T.E. Kuehster, 2004. A COC Ratio Approach for Defining Extent of Vapor Intrusion and Background. Presented at the EPA Vapor Intrusion Work Shop, San Diego, March 2004.

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Folkes, D.J., 1991. "Technical strategies for reducing CERCLA risks: coping with the new Hazard Ranking System", presented at the National Western Mining Conference, Denver, February 1991.

Folkes, D.J., 1988. "Evaluating the existence, nature and extent of environmental liabilities and risks: getting the facts", Paper 5, Rocky Mountain Mineral Law Foundation Institute on Environmental Considerations in Natural Resource and Real Property Transactions, Denver, Colorado.

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Folkes, D.J., 1983. "Lagoon liners: design and construction considerations", proceedings of the 1983 Western Canada Water and Sewerage Conference, co-sponsored by the American Water Well Association, Edmonton, Alberta.

Folkes, D.J., D.G. Fisher and R.K. Rowe, 1982. "Applications of geotextile reinforcement in artificial island construction", presented at the Texel Seminar on Geotextile Applications in Artificial Island Construction, Calgary, Alberta.

Kenney, T.C. and D.J. Folkes, 1979. "Mechanical properties of soft soils", State-of-the-Art Report, Proceedings of the 32nd Canadian Geotechnical Conference, Quebec City, Quebec.

ATTACHMENT B

RESUME OF SUZANNE V. GABRIELE

SUZANNE V. GABRIELE

transactional due diligence
environmental site assessment and remediation
EHS planning and compliance assurance
EHS management systems

EDUCATION

B.S., Industrial Engineering, Lehigh University, Bethlehem, PA, 1988

REGISTRATIONS AND CERTIFICATIONS

Environmental Site Assessments for Commercial Real Estate, ASTM International

ISO 14001:2015 / 45001:2018 Lead Auditor for International Environmental and Occupational Safety and Health Management Systems, QAI – Training for Quality

Equitable Origin EO100™ Standard for Responsible Energy Development Certified Lead Assessor

The Complete Environmental Regulations Workshop, Lion Technology

RCRA Fundamentals and Critical Generator Issues, McCoy and Associates, Inc.

The Essentials of Colorado Environmental Law for Non-lawyers, University of Colorado at Denver

Engineer-in-Training, Pennsylvania

CAREER SUMMARY

Suzanne Gabriele is a Senior Principal Consultant based in Colorado with more than 35 years of experience focused on environmental, health, safety (EHS) management for a variety of industries including manufacturing, mining, oil & gas, food processing, electrical and natural gas utilities, and municipal governments.

Ms. Gabriele directs environmental site assessment, investigation and remediation projects including planning, permitting, sub-contractor management, interaction with business and community representatives, review and evaluation of data, and preparation of reports. She has training and experience in completing Phase I Environmental Site Assessments (ESAs) in accordance with EPA's All Appropriate Inquiry/ASTM E1527 requirements and meets the

qualifications of Environmental Professional. She has also prepared Quality Assurance Project Plans, served as Quality Assurance Manager for complex environmental investigation and remediation projects, established in-house protocols for data validation, and directed data usability review projects.

Ms. Gabriele also has extensive experience helping clients manage risks and recognizing opportunities to improve EHS performance. Examples of Ms. Gabriele's experience include managing numerous policy and management system development, implementation, and improvement projects including systems conforming to and certified under International Organization for Standardization (ISO) standards. Ms. Gabriele also has managed numerous projects where the U.S. Environmental Protection Agency (EPA) compliance-focused environmental management system standard is required. Ms. Gabriele's practice includes advising on operational management plans, and performance and compliance monitoring and auditing programs.

In addition, Ms. Gabriele has extensive knowledge of regulatory programs including those promulgated under the Resource Conservation and Recovery Act (RCRA), Emergency Planning and Community Right to Know Act (EPCRA), Clean Air Act (CAA), Clean Water Act (CWA), and Toxic Substance Control Act (TSCA) and the ways in which their regulations apply in the built world. Ms. Gabriele works with clients to design programs to manage obligation under these laws as well as the Occupational Safety and Health Act, and also other obligations such as those related to environmental, social, and governance (ESG) initiatives. She directs and manages compliance audit programs and supports clients in identifying root cause and corrective actions for noncompliance.

Transactional Due Diligence

Environmental Site Assessments and Limited Environmental Compliance Review, *Confidential Client, Multiple Colorado Locations.* Ms. Gabriele directed transactional due diligence projects for this client acquiring a health services network that included three medical centers comprised of multiple buildings, seven medical office buildings, and associated parking for guests and staff.

Environmental Site Assessments, *Confidential Client, Multiple Nevada Locations.* Ms. Gabriele directed transactional due diligence projects for this client acquiring mining and aggregate processing operations.

Environmental Site Assessments, *Confidential Client, Confidential Locations.* Ms. Gabriele served as senior advisor for Phase I and II environmental site assessments of agricultural properties.

Environmental Site Assessments, *Confidential Client, Multiple US Locations.* Ms. Gabriele directed transactional due diligence projects for this client acquiring retail companies with facilities across the U.S. Up to 40 facilities were evaluated simultaneously during these portfolio projects for this client.

Limited Compliance Reviews, *Confidential Client, Multiple US Locations.* Ms. Gabriele served as senior technical advisor during a transactional due diligence project for this construction materials client. Geosyntec's scope of services included limited EHS compliance reviews for 12 of the 75 facilities included in the transaction.

Limited Compliance Reviews, *Confidential Client, Multiple US Locations.* Ms. Gabriele served as senior technical advisor during a transactional due diligence project for this food and beverage industry client. Geosyntec's scope of services included limited environmental compliance reviews for all of the 23 facilities included in the transaction.

Environmental Site Assessment, *Confidential Client, Confidential Location.* Ms. Gabriele managed Phase I and Phase II ESAs of a facility with the potential to discharges per- and polyfluoroalkyl substances (PFAS). Soil and groundwater samples were collected for PFAS analysis as part of the Phase II ESA.

Environmental Site Assessment, *Confidential Client, Denver, Colorado.* Ms. Gabriele managed a Phase I and limited Phase II ESA project in Denver's transitional River North (aka RiNo) neighborhood. The site was historically used for truck leasing and maintenance as indicated by the presence of a hydraulic lift, trench drains, and underground oil/water separator on site. Historic site uses also included a wholesale plumbing sales business, which was a RCRA generator. The client was considering a long-term lease for the vacant industrial building for use a restaurant and was concerned with human health risk to patrons.

Environmental Site Assessment, *Printed Circuit Board Manufacturing Facility, Tempe, Arizona.* Ms. Gabriele managed a Phase I ESA of a printed circuit board manufacturing facility for the site operators where a limited Phase II ESA conducted by others indicated that measurable concentrations of arsenic were present in the on-site soils in the vicinity of the facility's wastewater treatment system. With the results of the Phase I ESA in-hand, the client was able to sell the operation.

Environmental Site Assessment, *Fitzsimons Army Medical Center, New Century Energies, Denver, Colorado.* Ms. Gabriele managed a comprehensive Phase I ESA at this former military medical complex for the local electric and gas utility who was considering purchasing the existing utility easements as well as future utility easements as part of Base Realignment and Closure process.

Environmental Site Assessment, *Confidential Client, Multiple Colorado and North Dakota Facilities.* Ms. Gabriele managed Phase I ESAs of an electrical generator manufacturing plant, a diesel engine rebuild plant, and an O&G field service support operation.

Environmental Site Assessment, *Ferrari, Maserati, Bentley, Lotus of Denver, Highlands, Colorado.* Ms. Gabriele managed a Phase I ESA at an automobile dealership that included a service and repair shop.

Environmental Site Assessment, *Bachman Drilling and Production Specialties Facility, Fruita, Colorado.* Ms. Gabriele managed a Phase I and supported on a Phase II ESA at this chemical blending and distribution facility.

Environmental Site Assessment, *Underground Natural Gas Storage Facility, Leyden, Colorado.* Ms. Gabriele managed a comprehensive Phase I ESA at the only facility in North America storing natural gas in an abandoned coal mine.

Environmental Site Assessment and Remediation

Remedial Alternatives Evaluation, Investigation, and Action, *Casper PCE Plumes Orphan Site, Casper, Wyoming* – Ms. Gabriele is managing scope, schedule and budget for remediation of a two-mile long, multi-source chlorinated solvent plume. Remedial alternatives for the groundwater source zone, river protection, and soil vapor control were evaluated and recommended; remedial investigations were completed; and remedial actions are being implemented. Technologies include a soil vapor extraction (SVE) system, enhanced in-situ bioremediation (EISB), and monitored natural attenuation (MNA). In addition, Ms. Gabriele has completed Pollution Prevention (P2) audits of the existing drycleaner operation as part of remedial investigations. The plume spans beneath much of the City and public outreach and community engagement are routine aspects of the project.

Quality Assurance, *Former Redfield Riflescope Site, Denver, Colorado.* Ms. Gabriele developed and maintained the Quality Assurance Project Plan and acts as Quality Assurance / Quality Control Manager for this multi-million-dollar, multi-phase project. Additionally, she developed the data management procedures for this unprecedented indoor air testing program with rush analytical and reporting requirements.

Site Investigation and Remedial Actions, *Former DuBois Chemical Facility, East Rutherford, New Jersey.* Ms. Gabriele is directing a multimillion-dollar, multimedia environmental remediation project for the former owner/operator of this operating facility in the Meadowlands in accordance with an administrative consent order with the New Jersey Department of Environmental Protection in connection with an Industrial Site Recovery Act case. Management of this project requires interaction with client, client counsel, site owner/operator, and regulators.

Among other things, the project involves contaminated historic fill materials, chlorinated volatile organic compound (VOC) contaminated groundwater, and monitoring for vapor intrusion, the latter of which is complicated by current site operations.

Site Investigation and Remedial Actions, *Stratus Redtail Ranch, Erie, Colorado.* Ms. Gabriele was responsible for tracking scope, schedule, and budget, for an emergency drum removal project in northern Colorado. The drum removal was completed under an Order on Consent with U.S. Environmental Protection Agency. Through the course of the project over 1,000 drums were removed.

Site Characterization and Restoration, *Former Phosphate Mine and Processing Plant, Leefe, Wyoming.* Ms. Gabriele managed a site characterization and restoration effort following a transformer oil release from multiple unlabeled, stockpiled transformers that had been tipped over by vandals trespassing on the closed mine and processing site. Components of this project included characterization of the transformer oil release area, site restoration design, contractor solicitation and evaluation, contractor oversight, and regulatory reporting. Site restoration included not only the area where transformers had been vandalized, but two other remote locations where transformers had been left on site.

Environmental Site Assessment and Voluntary Cleanup Program Participation, *Multiple RiNo Neighborhood Properties, Denver, Colorado.* Ms. Gabriele advised the owner of properties in Denver's RiNo neighborhood as they transitioned an industrial building into an indoor climbing facility. Earlier components of the project that Ms. Gabriele also managed included a limited Phase II ESA and preparation of a No Action Determination application to the Colorado Department of Public Health and Environment (CDPHE) under its Voluntary Cleanup and Redevelopment Program. The industrial building property was historically occupied by residential homes, a feed store, a coal yard, and a warehouse. Redevelopment of the property involved excavation of contaminated fill materials and short-term exposure to contaminated groundwater.

Environmental Site Assessment and Remedial Action, *Shopping Center, Colorado Springs, Colorado.* Ms. Gabriele managed a focused Phase II ESA and remediation of a former dry cleaner unit where VOCs were detected in sub-lab soil vapors. Ms. Gabriele met with CDPHE to discuss the Phase II ESA findings and proposed the next steps. Geosyntec designed, installed, and operated an SVE system at the unit. Geosyntec helped the client secure a No Further Action determination from CDPHE once soil vapor treatment was complete.

Environmental Site Assessment, *Shopping Center, Albuquerque, New Mexico.* Ms. Gabriele designed and managed a limited Phase II ESA of a former drycleaner site for the property owners

where sub-slab vapors and soil vapors were screened for the presence of VOCs prior to sampling. With the results of the cost-effective Phase II ESA in-hand, the client was able to sell the property.

Site Investigation and Remedial Actions, *Former M&P Compounding Facility, Asbury Park, New Jersey.* On behalf of the responsible party, Cookson Group, plc, Ms. Gabriele managed a multi-million-dollar, multi-media environmental investigation and remediation project under New Jersey's Environmental Cleanup Responsibility Act. The project involved underground storage tank, sump and floor drain closures; soil remediation; evaluation of the vapor intrusion pathway; and monitored natural attenuation of groundwater contamination.

Environmental Site Assessment, *Gates Rubber Company Complex, Denver, Colorado.* Ms. Gabriele managed comprehensive Phase I ESA, Phase II soil and groundwater investigations, and UST closures and soil remediation efforts at this former automotive tire, belt, and hose manufacturing complex as part of brownfields redevelopment of the facility. The Phase I ESA included evaluations of historic operations, demolished facilities and existing buildings to define potential environmental conditions and recommendations for future site development.

Underground and Aboveground Storage Tank Closures, Site Characterization, and Corrective Action, *multiple sites in Colorado.* Ms. Gabriele has managed UST and AST projects that included closure, site characterization and corrective action due to historic releases from the tanks.

Quality Assurance, *Asarco Globe Plant Site, Denver, Colorado.* Ms. Gabriele served as the Quality Assurance Manager during the remedial investigation and design phases of a multimillion-dollar multi-media cleanup program at the Asarco Globe Plant CERCLA site. Ms. Gabriele also served as Construction Quality Assurance Manager during remedy implementation and managed the operations, maintenance and monitoring tasks after remedy implementation. The project included investigation of soil, groundwater, surface water, sediment, and ambient air impacts due to releases of arsenic, cadmium, lead, and zinc and remedial design and implementation of over 600 residential and commercial properties, using excavation and replacement, capping, and deep tilling remedies as appropriate. Other remedial actions included the design of a slurry wall and RCRA cap around a tailings pile; cleanup of a 1,000-foot-long drainage ditch and restoration of wetlands; and controls for wet operations and point source emissions.

Data Usability Summary Reports, *multiple sites in New York.* Ms. Gabriele has directed multiple projects for multiple clients requiring data usability summary reports (DUSRs) for their environmental data.

EHS Management Systems

Environmental Management System Support, *City and County of Denver, Colorado.* Ms. Gabriele is directing work under a contract with the City to serve as its on-call EMS consultant. Under this

contract, Geosyntec has evaluated the current EMS scope and context, and obligations related to leadership commitment and made recommendations to the City for improved EMS performance. Geosyntec also conducted an internal audit of the system; revised the process for conducting internal audits; and designed and facilitated a training event on the internal audit process. Recently, Geosyntec evaluated and made recommendations for improvements to the organization's management review process.

Environmental Management System Development and Implementation*, City of Westminster, Colorado.* Ms. Gabriele directs this project with the City whose objective is to ultimately implement a full-scale EMS across all City-owned and operated buildings (30+) and departments (12). The initial phase was a gap assessment of the City's existing systems and processes to the ISO 14001 Standard. The second phase was the development of an EMS for the entire City with training to the General Services team and three select divisions: water treatment, fleet management, and golf courses. The third phase was implementation of the system for the General Services team and the three select divisions. Currently, Geosyntec is supporting the City with tools it developed for the City to track EMS obligations and manage EMS documents and records.

Compliance Management System Maintenance and Updates, *Arch Resources Coal Mining, Processing and Loading Facilities in the United States.* Ms. Gabriele works with Arch Resources, Inc. (formerly Arch Coal) to maintain and improve its Environmental Management System (EMS), originally branded as a Compliance Management System (CMS) implemented by Arch in 2009. Project components include EMS strategic planning, document maintenance and management, training materials development, auditing, and corrective action planning to support continual improvement of the system. In addition, Geosyntec is supporting Arch in its pursuit of certifications to the Toward Sustainable Mining (TSM) Standard for a portion of its mines. To this end, Ms. Gabriele directed a water balance project for all of Arch's mine locations and worked with Arch to broaden the scope of CMS to include all environmental aspects covered under the TSM Standard.

Environmental Management System Training, *Corning Incorporated, Painted Post, NY.* Ms. Gabriele directed this project and served as technical lead where Geosyntec trained Corning personnel to conduct internal EMS audits. Corning's facility is ISO 14001 certified.

Environmental Management System Development, *Greenberg Traurig LLP, Multiple Locations Worldwide.* Ms. Gabriele developed an EMS Manual for this multi-disciplinary law firm intending to pursue ISO14001 certification.

Environmental Management System Development, *Trident Seafoods Corporation, Washington and Alaska.* Ms. Gabriele advised this organization on updates to its EMS Manual in response to a

requirement of an Order on Consent with the Alaska Department of Environmental Conservation. The EMS needed to conform to the compliance-focused EMS Standard published by the U.S. EPA.

***Workforce Compliance Assessment**, Washington Gas & Light, Washington, DC and surrounding states.* Ms. Gabriele supported this project as management system subject matter expert. Geosyntec completed an assessment of the utility's environmental department workforce that included document review, interviews with key stakeholders, and a benchmark against peer organizations. Our deliverable included a roadmap for development and implementation of an environmental management system.

***Environmental Management System Development**, Confidential Electrical Utility, Multiple U.S. Locations.* Ms. Gabriele directed this project with an electrical utility provider with over 50 generating stations. The initial phase of this project was a gap assessment of the organization's existing systems and processes to a traditional plan-do-check-act management system. The second phase was the development of a compliance-focused EMS for the organization to adapt.

***Environmental Management System Development**, Confidential Healthcare Provider, Multiple U.S. Locations.* Ms. Gabriele managed this project relative to select U.S. divisions of this multinational organization. The initial phase of this project was a gap assessment of the organization's existing systems and processes to the ISO 14001 Standard. The second phase was development of a compliance-focused EMS for the select U.S. divisions. The final phase was comprehensive training on the system and the environmental compliance programs developed under the system.

***Integrated Management System Alignment**, Cheniere Energy, Inc., headquartered in Houston, Texas.* Ms. Gabriele directed this project with the largest producer of liquified natural gas (LNG) in the U.S. and the second largest LNG operator in the world whose objective it is to move toward a single management system model across all functions of the organization. Geosyntec was retained to work with the corporate Operational Excellence, Health & Safety (H&S), Environmental, and Engineering & Construction (E&C) teams to advance this initiative. The scope of services was to map the management system elements and key processes across functions, and assess and evaluate each function's needs, gaps, and/or duplications relative to the management system. The Geosyntec team was able to identify several opportunities for improvements to the system.

***Environmental Management System Development, Implementation and Maintenance,** Food and Beverage Industry Complex, United States Territory.* After having completed a gap analysis of existing management system components, Ms. Gabriele advised a confidential client on negotiations toward a Consent Decree with the U.S. EPA and development of a compliance-focused EMS required by the Consent Decree. Ms. Gabriele worked with this client to develop an EMS

including a manual, management system procedures, and associated forms and training materials. She worked with the facility's management team on standard operating procedures, work instructions, forms, and training materials for activities associated with environmental compliance obligations to integrate those into the EMS. Ms. Gabriele continued to advise the client through EMS implementation, internal EMS auditing, third-party EMS auditing, and response to third-party audit findings. The EPA unconditionally accepted the third-party audit report and the client's response. Ms. Gabriele continued to monitor EMS implementation for this facility by participating in goal setting exercises and management review meetings and reviewing system performance data and monitoring reports. She also advised the client's corporate team on the use of commercial management system software and worked with the facility on software integration.

Sustainable Engineering Services for Water Programs*, Los Angeles County Metropolitan Transportation District.* Ms. Gabriele served as the Quality Assurance Manager for this indefinite delivery / indefinite quantity contract with Metro. Among other things, Geosyntec is working with Metro to systematically implement programs to reduce water use and improve wastewater and stormwater quality.

EHS and Compliance Management System Training*, Confidential Upstream O&G Company, Colorado.* Ms. Gabriele developed eight hours of training materials to encompass this organization's integrated EHS and compliance management system programs based on the ISO 14001:2015 Environmental management systems -- Requirements with guidance for use; and ISO 45001:2018 Occupational health and safety management system -- Requirements with guidance for use and conducted training for the organization's staff over two 4-hour sessions. Geosyntec provided the training materials for the client after the training for it to use to train new and provide refresher training to existing staff. There was also a module with training materials to use for top leadership, operations teams, and others in an Overview Presentation.

Environmental Management System Gap Analysis*, ENSTOR, East Cheyenne Gas Storage, Peetz, Colorado.* Ms. Gabriele managed Geosyntec's effort to identify gaps to the ISO 14001 Environmental management systems -- Requirements with guidance for use in ENSTOR's EMS at its East Cheyenne facility. The final product was a spreadsheet for ENSTOR to use as an Action Plan.

Environmental Health and Safety Management System Development and Implementation Support*, Terumo BCT, headquarters in Lakewood, Colorado.* Ms. Gabriele directed this project with a manufacturer of blood collection and processing equipment and supplies who needed to be ISO 14001 and 45001 certified to maintain a key customer contract. Geosyntec was retained to work with the corporate and Lakewood, Colorado facility teams to ready the organization for ISO certification audits. The scope of services: conducting an EHS management system (MS) gap

assessment; conducting an internal EHS MS audit to the ISO Standards, conducting an evaluation of EHS compliance at the Lakewood facility and assisting in establishing a risk-based schedule for future compliance evaluations; assisting with employee training and internal engagement; preparing for the internal and third-party audits; and attending the internal and third-party audits in support of the team. Ms. Gabriele was able to secure a successful outcome for the client (i.e., ISO certification) in a relatively short (i.e., four month) timeframe.

Environmental Management System Development, *Multiple Coal Mining, Processing and Loading Facilities in the United States.* Ms. Gabriele advised Southern Coal Corporation (SCC) on negotiations toward a Consent Decree and is advising SCC on development and implementation of a compliance-focused EMS and compliance database that are required by the Consent Decree. Ms. Gabriele worked with SCC to develop an Environmental Policy, EMS Manual, and supporting management system procedures and associated templates. Ms. Gabriele developed and facilitated a webinar series to train SCC managers and support personnel on its EMS and managed the development and population of a compliance database.

Environmental Management System Development, *Multiple Coal Mining, Alpha Natural Resources Coal Processing and Loading Facilities in the United States.* After having completed a gap analysis of existing management system components across its entire organization of over 100 mine sites, Ms. Gabriele assisted Alpha Natural Resources with development and implementation of a compliance-focused EMS to improve environmental management and environmental performance and to satisfy requirements of a Consent Decree. Ms. Gabriele worked with Alpha to develop its EMS Manual and the supporting management system procedures and associated templates. Ms. Gabriele developed and facilitated a series of webinars to train Alpha managers and support personnel on its EMS.

Environmental Management System Audits, *Musashi Auto Parts, Battle Creek, Michigan.* Ms. Gabriele managed and currently directs internal audits of this facility's EMS and environmental compliance obligations. Musashi's EMS is ISO 14001 certified.

Environmental Health & Safety Management System Audit, *Ferrara Candy Company, Itasca, Illinois.* Ms. Gabriele managed an internal audit of this facility's EHS MS. Ferrara's EHS MS is ISO 14001 and 45001 certified.

Environmental Management System Support, *Cripple Creek & Victor Gold Mining Company, Victor, Colorado.* Ms. Gabriele assisted the Cripple Creek & Victor Gold Mining Company (CC&V) environmental staff in a review and reorganization effort of its EMS documents in 2014 in advance of its EMS audit. CC&V's EMS is ISO 14001 certified.

EO100™ Audit, *Seneca Resources Company, LLC (Seneca Resources), Multiple Upstream Natural Gas Facilities in Pennsylvania.* Ms. Gabriele led a verification assessment (audit) of this organization's Pennsylvania operations to the EO100™ Standard for Responsible Energy Development (2017) and the EO100™ Standard Addendum for Shale Oil and Gas Operations (2015). The audit team included subject matter experts representing each of the five Principles: Corporate Governance, Transparency & Ethics; Human Rights, Social Impact & Community Development; Indigenous People's Rights; Fair Labor & Working Conditions; and Climate Change, Biodiversity & Environment. The audit entailed review of documentation provided by the organization, interviews with both internal and external stakeholders, and visits to more than 50 of the organization's facilities. In 2023, Ms. Gabriele completed senior review on portions of the surveillance audit.

MiQ Certification Assessment, *Seneca Resources, Multiple Upstream Natural Gas Facilities in Pennsylvania.* Ms. Gabriele led a certification assessment (audit) of this organization's Pennsylvania operations to the MiQ Standard. The Standard outlines a list of mandatory company practices that an operator must have in place to be eligible for MiQ Certification and requires operators to deploy monitoring technology to detect unintended methane emissions for timely repair or replacement. The audit entailed review of documentation and data provided by the organization, interviews with Seneca personnel, and visits to several of the organization's facilities. Ms. Gabriele has since directed re-certification of the operations to the Standard.

EHS Planning and Compliance Assurance

RCRA Compliance Audit, *Confidential Client, Colorado.* Through outside counsel, Geosyntec was retained to conduct a comprehensive RCRA compliance audit of hazardous waste transporter's operations in Colorado. Ms. Gabriele led the audit that included a review of the operation's records, interviews with key personnel, and observations of conditions and activities associated with the operations. The findings will be used to improve the organization's RCRA program.

Desktop RCRA Compliance Audit, *Confidential Client, Confidential Locations.* Through outside counsel, Ms. Gabriele led a confidential desktop RCRA compliance audit of two of this organization's mining operations. The audit team reviewed the mines' records and interviewed key personnel. The findings were used to improve the organization's RCRA programs.

Comprehensive EHS Compliance Audit, *Confidential Client, Colorado.* Through outside counsel, Ms. Gabriele led a comprehensive EHS compliance audit of this organization's manufacturing operation in Colorado. The audit team reviewed the operation's records, interviewed key

personnel, and observed conditions and activities at the operation. The findings will be used to improve the organization's EHS programs.

RCRA Compliance Support, *Confidential Client, Colorado.* Through outside counsel, Geosyntec was retained to conduct a comprehensive RCRA audit of the facility operations. Ms. Gabriele led the audit and efforts to address compliance exceptions identified during a hazardous waste inspection performed by the regulatory authority as well as those identified during Geosyntec's audit. Geosyntec's work included preparing a response to the regulator's comments, recording waste determinations, developing a hazardous waste management program, emergency action plan, and training program, providing the training to facility personnel, and attending a compliance advisory meeting with the client and regulator.

Solid Waste Compliance Support, *Confidential Client, Colorado.* Through outside counsel, Geosyntec was retained to assess the compliance status of a facility managing solid waste in surface impoundments. Ms. Gabriele managed the project which led to updating the facilities Engineering Design and Operations Plan for the impoundments and relining two of the impoundments. Geosyntec served as construction quality assurance manager and engineer during the relining process.

Waste Compliance Audit, *Confidential Client, Mississippi.* The legal department for this pharmaceutical company engaged Geosyntec to conduct a comprehensive waste management audit at its facility in Mississippi. Ms. Gabriele and others participated in the three-day audit. Findings from the audit fell into the following categories: waste determination; satellite accumulation; solvent-contaminated wipes; central accumulation area; inspections; universal waste; electronic wastes; used oil; biennial reporting; solid waste management; spill waste management; and other related waste topics.

Environmental Compliance Audit, *Confidential Client, Nebraska, Colorado, and Iliinois.* The legal department of this client engaged Geosyntec to conduct comprehensive environmental compliance audits of hazardous waste transporters it has been using. Ms. Gabriele led the audits which the client will use to manage business risks.

EHS Compliance Support, *Core Natural Resources (formerly Arch Resources) Coal Mining, Processing and Loading Facilities in the United States.* Ms. Gabriele directs Geosyntec work for Core's Environmental and Safety Departments. The work includes a variety of matters to assure compliance including training of its environmental staff, auditing of Core operations as well as the operations of vendors critical to compliance, and U.S. EPA Toxics Release Inventory (TRI) and Greenhouse Gas (GHG) reporting. In addition, Geosyntec supports Core with upkeep and development of its environmental and ESG information management software platforms, safety data sheets, scope 1, 2, and 3 GHG emissions inventory, and product carbon footprint (PCF).

EHS Program Development, *Charm Industrial, Colorado, California, and Kansas operations*. Ms. Gabriele directed projects with this biomass processor to develop EHS programs including air permitting and compliance, stormwater management, spill prevention, hazardous materials and waste management, industrial hygiene, and radiation safety. Charm generates bio-oil from biomass that is deep-well injected for carbon sequestration.

PSM / RMP Compliance Matter, *Confidential Client, Confidential U.S. Locations.* Ms. Gabriele is managing Geosyntec's efforts to build a Process Safety Management and Risk Management Plan program for flammable gas transloading operations across the U.S. Until recently, the organization was unaware of PSM / RMP applicability relative to its operations and had not been maintaining documented process safety information, process hazard assessments, standard operating procedures, safe work practices, pre-startup safety reviews, mechanical integrity programs, management of change programs, or compliance audits. Geosyntec's work involves development of and training on these programs.

EHS Program Development, *MediWaste Disposal, Arizona and Nevada*. Ms. Gabriele directed this project where Geosyntec advised its client on strategies for citing a medical waste treatment facility using pyrolysis. The client originally intended to establish a facility in Arizona but transitioned its attention to Nevada. Geosyntec worked on air permitting, sustainability permitting, conditional use permitting, and overall compliance support.

Environmental Feasibility Assessment, *Cheyenne Board of Public Utilities, Wyoming.* Ms. Gabriele directed Geosyntec's work for the client in assessing the feasibility of converting three of its freshwater reservoirs to recycled water reservoirs. The work included an initial assessment of the impacts to human health and environment.

Air Compliance Support, *BlueTriton Brands, Colorado.* Ms. Gabriele directed Geosyntec's work for the client in preparing the Air Pollutant Emission Notice (APEN) renewals. The work included an assessment of the facility for changes since the last APEN filing.

RCRA Compliance Matter, *Confidential Client, Confidential U.S. Location.* Ms. Gabriele and others were retained to provide an independent third-party review to the client at it considered investing in a major capital project at one of its U.S. facilities. Of particular interest to the client were federal and state regulations that would delay the startup of the process due to permitting requirements or making the process cost prohibitive due to required controls or regulatory limitations. The client asked Geosyntec to conduct an environmental review and applicability analysis of the process with a particular focus on the federal RCRA regulations.

RCRA Compliance Audit, *Confidential Client, Confidential Location.* Through outside counsel, Ms. Gabriele led a confidential RCRA audit of this organization's mining operations at a remote

location. The audit team included a review of mine's records, interviews with key personnel, and on-site observations of conditions and activities. The findings were used to improve the organization's RCRA program.

Environmental Compliance Support*, Dragon ESP, Colorado and Wyoming.* Ms. Gabriele directs projects where Geosyntec supports this trailer manufacturing operation with air emissions, stormwater, and hazardous materials compliance programs.

Environmental Compliance Support*, Hunter Douglas Window Fashions, Colorado.* Ms. Gabriele directs this project where Geosyntec supports this window fashions manufacturing operation with air emissions, stormwater, and hazardous materials compliance programs.

Environmental Compliance Support*, Mutoh America, Arizona.* Ms. Gabriele directs this project where Geosyntec supports this printer ink importer with TSCA compliance.

Environmental Compliance Program Development, *Confidential Client, Confidential Location*. Ms. Gabriele developed program materials for this seafood processor that included RCRA (waste and used oil processing), CAA (operating permits, RICE MACT, and ammonia and butane general duty clause), CWA (individual NPDES permit, multi-sector general industrial stormwater discharge permit, and SPCC rules), EPCRA Tier I and II and TRI reporting, and local pesticide compliance programs.

Hazardous Waste Compliance Program Development, *Confidential Client, Confidential Location*. Through outside counsel, Ms. Gabriele directed this project where a hemp processing facility needed to improve its hazardous waste compliance program in response to an agency inspection.

Environmental Compliance Auditing Program, *Confidential Client, Multiple U.S. Locations*. Through outside counsel, Ms. Gabriele was the program manager for Geosyntec's work with this O&G industry client to develop internal audit checklists for dozens of facilities spanning four states. The client intends to use the checklists to implement an internal audit program across its entire operation.

Multi-media Environmental Compliance Auditing Program, *Confidential Client, Multiple North American Locations*. Through outside counsel, Ms. Gabriele served as program manager for Geosyntec's work with this specialty chemical client to audit environmental compliance at as many as twelve of its facilities per year.

Multi-media Environmental Compliance Auditing Program, *Confidential Client, Multiple U.S. Locations.* Through outside counsel, Ms. Gabriele directed an audit of this company's operations. It had never considered EPCRA or TSCA applicability and imports and distributes products with

hazardous ingredients. Among other things, the company was required to submit TSCA Chemical Data Reports (CDRs) the current and prior reporting periods and may have been required to EPCRA Tier I and II reports. Ms. Gabriele supported the client with self-disclosure of violations to EPA and with corrective actions including development of an environmental compliance and training program.

Multi-media Environmental Compliance Audit, *Confidential Client, Colorado.* Ms. Gabriele managed the audit of this home furnishing assembly company's operations. The company is subject to CAA, CWA, RCRA, and EPCRA rules. Audit findings were used to make corrections and improvements to the company's environmental compliance programs.

Multi-media Environmental Compliance Audit, *Confidential Client, Colorado.* Through outside counsel, Ms. Gabriele managed the audit of this company's hard rock mining operation. The company is subject to CAA, CWA, RCRA, and EPCRA rules. Audit findings were used to make corrections and improvements to the company's environmental compliance programs.

Multi-media Environmental Compliance Audit, *Confidential Client, Confidential Location*. Ms. Gabriele managed multi-media environmental compliance audits of this food processing facility that included RCRA (waste and used oil processing), CAA (operating permits, RICE MACT, and ammonia and butane general duty clause), CWA (individual NPDES permit, multi-sector general industrial stormwater discharge permit, and SPCC rules), EPCRA Tier I and II and TRI, and local pesticide compliance programs.

Environmental Program Review Checklists, *Confidential Utility Provider, Multiple Facilities*. Ms. Gabriele managed the preparation of environmental program review checklists for the utility company's Compliance Assurance group to use when evaluating compliance and training staff at its generation stations and customer service centers. Programs included CAA, CWA, SPCC, RCRA, EPCRA, Dam Safety, DOT, and NRC.

Environmental Compliance Audits, *Confidential Client, Multiple Colorado facilities*. Ms. Gabriele conducted limited environmental compliance audits and prepared Operations and Compliance Memoranda for three facilities in Colorado. The facilities were occupied by an electrical generator manufacturing plant, a diesel engine rebuild plant, and a field service support operation.

Environmental Compliance Audits, *Musashi Auto Parts, Battle Creek, Michigan.* Ms. Gabriele managed internal audits of this facility's environmental compliance obligations.

Process Hazard Analysis Study, *Vopak Terminal Los Angeles, Inc., California.* Ms. Gabriele provided senior oversight of Geosyntec's PHA team. The team led the PHA using the what-if analysis method and completed a human factors checklist for modification to accommodate

conversion from fuel oil to jet fuel at its bulk terminal. The PHA resulted in the identification of concerns associated with the modifications and specific recommendations to address the concerns.

Process Hazard Analysis Review, *Food and Beverage Industry Complex, United States Territory.* Ms. Gabriele provided senior oversight of Geosyntec's PHA team. The team led a review of a PHA completed for an ammonia refrigeration system five years prior. The PHA focused on concerns and recommendations identified during the initial PHA. The PHA used the what-if analysis method. A human factors checklist was also completed. The PHA resulted in the identification of concerns associated with operation and maintenance of the system and specific recommendations to address the concerns.

Compliance Review*, Umicore, North American Operations.* Ms. Gabriele directed this project where Geosyntec assessed this global materials technology and recycling organization's programs for compliance with the U.S. TSCA rules and Canadian Environmental Protection Act (CEPA) Prohibition of Certain Toxic Substances Regulations.

Environmental Management Plans, *Former Redfield Riflescope Site, Denver, Colorado.* Ms. Gabriele prepared RCRA Contingency Plans, Hazardous Materials Management Plans, training programs, and Biennial Reports for this multi-million-dollar, multi-phase project. This ongoing project involves extensive groundwater, soil, and indoor air investigations as part of RCRA site characterization activities including over 8,000 indoor air tests, installation and sampling of over 100 monitoring wells, and collection of scores of soil and soil vapor samples.

RCRA Part B Permit Renewal, *Union Pacific Railroad Laramie Tie Plant, Laramie, Wyoming* – Ms. Gabriele managed Geosyntec's work as technical advisors to Wyoming Department of Environmental Quality as the permittee sought to renew and operate under its permit. Permit renewal coincided with a 20-year long pilot study of phytoremediation as an alternative to a RCRA cap on a corrective action management unit (CAMU).

RCRA Current Conditions Report, *Nammo Defense Systems, Mesa, Arizona*. Ms. Gabriele is the senior technical advisor on Geosyntec's team to prepare this report for the client's campus. The report is a requirement of an Administrative Order on Consent lodged in 2021 and will provide an update to the most recent inventory of Solid Waste Management Units and Areas of Concern. It is anticipated that almost 100 SWMUs and AOCs will be reported on.

SARA Toxic Release Inventory (TRI) Reporting, *Confidential Client, Alaska.* Ms. Gabriele managed the evaluation of SARA TRI reporting records for this seafood processor in response to a U.S. EPA Request for Information. Records associated with three facilities were evaluated for the current and prior four years.

SARA TRI Reporting, *Confidential Client, Multiple U.S. Locations.* Ms. Gabriele managed the evaluation and preparation of SARA TRI Form R reports for this solid waste management company that had never considered TRI applicability. Two of ten facilities evaluated were required to file TRI reports for the current and prior years. Ms. Gabriele supported the client with self-disclosure of violations to EPA and with corrective actions.

Consent Decree Negotiations, *Asarco, Inc., Denver, Colorado.* Ms. Gabriele assisted Asarco with negotiation of a Consent Decree and Statement of Work to settle a lawsuit filed by the State of Colorado for damages to natural resources under CERCLA.

Corporate Compliance Evaluation Program*, Confidential Client, Multiple Confidential Locations.* Ms. Gabriele reviewed RCRA Part B permits and provided high-level summary information on compliance obligations to the client's corporate team.

Corporate Storm Water Compliance Program*, approximately 50 facilities throughout the United States.* Ms. Gabriele managed development and implementation of a corporate program to assist Cookson America, Inc.'s subsidiaries with regulatory compliance associated with storm water discharges from industrial activities.

Storm Water Management Plan, *West Elk Mine, Somerset, Colorado.* Ms. Gabriele developed a storm water management plan for an underground coal mining operation.

Storm Water Best Management Practices, *Colorado Springs Utilities, multiple Colorado facilities.* Ms. Gabriele prepared a storm water best management practices manual for the utility's field crews.

SPCC Plan, *Schlage Lock Facility, Colorado Springs, Colorado.* Ms. Gabriele directed a project to review and update this manufacturing facility's SPCC Plan.

SARA TRI Reporting, *Anzon, Inc., Laredo, Texas.* Ms. Gabriele managed the preparation of SARA TRI Form R reports for this antimony refining facility.

PROFESSIONAL EXPERIENCE

Geosyntec Consultants, Inc., Greenwood Village, CO, 2012 - present

EnviroGroup Limited, Centennial, CO, 1992 – 2012

Clayton Environmental Consultants, Inc., Edison, NJ, 1989-1992

Phoenix Safety Associates, Ltd, New York, NY, 1988-1989

AFFILIATIONS

Colorado Environmental Management Society; Board President

Rocky Mountain Association of Environmental Professionals

REPRESENTATIVE PUBLICATIONS AND SPEAKING ENGAGEMENTS

Invited speaker: RCRA Regulations: Tips to Minimize Waste and Save Money, Air and Waste Management Association Midwest Section Environmental Technical Conference, May 2024

Invited panelist: Environmental, Social, and Governance: The community's role in effective ESG systems – Putting the "social" in ESG. Environmental, Health and Safety Webinar, Greenberg Traurig, May 2023.

Invited panelist: Toxics Release Inventory: The Basics of Reporting. Business and the Environment Conference, Northwest Environmental Business Council, December 2022.

S. Gabriele and B. McLaughlin, 2022. Greenhouse Gas Inventory Workshop, presented virtually through the Colorado Green Business Network, April 2022.

S. Gabriele and L. A. Sigler, 2000. Community Relations Issues related to Residential Site Investigations and Cleanups, presented Hazardous Waste Research Conference, Denver, May 2000.