

VOLUNTARY CLEANUP PROGRAM APPLICATION

**Former Kilmer Landfill – Proposed Storage Development
6800 Kilmer Street
Arvada, Jefferson County, Colorado**

January 20, 2022

Terracon Project No. 25217269



Prepared for:

Carlson Associates, Inc.
Eastlake, Colorado

Prepared by:

Terracon Consultants, Inc.
Wheat Ridge, Colorado

terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials

January 20, 2022



Colorado Department of Public Health and Environment
HMWMD-RP-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
Attention: Mr. Fonda Apostolopoulos

Re: Voluntary Cleanup Program Application
Former Kilmer Landfill – Proposed Storage Development
6800 Kilmer Street
Arvada, Jefferson County, Colorado 80007
Terracon No. 25217269

Dear Mr. Apostolopoulos:

Please find enclosed the Voluntary Cleanup Program (VCP) Application for your review regarding the above-referenced property, the property owner's authorization to submit the Application, and a check for the \$2,000 review fee.

Should you have any questions or require additional information, please do not hesitate to contact us at (303) 423-3300. We look forward to your comments and/or approval of this Application.

Sincerely,
Terracon Consultants, Inc.

Jeffrey D. Attig
Project Manager

Mark White, P.G.
Department Manager

Attachments: Electronic copy on compact disk
CC'd: Brad Penwell (Carlson Associates, Inc.)



Terracon Consultants, Inc. 10625 W. I-70 Frontage Rd N, Ste 3 Wheat Ridge, Colorado 80033
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EXECUTIVE SUMMARY
VOLUNTARY CLEANUP PROGRAM APPLICATION
FORMER KILMER LANDFILL – PROPOSED STORAGE DEVELOPMENT
6800 KILMER STREET
ARVADA, JEFFERSON COUNTY, COLORADO 80007

January 20, 2022

Terracon Project No. 25217269

On behalf of Carlson Associate, Inc., Terracon Consultants, Inc. (Terracon) has prepared this Voluntary Cleanup Plan (VCP) Application for future development located at 6800 Kilmer Street, Arvada, Colorado (Site). This Application is being submitted in general accordance with the Voluntary Clean-up and Redevelopment Act, Title 25, Article 16, Part 3 Colorado Revised Statutes (25-16-301 et seq., CRS).

EXECUTIVE SUMMARY

The site consists of approximately 13.66 acres of land located at 6800 Kilmer Street in Arvada, Colorado, corresponding to Jefferson County Parcel No. 30-011-00-018. The site currently consists of vegetated vacant land that was historically the site of unpermitted landfilling activities. Ralston Creek meanders long the northern site boundary. Croke Canal runs along the western and southern property boundaries. The proposed construction consists of surface parking for RVs, a small office building, and a 22,035 square foot stormwater detention pond in the northeastern corner of the property. A Topographic Map showing the site location is included as Exhibit 1. A site diagram showing the proposed development overlay and limited soil boring and soil sampling locations is included as Exhibit 2. A site diagram showing the proposed development overlay and groundwater sampling locations is included as Exhibit 3. Soil vapor sampling locations shown on Exhibit 4 and the proposed redevelopment of the site is depicted on Exhibit 5. Note that the above-ground configuration may be revised but the proposed development shown is the current iteration.

The scope of services provided by Terracon and other consultants to date include the following:

- Limited Site Investigation (Terracon, July 2007);
- Geotechnical Engineering Report (Terracon, July 2007);
- Limited Site Investigation (Terracon, October 2017);
- Phase I ESA (Terracon, June 2021)
- Limited Site Investigation (Terracon, November 2021);

Based on historical information obtained from the previous environmental assessments conducted at the site, the site consisted of open land that was disturbed in the late 1930s, and utilized as an unpermitted solid waste landfill from approximately 1939 to 1942, after which the site remained vacant land. Since 1983, the site has remained in its current configuration and condition. The site currently exists as vegetated vacant land.

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Previous Phase I ESAs conducted at the site identified the following recognized environmental conditions (RECs), controlled RECs (CRECs), and historical RECs (HRECs):

- Historical use of the site as a landfill and the documented impact to groundwater and soil gas at the site.

Previous subsurface assessments identified that the general lithology consists of shallow silty sands and silts overlying landfill materials as deep as 17 feet below ground surface (bgs). Silts, sands, and gravels were encountered below the landfill materials. Claystone is encountered at 26 to 28.5 feet below ground surface and extends to at least 35 feet bgs, which corresponds to the deepest point of investigation.

Groundwater was encountered at the site at depths ranging from approximately 6 to 14 feet bgs over the time period encompassing the various site investigations. The regional groundwater flow direction is estimated to flow to the northeast. It should be noted that seasonal groundwater elevations will likely be affected by Croke Canal and Ralston Creek.

Contaminants of concern (COCs) have been identified during previous site investigations, likely associated with the onsite landfill material. Historical concentrations were compared to both historical and current applicable standards. COCs detected in soil, groundwater, and soil gas are summarized below:

- COCs in soil include arsenic, which was reported above Environmental Protection Agency (EPA) Residential and Industrial Regional Screening Levels (RSLs) (0.68 milligrams per kilogram (mg/kg) and 3.0 mg/kg, respectively), and the Colorado background concentration of 11 mg/kg. The maximum reported arsenic concentration in soil was 26 mg/kg in soil boring B-4.
- COCs in groundwater include benzene, arsenic, and selenium. Benzene was detected slightly above the human health-based Colorado Groundwater Quality Standard (CGWQS) of 5 micrograms per liter (ug/L) in one groundwater sample collected at the site during the 2007 LSI (from boring B-3), however, a replicate groundwater sample collected during the 2021 LSI from approximately the same location did not contain a benzene groundwater concentration above laboratory reporting limits (non-detect). Dissolved Resource Conservation and Recovery Act (RCRA) metals arsenic and selenium were also reported above CGWQS during the 2007 LSI in soil borings B-3 and B-6.
- COCs in soil gas include a number of VOCs detected across the site in the soil gas samples during the 2017 LSI. The following VOCs in soil gas were detected at concentrations that represent a vapor intrusion concern for residential/industrial/commercial property use: benzene, chloroform, 1,4-

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dichlorobenzene, ethylbenzene, naphthalene, trichloroethylene, and vinyl chloride. In addition, carbon tetrachloride, dichlorodifluoromethane, and tetrachloroethylene concentrations represented a vapor intrusion concern for residential but not commercial/industrial use.

- Methane was evaluated against its Lower Explosive Limit (LEL), which is 50,000 parts per million by volume (ppmv). Laboratory methane detections ranged from 1,790 ppmv to 10,900 ppmv. Methane concentrations exceeded 10% of the LEL or 5,000 ppmv for methane at SVP-01, SVP-03, SVP-05, and SVP-07. The laboratory analysis of methane indicates a potential combustion risk at the site.

The following exposure pathways are considered to be complete or potentially could be completed during construction (refer to Tables 1-4 for a comparison of soil, groundwater, and soil gas concentrations to exposure-specific screening levels for industrial/composite worker exposure scenarios):

- Industrial Soil Dermal Contact (Soil _{I-Derm});
- Industrial Soil Ingestion (Soil _{I-Ing}); and,
- Vapor Intrusion (Soil Gas _{VI})

The proposed Remedial Action Plan (RAP) for the site considers no new changes to the current planned development of the site and includes specific remedial tasks that will be implemented to mitigate and reduce short-term and long-term exposures to site contaminants. The conceptual RAP selected for this site is summarized below.

Excavation activities during redevelopment will be conducted to facilitate construction of the surface storage parking areas, underground utilities, the stormwater detention basin, the storage office building, and light pedestals. Based on Terracon's 2007 and 2017 LSI results and professional experience, it is expected that metals, VOCs, and semi-volatile organic compounds (SVOCs) will be considered likely COCs based on historical knowledge of the impacted landfill material and soils. It's anticipated that landfill material excavated and generated to facilitate development will be sampled, characterized and disposed of as a special waste at a Subtitle D Landfill per the Materials Management Plan (MMP) based on a waste characterization profile created from analytical data for the site.

In the event that Regulated Asbestos-Containing Soil (RACS), as defined in the CDPHE 6 CCR 1007-2 Part 1 – Regulations Pertaining To Solid Waste Sites and Facilities, Section 1.2 Definitions, effective June 30, 2018, are encountered during redevelopment activities, it shall be managed in accordance with the MMP and in compliance with the CDPHE 6 CCR 1007-2 Part 1 – Regulations Pertaining To Solid Waste Sites and Facilities and Section 5.5 (Management of RACS), effective September 30, 2014.

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Regarding the vapor intrusion pathway, detected VOCs and methane in soil gas indicate a potential vapor intrusion and combustion risk. The proposed construction includes one slab-on-grade office building. The proposed RAP includes the installation of an active vapor mitigation system (VMS) beneath the building slab to mitigate vapor intrusion into the building. The VMS will contain LEL and pressure sensors and be tied to a fire control panel in the event that vapors exceed 5 and 10 percent trigger levels. The installation of the vapor mitigation system will be observed and tested under the supervision of a professional engineer licensed in Colorado to document that the membrane and other system infrastructure has been installed per the manufacturer's and design specifications.

Additionally, the RAP proposes establishing a Notice of Environmental Use Restriction to restrict soil disturbance activities and use of onsite groundwater, and require active VMS's be installed beneath site buildings constructed over areas with vapor intrusion concerns.

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Terracon Project No. 25217269

1.0 GENERAL INFORMATION

On behalf of Carlson Associates, Inc, Terracon Consultants, Inc. (Terracon) has prepared this Voluntary Cleanup Plan (VCP) Application for the future development located at 6800 Kilmer Street, Arvada, Colorado (site). This Application is being submitted in general accordance with the Voluntary Clean-up and Redevelopment Act, Title 25, Article 16, Part 3 Colorado Revised Statutes (25-16-301 et seq., CRS). Implementation of the procedures outlined in this document is intended to aid in the protection of public health and the environment during redevelopment activities and following construction completion.

ITEM	DESCRIPTION
Site Address	6800 Kilmer Street Arvada, Jefferson County, Colorado
Site Area	Approximately 13.66 acres
Parcel Number(s)	30-011-00-018
Current Land Use	Vegetated vacant land
Current Zoning	Light Industrial – 40 feet maximum height (IL), per the Arvada Municipal Code, Version November 17, 2021.
Current Ground Cover	Vegetation, soils, gravel
Topography	Very gently sloping towards the northeast
Proposed Construction	The developer plans to redevelop the property to include surface parking, a stormwater detention basin, and a storage office building
Property Owner	Chelton, LLC PO Box 460010 Fort Lauderdale, Florida 33346
Prepared For	Colorado Department of Public Health and Environment (CDPHE) HMWMD-RP-B2 Attn: Mr. Fonda Apostolopoulos 4300 Cherry Creek Drive South Denver, Colorado 80246-1530 (303) 692-3411

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ITEM	DESCRIPTION
Contact Person	Terracon Consultants, Inc. (Terracon) Jeffrey D. Attig 10625 West I-70 Frontage Road North, Suite 3 Wheat Ridge, Colorado 80033 (303) 454-5215

A Topographic Map showing the site location is included as Exhibit 1, a site diagram showing soil sampling locations is included as Exhibit 2, a site diagram showing groundwater sampling locations is included as Exhibit 3, and a site diagram showing soil vapor sampling locations is included as Exhibit 4. The proposed construction consists of surface parking, a stormwater detention basin, and a storage office building, and is shown in Exhibit 5. Note that the above-ground configuration may be revised but the proposed development shown is the current iteration.

Terracon services conducted to date on this property were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time. Terracon makes no warranties, either express or implied, regarding findings, conclusions, or recommendations. Please note that Terracon does not warrant the work of other consultants, laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report. This document was prepared in accordance with the scope of work agreed to by Carlson Associates, Inc., as reflected in our proposal (P25217383).

Any approaches, plans, findings, conclusions, and recommendations presented in this document are based upon information derived from assessment and survey activities conducted by Terracon and other environmental consultants. Such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable, or not present during these services. We cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during previous assessments conducted for the site by Terracon or others. The data, interpretations, approaches, plans, findings, and any recommendations are based solely upon data obtained at the time and within the scope of those services.

2.0 PROGRAM INCLUSION

For VCP eligibility, the following criteria must be met for the above-mentioned property. An answer of “No” to Question 1 or “Yes” to any of Questions 2 through 6 would disqualify this property from the program.

CRITERIA	YES / NO
Is the applicant the owner or the owner’s designated representative of the property?	Yes

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CRITERIA	YES / NO
Is the property listed or proposed for listing on the National Priorities List of Superfund Sites established under the Federal Act (CERCLA)?	No
Is the property the subject of corrective action under orders or agreement issued pursuant to provisions of Part 3 of Article 15 of this Title or the federal RCRA of 1976, as amended?	No
Is the property subject to an order issued by or an agreement (including permits) with the Water Quality Control Division pursuant to Part 6 of Article 8 of this Title?	No
Is the property a facility that has or should have a permit or interim status pursuant to Part 3 of Article 15 of this Title (RCRA Subtitle C) for treatment, storage, or disposal of hazardous waste?	No
Is the property subject to the provisions of Colorado Revised Statutes, Part 5 of Article 20 of Title 8 (Underground Storage Tanks)?	No

3.0 HISTORICAL INVESTIGATIONS

The following site investigations have been completed for the site. The findings from these investigations are summarized in this Application.

REPORT	DATE	ATTACHMENT
Limited Site Investigation, Terracon	07/24/2007	Appendix A
Geotechnical Engineering Report, Terracon	07/24/2007	Appendix B
Limited Site Investigation, Terracon	10/09/2017	Appendix C
Phase I ESA, Terracon	06/18/2021	Appendix D
Limited Site Investigation, Terracon	12/03/2021	Appendix E

4.0 ENVIRONMENTAL ASSESSMENTS

Historical investigations conducted at the site included Phase I ESAs and soil, groundwater, and soil gas sampling to identify contaminants of concern (COCs) related to on-site sources identified in the Phase I ESAs. Data from the historical investigations were compared to the present-day Risk Based Soil Screening Levels (SSLs), where an exceedance of the Risk-Based SSL indicates the contaminant may leach to groundwater. Several metals, volatile organic compounds (VOCs), and/or detection limits for these contaminants were detected at concentrations above their respective Risk-Based SSLs; however, in the groundwater samples collected from the site during Terracon's July 2007 LSI, benzene, arsenic, and selenium were the only constituents reported above their respective CDPHE Groundwater Quality Standard (CGWQS), and during Terracon's November 2021 LSI, benzene was not reported above the laboratory detection limit. Therefore, the contaminants detected above their respective Risk-Based SSLs do not indicate additional COCs for the site as they have not appeared to leach to groundwater.

COCs in soil gas include a number of VOCs detected across the site in the soil gas samples collected during the 2017 LSI. The following VOCs in soil gas were detected at concentrations that represent a vapor intrusion concern for residential/industrial/commercial property use: benzene, chloroform, 1,4-dichlorobenzene, ethylbenzene, naphthalene, trichloroethylene, and vinyl chloride. In addition, carbon tetrachloride, dichlorodifluoromethane, and tetrachloroethylene concentrations represented a vapor intrusion concern for residential but not commercial/industrial use.

Methane was evaluated against its Lower Explosive Limit (LEL), which is 50,000 parts per million by volume (ppmv). Laboratory methane detections ranged from 1,790 ppmv to 10,900 ppmv. Methane concentrations exceeded 10% of the LEL or 5,000 ppmv for methane at SVP-01, SVP-03, SVP-05, and SVP-07. The laboratory analysis of methane indicates a potential combustion risk at the site.

Soil sampling locations, groundwater sampling locations, and soil vapor sampling locations are depicted on Exhibit 2, Exhibit 3, and Exhibit 4 respectively. Soil and groundwater analytical data are included in Table 1 and Table 2, respectively. Soil gas analytical data is included in Table 3. The historical limited site investigations are discussed in detail below.

4.1 Qualifications of Professionals

Qualified professionals were involved in the preparation of the Terracon Phase I ESA, Terracon Limited Site Investigations, Terracon Geotechnical Engineering Report, and this VCP Application.

4.2 Limited Site Investigation – Terracon

A Limited Site Investigation (LSI) report was prepared by Terracon for VCGY-10, LLC, report dated July 24, 2007. The LSI was conducted to evaluate the potential for environmental impact of the site from historical onsite unpermitted landfill operations. Ten borings were advanced onsite as part of the geotechnical investigation, and four borings (3, 4, 6, and 9) were screened and had soils sampled as part of the LSI. The general soil lithology encountered during sample collection consisted of municipal landfill refuse (household trash including paper, lawn cuttings, clothing, plastic containers, and carpet, etc.) and was observed to depths ranging from 7.5 feet (Boring 10) to 16 feet bgs (Borings 8 and 9). Native soils underlying the refuse consisted of interbedded sand, gravel, cobbles, clay, and claystone bedrock and were observed to a depth of 35 feet bgs.

One composite soil sample was collected from each of the four LSI borings and analyzed for Resource Conservation and Recovery Act (RCRA) metals and bulk asbestos. In addition, a four-boring composite soil sample was submitted for Toxicity characteristic leaching procedure (TCLP) RCRA metals, TCLP volatile organic compounds, TCLP semi-volatile organic, Pesticides and polychlorinated biphenyls, and Herbicides. Terracon reported asbestos was not detected in the

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soil samples collected from the site. Several RCRA metals were detected above laboratory reporting limits; however, the detections did not exceed the current Residential Regional Screening Levels (RSLs) with the exception of arsenic, which exceeded the present-day Industrial RSL and Colorado average background concentrations. TCLP concentrations did not exceed Colorado hazardous waste standards. The reported arsenic concentrations in soil are summarized below:

- 15 mg/kg in soil boring B-3 and 26 mg/kg in soil boring B-4, above the Colorado background concentration of 11 mg/kg;
- 4.6 mg/kg in soil boring B-6, above the Industrial RSL of 3.0 mg/kg; and,
- 1.2 mg/kg in soil boring B-9, above the Residential RSL of 0.68 mg/kg.

Ten groundwater samples were collected from the site, one from each boring, and were analyzed for VOCs and dissolved RCRA metals. Groundwater was measured at depths of approximately 6 to 14 feet bgs. The following COCs were detected at concentrations above historical regulatory limits and the present-day CGWQS:

- Benzene in boring B3 at 6.8 µg/L, above the 5.0 µg/L CGWQS ;
- Arsenic in boring B6 at 26 µg/L, above the 10 µg/L CGWQS; and,
- Selenium in borings B3 and B6 at 68 and 67 µg/L, respectively, above the 50 µg/L CGWQS.

4.3 Preliminary Geotechnical Engineering Report - Terracon

A Preliminary Geotechnical Engineering Report was prepared by Terracon VCGY-10, LLC, dated July 18, 2007. The Geotechnical Report was conducted for a proposed multi-story residential development at the site. A total of 10 exploratory borings were drilled. Based on the results of the borings, subsurface conditions encountered on the project site consisted of approximately 2 to 4 feet of sandy clay and clayey sand fill cover, underlain by landfill debris mixed with sandy clay and clayey sand. Native sand and clay soils, with varying amounts of silt and gravel were encountered directly beneath the landfill materials and extend to depths of about 15 to 24 feet below existing site grade. A poorly-graded to well-graded sand and gravel layer, of variable thickness, underlies the sand and clay deposits. Bedrock consisting of claystone, with varying amounts of sand, was encountered below the sand and gravel layer and extends from depths of about 26 to 28½ feet below existing grade down to the full depth of exploration

The soil boring was observed for the presence and depth of groundwater. During drilling, groundwater was encountered at depths ranging from about 8 to 17 feet below existing site grade in a majority of the borings at the time of field exploration. When checked a minimum of 1 day after drilling, groundwater was measured at depths from about 6 to 14 feet below existing site grade.

4.4 Limited Site Investigation – Terracon

An LSI Report was prepared by Terracon for Chelton, LLC, report dated October 9, 2017. Fourteen soil gas points (SVP-01 through SVP-14) were installed at the site. Soil gas points were installed in borings that were advanced with a solid-stem auger drill rig. The soil gas points, consisting of 8.0-inch long stainless-steel screened points and Teflon tubing, were placed into each boring at an approximate depth of 5 feet bgs and backfilled with silica sand to approximately 6 inches above the top of the screen, followed by hydrated bentonite to near surface.

Borings typically encountered sand, landfill debris (e.g., wood, glass, wire, paper, plastic), and odors. Field screening indicated VOCs up to 18 parts per million (ppm) isobutylene equivalents (SVP-13) and methane concentrations up to 7% of the LEL (SVP-01). Measurements taken during purging indicated VOCs up to 4 ppm (several locations) and methane concentrations up to 99% of the LEL (SVP-01, SVP-03, and SVP-13).

One soil gas sample was collected from each soil gas point and analyzed for VOCs. A number of VOCs were detected across the site. The following VOCs in soil gas were detected at concentrations that represent a vapor intrusion concern for residential/industrial/commercial property use: benzene, chloroform, 1,4-dichlorobenzene, ethylbenzene, naphthalene, trichloroethylene, and vinyl chloride.

The following VOCs in soil gas were detected at concentrations that represent a vapor intrusion concern for only residential property use and not industrial/commercial property use: carbon tetrachloride, dichlorodifluoromethane, and tetrachloroethylene.

Methane was evaluated against its Lower Explosive Limit (LEL), which is 50,000 parts per million by volume (ppmv). Laboratory methane detections ranged from 1,790 ppmv to 10,900 ppmv. Methane concentrations at SVP-01, SVP-03, SVP-05, and SVP-07 exceeded 10% of the LEL or 5,000 ppmv for methane.

Soil gas analytical data is included in Table 3, respectively. Soil gas sampling locations are depicted on Exhibit 3.

4.5 Phase I Environmental Site Assessment – Terracon

A Phase I ESA was prepared for the site by Terracon for Carlson Associates, Inc., report dated June 18, 2021, in general accordance with ASTM E1527-13, to review historical records, document past land uses on the site and adjoining properties and identify possible environmental concerns regarding the site.

The site appears to have been primarily undeveloped land, with Ralston Creek meandering along the northern site boundary as early as 1937. Portions of the site appear to have been disturbed

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in 1937. From 1963 to 1978, operations at the south and later east adjoining properties appear to have encroached onto the southeast portion of the site. In 1983, the site appears to have a trail across the northern portion of the site, similar to its current day configuration.

A Jefferson County Methane Gas Site (JCMETHANE) listing as well as a Historical Solid Waste Landfill (HISTSWLF) listing is mapped within the boundaries of the site. The HISTSWLF was reportedly operational between 1939 to 1942 and operated by Jefferson County. Fill was reported at a depth approximately 20 feet below ground surface (bgs). Methane was also documented at the site by the Jefferson County Health Department.

Terracon identified the following controlled REC (CREC) in connection with the site:

- Historical use of the site as a landfill and the documented impact to groundwater and soil gas at the site.

Terracon recommended the following:

- Consultation with the Colorado Department of Public Health and Environment (CDPHE) regarding potential regulatory involvement driven by the historical landfill and documented impacts. Additional investigation and or mitigation/remediation measures may be required by CDPHE.
- Incorporation of an appropriately-designed vapor mitigation system (VMS) for any future buildings at the site.
- Conduct soil gas sampling along the perimeter of the site boundary in areas where neighboring buildings adjoin the site, and potentially in other areas.
- Use of a Materials Management Plan to facilitate management of environmentally impacted media during redevelopment activities.

4.6 Limited Site Investigation Report – Terracon

An LSI report was prepared by Terracon for Carlson Associates, Inc., dated December 3, 2021. The LSI was conducted to evaluate the documented historical on-site benzene impacts to groundwater and the depth and extents of landfill materials in the vicinity of proposed buildings and stormwater detention basin. A total of 5 exploratory borings (SB-11 through SB-15) were advanced to approximate depths of 15 to 19 feet bgs. Soil boring SB-11 was converted to a groundwater monitoring well. No soil samples were collected for laboratory analysis, and one groundwater sample was collected from the monitoring well installed at SB-11.

Groundwater analytical results were compared to the December 2020, CGWQS. Groundwater analytical data is included in Table 2. Soil boring locations and groundwater sampling locations are depicted on Exhibit 2 and Exhibit 3, respectively.

Soil Investigation Summary

- In general, the lithology encountered during drilling consisted of shallow silty sands and silts overlying 1.5 to 8.5 feet of landfill material except for SB-15, where landfill material was not observed. Silts and sands with some gravel were encountered below the landfill material to the terminal depths of 15 to 19 feet bgs.
- Field screening measured VOCs above the field detection limit of 1 ppm isobutylene equivalent in the screened soils from soil borings SB-11 through SB-15. VOCs were detected at a maximum concentration of 497 ppm isobutylene equivalents from SB-13 within the 2.5 to 5-foot bgs interval. Black discoloration was observed below the landfill material in soil borings SB-11 through SB-13.

Groundwater Investigation Summary

- Groundwater was encountered at approximately 9 to 10 feet bgs during drilling.
- Soil boring SB-11 was completed as a groundwater monitoring well to collect a groundwater sample to be analyzed for VOCs (benzene only).
- Laboratory analysis of the groundwater samples did not detect the presence of the COCs that were above the CGWQS.

4.7 Conceptual Site Model

Based on historical information obtained from the previous environmental assessments conducted at the site, the site consisted of open land that was disturbed in the late 1930s, and utilized as an unpermitted solid waste landfill from approximately 1939 to 1942, after which the site has remained vacant land. By 1983, the site appeared similar to its current configuration. The site currently exists as vegetated vacant land.

Previous Phase I ESAs conducted at the site identified the following recognized environmental conditions (RECs), controlled RECs (CRECs), and historical RECs (HRECs):

- Historical use of the site as a landfill and the documented impact to groundwater and soil gas at the site.

Previous subsurface assessments identified the general lithology to consist of shallow silty sands and silts overlying landfill materials as deep as 17 feet below ground surface (bgs). Below the landfill materials, silts, sands, and gravels were encountered. Claystone is encountered at 26 to

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28.5 feet below ground surface and extends to at least 35 feet bgs, which corresponds to the deepest point of investigation.

Groundwater was encountered at the site at depths ranging from approximately 6 to 14 feet bgs. The regional groundwater flow direction was identified to the northeast.

COCs identified at the site during previous subsurface assessments include sporadic arsenic in landfill materials and soils, limited benzene, arsenic, and selenium in groundwater, and VOCs in onsite soil vapor.

Arsenic was reported above Environmental Protection Agency (EPA) Residential and Industrial Regional Screening Levels (RSLs) and the Colorado background concentration in soil samples collected during the 2007 LSI.

Benzene was detected above the human health-based Colorado Groundwater Quality Standard (CGWQS) in one groundwater sample collected at the site during the 2007 LSI, however, the groundwater sample collected during the 2021 LSI from approximately the same location did not have a reported benzene concentration above laboratory reporting limits. Dissolved Resource Conservation and Recovery Act (RCRA) metals arsenic and selenium were also reported above CGWQS during the 2007 LSI. Selenium was reported slightly above the 50 µg/L CGWQS in two of ten groundwater samples, and arsenic was reported above the 10 µg/L CGWQS in one of ten groundwaters samples during the 2007 LSI. A use restriction is planned for site groundwater to prevent future exposure to COCs.

During the 2017 LSI, a number of VOCs were detected across the site in the soil gas samples. The following VOCs in soil gas were detected at concentrations that represent a vapor intrusion concern for residential/industrial/commercial property use: benzene, chloroform, 1,4-dichlorobenzene, ethylbenzene, naphthalene, trichloroethylene, and vinyl chloride. In addition, carbon tetrachloride, dichlorodifluoromethane, and tetrachloroethylene concentrations represented a vapor intrusion concern for residential but not commercial/industrial use.

Methane was evaluated against its Lower Explosive Limit (LEL), which is 50,000 parts per million by volume (ppmv). Laboratory methane detections ranged from 1,790 ppmv to 10,900 ppmv. Methane concentrations exceeded 10% of the LEL or 5,000 ppmv for methane at SVP-01, SVP-03, SVP-05, and SVP-07. The laboratory analysis of methane indicated a potential combustion risk at the site. Soil vapor investigation along the site perimeter has not been conducted, however, the northern, western, and southern property boundaries are constrained by Ralston Creek and the Croke Canal. The creek and canal likely provide a divide along the site boundaries, and saturated soil makes vapor intrusion beyond them unlikely.

5.0 APPLICABLE STANDARDS/RISK DETERMINATION

The following standards were used for risk determination at the site:

- The EPA RSLs for soil (May 2021: Target Cancer Risk (TR) of 1E-6, Hazard Quotient (HQ) or 1.0), and further evaluated using exposure-route specific screening levels for industrial land use;
- The Colorado background concentration for arsenic, per the CDPHE Arsenic Concentrations in Soil Risk Management Guidance for Evaluating (Reviewed/ Revised July 2014);
- The CDPHE Water Quality Control Commission published Basic Standards for Groundwater, for groundwater standards (June 30, 2020), referred to as CGWQS in this document; and,
- The 2016 Colorado Department of Public Health and Environment (CDPHE) Indoor Air Screening Concentrations (ASC) – Residential and Worker Remediation Goals, and the June 2017 USEPA Residential and Industrial Indoor Air RSLs, after applying a 3% attenuation factor for sub-slab soil gas per the USEPA Office of Solid Waste and Emergency Response (OSWER) Technical Guide for Assessing and Mitigating the Gas Intrusion Pathway from Subsurface Gas Sources to Indoor Air (OSWER Guidance, June 2015).

After implementation of the remediation plan described below, potential risks to human health or environment on-site will be considered low. The general risk factors are discussed in more detail in the following sections.

6.0 EXPOSURE PATHWAYS AND MITIGATION

The following exposure pathways are considered to be complete or potentially complete during or construction (refer to Tables 1-4 for a comparison of soil, groundwater, and soil gas concentrations to exposure-specific screening levels for industrial land use):

- Industrial Soil Dermal Contact (Soil_{I-Derm});
- Industrial Soil Ingestion (Soil_{I-Ing});
- Soil Leach to Groundwater (Soil_{GW}); and,
- Industrial Vapor Intrusion (Soil Gas_{VI}).

As noted in the investigation summaries, soil impacts exceeding Colorado background levels were limited to arsenic in soil borings B3 and B4 advanced as part of Terracon's 2007 LSI.

Voluntary Cleanup Application

Former Kilmer Landfill – Proposed Storage Development ■ Arvada, Colorado
January 20, 2022 ■ Terracon Project No. 25217269



Several metals, volatile organic compounds (VOCs), and/or detection limits for these contaminants were detected at concentrations above their respective Risk-Based SSLs; however, in the groundwater samples collected from the site during Terracon’s July 2007 LSI, benzene, arsenic, and selenium were the only constituents reported above their respective CDPHE Groundwater Quality Standard (CGWQS), and during Terracon’s November 2021 LSI, benzene was not reported above the laboratory detection limit. Arsenic and selenium in soil boring B-6 were detected above the SSLs and above CGWQS, which indicated the potential for leaching from landfill materials and soil in this area. Other contaminants detected above their respective Risk-Based SSLs do not indicate additional COCs for the site as they have not appeared to leach to groundwater.

The industrial soil exposure routes were further evaluated using US EPA exposure-route specific screening levels (ingestion, dermal contact, and inhalation). Results are shown in Table 3. The maximum arsenic concentration that exceeded the generic Industrial RSL and Colorado background levels also exceeded the Soil Ingestion Screening Level and Soil Dermal Contact Screening Level. The Soil Inhalation Screening Level was not exceeded. Vapor intrusion exposure routes were evaluated using USEPA industrial/worker screening levels. The concentrations of multiple VOCs exceeded the USEPA Industrial RSL. Results are shown in Table 4.

EXPOSURE PATHWAY	SOIL	GROUND WATER	SURFACE WATER	SEDIMENT	BUILDING MATERIALS	
Soil – Dermal Contact (Soil _{Derm})	C*	NA	NA	NA	NA	
Soil – Ingestion (Soil _{Ing})	C*					
Soil – Vapor Inhalation (Soil _{Inh})	NC					
Soil – Leach to Groundwater (Soil _{GW})	C					
Soil Gas – Vapor Intrusion (Soil Gas _{VI})	C*					
Groundwater – Ingestion (GW _{Ing})	NA	NC	NA	NA	NA	
Groundwater – Vapor Inhalation (GW _{Inh})		NC				
Groundwater – Migration to Surface Water (GW _{SW})		NA	NA	NA		NA
Surface Water – Dermal Contact (SW _{Derm})						
Surface Water – Ingestion (SW _{Ing})						
Sediment – Dermal Contact (Sed _{Derm})						
Sediment – Ingestion (Sed _{Ing})						

NA – Exposure pathway not applicable to the media

NC – Not anticipated to be complete

C – Exposure pathway complete

* For industrial/worker exposures

The following table summarizes the environmentally-impacted media on- and off-site, based on Terracon’s assessment activities and results.

ENVIRONMENTAL MEDIA	ACTION LEVELS EXCEEDED?						TYPES OF IMPACTS
	ON-SITE			OFF-SITE			
	Yes	No	Not Sampled	Yes	No	Not Sampled	
Soil	X					X	Arsenic
Groundwater		X				X	
Soil Vapor	X					X	VOCs & Methane
Surface Water			NA			NA	
Sediment			NA			NA	
Building Materials			NA			NA	

NA – Exposure pathway not applicable to the media

6.1 Soil Pathways

As noted in Section 6.0, the Industrial RSL/Colorado background concentration for arsenic were exceeded, and soil exposure routes related to construction workers or commercial land use are considered complete.

Industrial/Worker RSL soil exposure pathways are considered complete. The developer intends to excavate impacted soil/landfill material for off-site disposal where it is encountered. The soil vapor inhalation pathway not is considered complete at the site as COCs were not detected above the industrial/worker soil inhalation screening level in the soil samples collected from the site. The soil contaminant leaching to the groundwater pathway is potentially complete at the site based on the soil and groundwater analytical results reported from soil boring B-6.

Based on the proposed construction, engineering controls, and Environmental Use Restriction, the Soil_{I-Derm}, Soil_{I-Ing}, and Soil_{GW} pathways are not anticipated to be complete after redevelopment. The proposed construction will consist of an RV storage parking lot, a stormwater detention basin, and a storage office building. The majority of the site will not require excavation to facilitate construction, with the exception of the stormwater detention basin area, installation of light poles, and a small amount of underground utility installation. The majority of the remainder of the property will be streetscaped and landscaped areas, with packed gravel or compacted asphalt millings as surfacing materials. The proposed construction should mitigate the completion of the Soil_{I-Derm} and Soil_{I-Ing} pathways if residual impacts remain following excavation activities, and reduce groundwater infiltration into onsite landfill materials. The methods to characterize, manage, and dispose of impacted soil are described in more detail in Section 7.0 and in the MMP, which is included as Appendix F.

6.2 Soil Gas Pathways

The soil gas vapor intrusion pathway is considered complete at the site based on soil gas sampling results indicating the presence of multiple VOCs above USEPA and screening levels for intrusion to indoor air, and methane above 10% of the LEL in site soil gas.

6.3 Groundwater Pathways

The groundwater ingestion pathway is not considered complete at the site, as the site office building will be serviced by a municipal water supply. In addition, no dewatering activities are anticipated during construction.

Regarding the groundwater vapor intrusion pathway, historical exceedances for VOCs in groundwater samples collected at the site were limited to benzene in one groundwater sample collected during a 2007 LSI. A groundwater sample collected from a monitoring well installed in approximately the same location as B-3 in November 2021 did not have a reported benzene concentration above laboratory detection limits, therefore, the groundwater vapor intrusion pathway is not considered complete.

57 existing water wells (not abandoned) registered with the Colorado Division of Water Resources were identified within 2,640 feet (0.5 miles) of the site and are depicted in Exhibit 5 and listed on Table 5. Several domestic/household wells were identified within 2,640 feet of the site, however, groundwater impacts were not identified onsite.

7.0 REMEDIAL ACTION PLAN

The proposed RAP for the site considers no new changes to the current planned development of the site and includes specific remedial tasks that will be implemented to mitigate and reduce short-term and long-term exposures to site contaminants. The conceptual RAP selected for this site is summarized below.

7.1 Excavation and Disposal of Impacted Soil

Excavation activities during redevelopment will be conducted to facilitate construction of the RV storage parking lot, stormwater detention basin, installation of light poles, a small amount of underground utility installation, and storage office building. Based on Terracon's July 2007 LSI results, arsenic concentrations exceeded EPA Industrial RSLs and the Colorado background standard in two soil samples collected from across the site, so arsenic will be considered a COC based on historical knowledge of the landfill material. Based on professional experience, it is expected that other RCRA metals, VOCs, and semi-volatile organic compounds (SVOCs) may be encountered in the landfill material. It is anticipated that landfill material excavated and generated to facilitate development will be sampled, characterized and disposed of as a special waste at a

Subtitle D Landfill per the Materials Management Plan (MMP) based on a waste characterization profile created from analytical data for the site.

7.2 Lining of Stormwater Detention Basin

In the stormwater detention basin area, Terracon's November 2021 LSI identified landfill materials beginning at 1.5 to 3 feet bgs, and approximately 6 feet deep, with a maximum depth of 9 feet bgs. Based on the planned depth of the stormwater basin, landfill materials will likely be exposed during construction. The stormwater basin area may require over-excavation of the bottom and sidewalls to allow adequate placement of clean fill and/or clay liner type material to prevent direct exposure of landfill waste to the surface or detained stormwater, and to prevent stormwater from infiltrating into the landfill materials. The stormwater detention pond and liner system will be designed by the project civil engineer, Harris Kocher Smith (HKS), in accordance with applicable solid waste standards.

In the event ACM is encountered during redevelopment activities, it shall be managed in accordance with the MMP and in compliance with CDPHE Air Regulation No. 8 and Title 6 of the Colorado Code of Regulations, Paragraph 1007-2, Part 1 - Regulations Pertaining to Solid Waste Sites and Facilities., Section 5.5 Management of Regulated Asbestos-Contaminated Soil.

7.3 Vapor Mitigation System Installation

As noted in Section 6.2, on-site occupied buildings will require an active vapor mitigation system to mitigate the soil gas vapor intrusion exposure pathway. The VMS will be designed by a professional engineer and contain LEL and pressure sensors and be tied to a fire control panel in the event that vapors exceed 5 and 10 percent trigger levels. The installation of the vapor mitigation system will be observed and tested under the supervision of a professional engineer licensed in Colorado to document that the membrane and other system infrastructure has been installed per the manufacturer's and design specifications. The VMS will be tested and certified by the professional engineer to ensure proper operation prior to building occupancy.

7.4 Notice of Environmental Use Restriction and NAD Request

The proposed remedial actions identified are considered to be protective of human health and the environment as exposure to landfill materials, arsenic in soils, and VOCs and methane in soil gas will be mitigated either through the removal of landfill materials or through engineered controls. However, impacted landfill material will be left in place at concentrations that exceed EPA Industrial/Worker RSLs and vapor intrusion screening levels that predict indoor air quality exceedances. Following the completion of the RAP a request for a No Action Determination (NAD) will be prepared and submitted to CDPHE. If deemed appropriate, the NAD request will include a proposed Notice of Environmental Use Restriction. The proposed Use Restriction would include language that generally describes the following:

Voluntary Cleanup Application

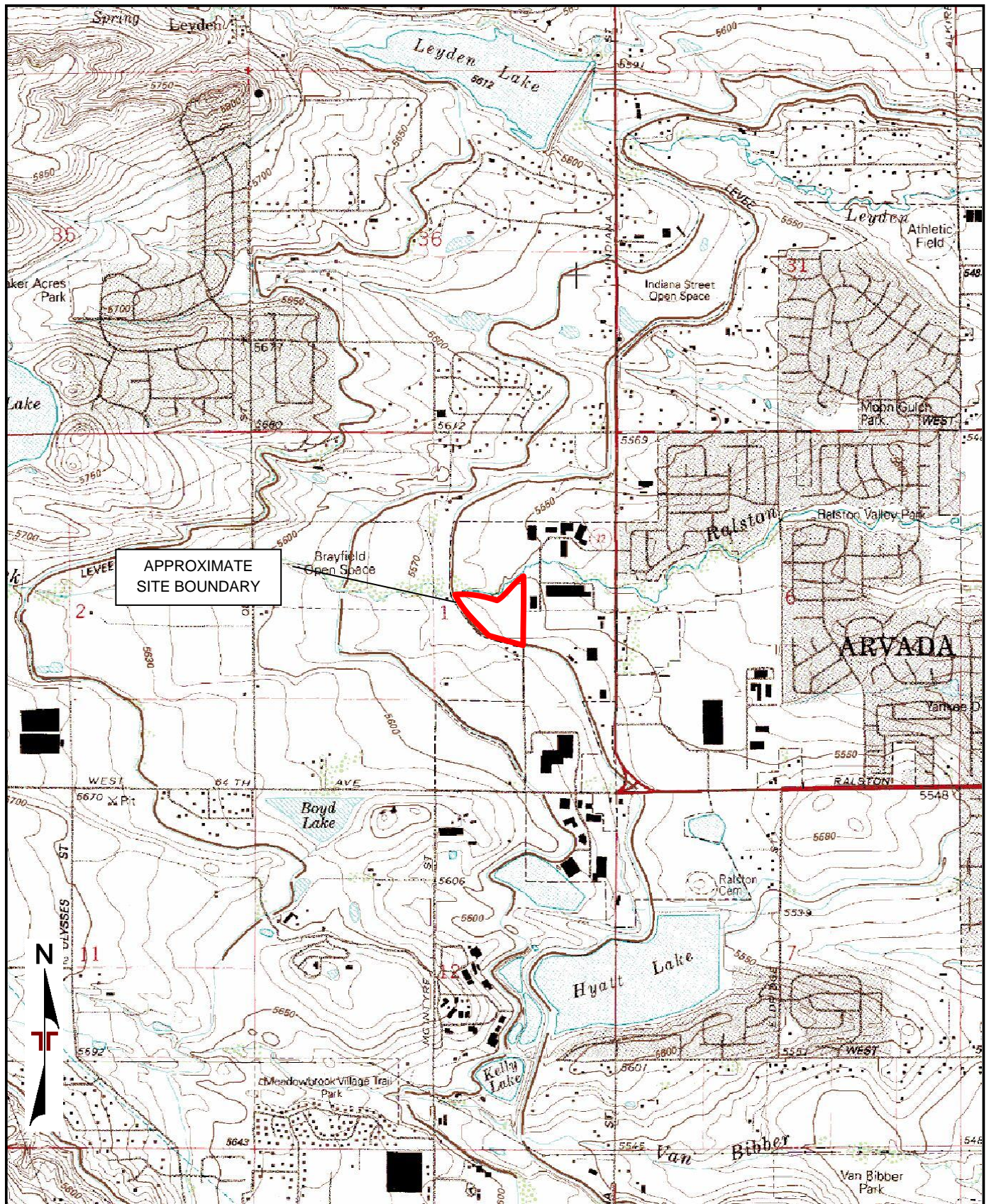
Former Kilmer Landfill – Proposed Storage Development ■ Arvada, Colorado

January 20, 2022 ■ Terracon Project No. 25217269



- Restriction to the disturbance of soils and landfill material in areas where landfill materials and/or arsenic-impacted soil exceedances exist.
- Restriction of the use of onsite groundwater.
- Placement of an active vapor mitigation system beneath building footprints over areas with exceedances of vapor intrusion screening levels.

EXHIBITS



APPROXIMATE
SITE BOUNDARY

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: GOLDEN, CO (11/1994).

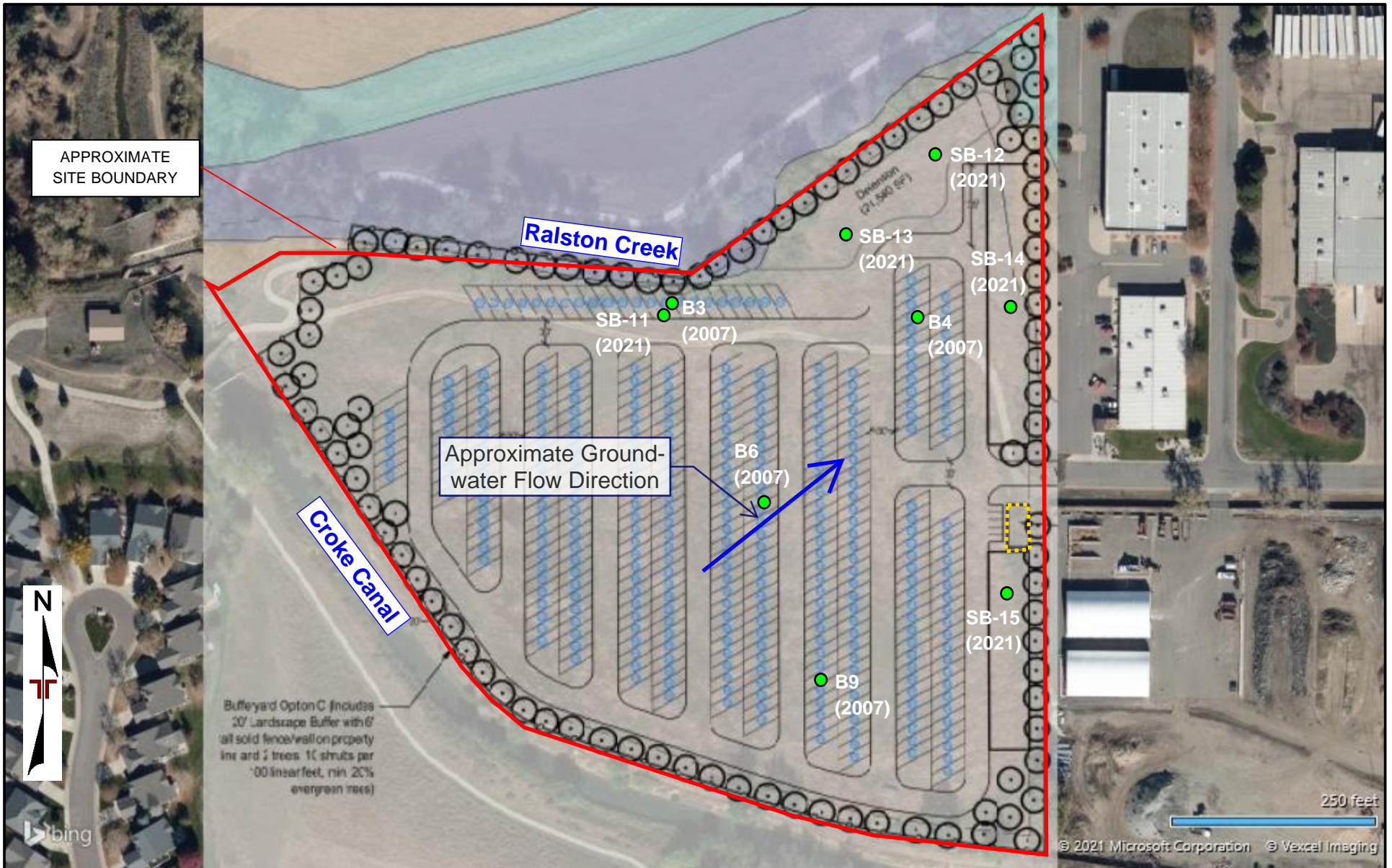
Project Manager:	JDA
Drawn by:	JDA
Checked by:	MEW
Approved by:	MEW

Project No.	25217269
Scale:	1"=2,000'
File Name:	Exhibit
Date:	12/20/2021

Terracon
10625 W 170 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

TOPOGRAPHIC MAP
Former Kilmer Landfill – Proposed Storage
Development
6800 Kilmer Street
Arvada, Colorado

Exhibit	1
---------	---



AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

● Soil Boring Location

 Proposed Building Footprint

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: JDA
Drawn by: JDA
Checked by: MEW
Approved by: MEW

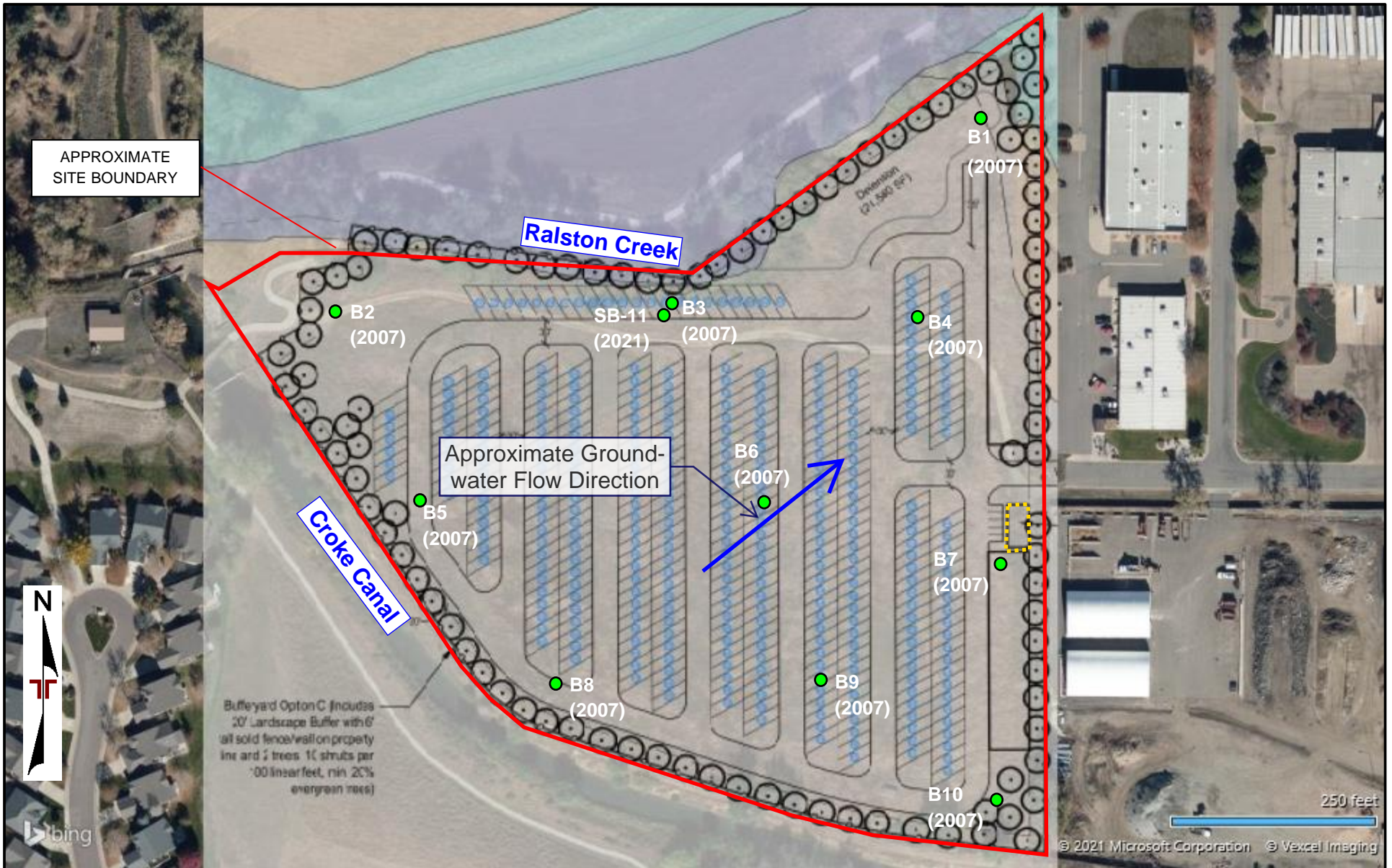
Project No. 25217269
Scale: AS SHOWN
File Name: Exhibit 3
Date: 12.21.2021

Terracon

10625 W 170 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

SOIL SAMPLING LOCATIONS Former Kilmer Landfill - Proposed Storage Development 6800 Kilmer Street, Arvada, Colorado
--

Exhibit 2



AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

● Groundwater Sample Location

▭ Proposed Building Footprint

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager:

JDA

Drawn by:

JDA

Checked by:

MEW

Approved by:

MEW

Project No.

25217269

Scale:

AS SHOWN

File Name:

Exhibit 3

Date:

12.21.2021

Terracon

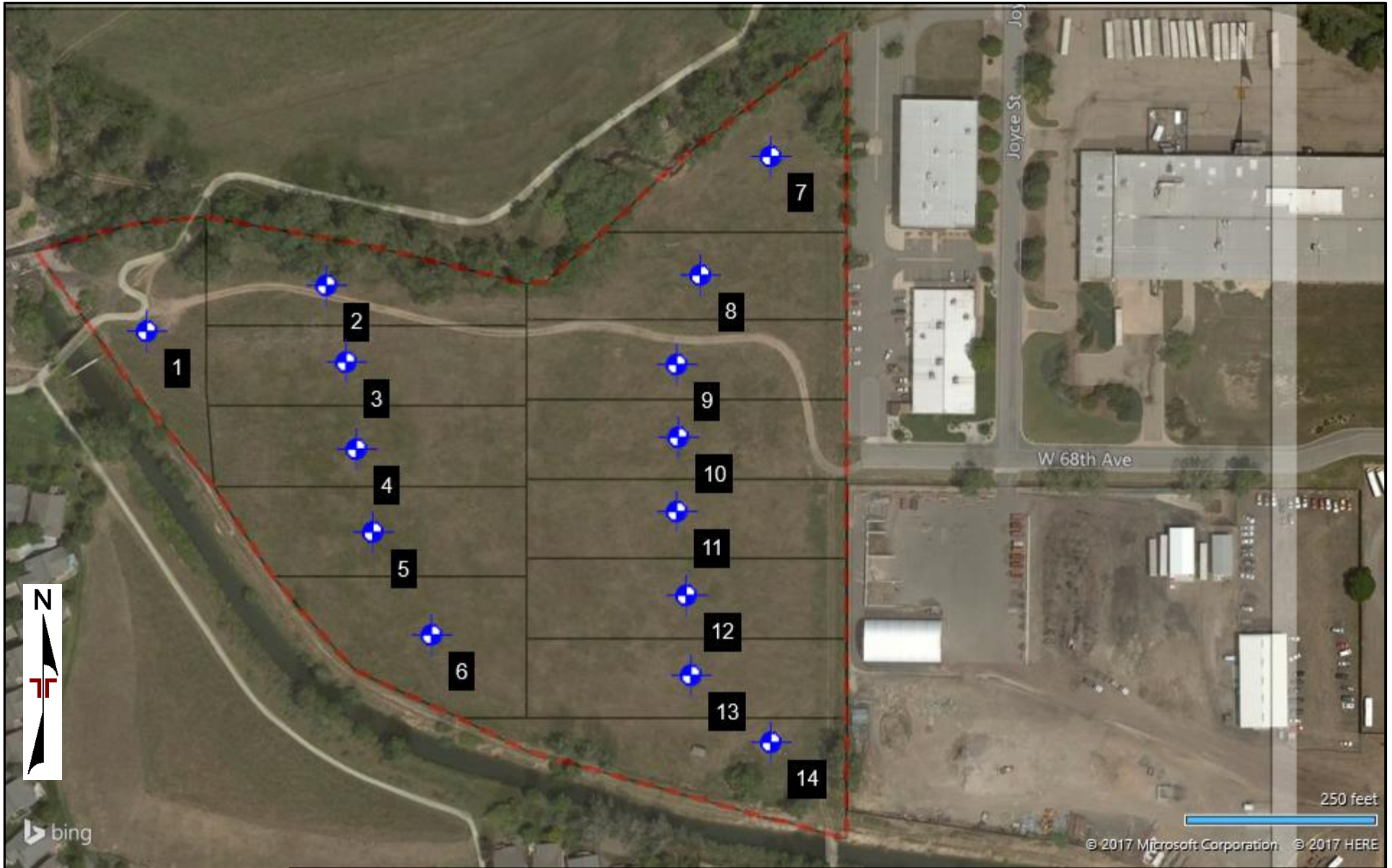
10625 W 170 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

GROUNDWATER SAMPLING LOCATIONS

Former Kilmer Landfill - Proposed Storage Development
6800 Kilmer Street,
Arvada, Colorado

Exhibit

3



AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: JDA
 Drawn by: NWH
 Checked by: MEW
 Approved by: MEW

Project No. 25217269
 Scale: AS SHOWN
 File Name: Exhibit 4
 Date: 12/20/21

Terracon
 10625 W I 70 Frontage Rd N Ste 3
 Wheat Ridge, CO 80033-1729

SOIL VAPOR SAMPLING LOCATIONS (2017)

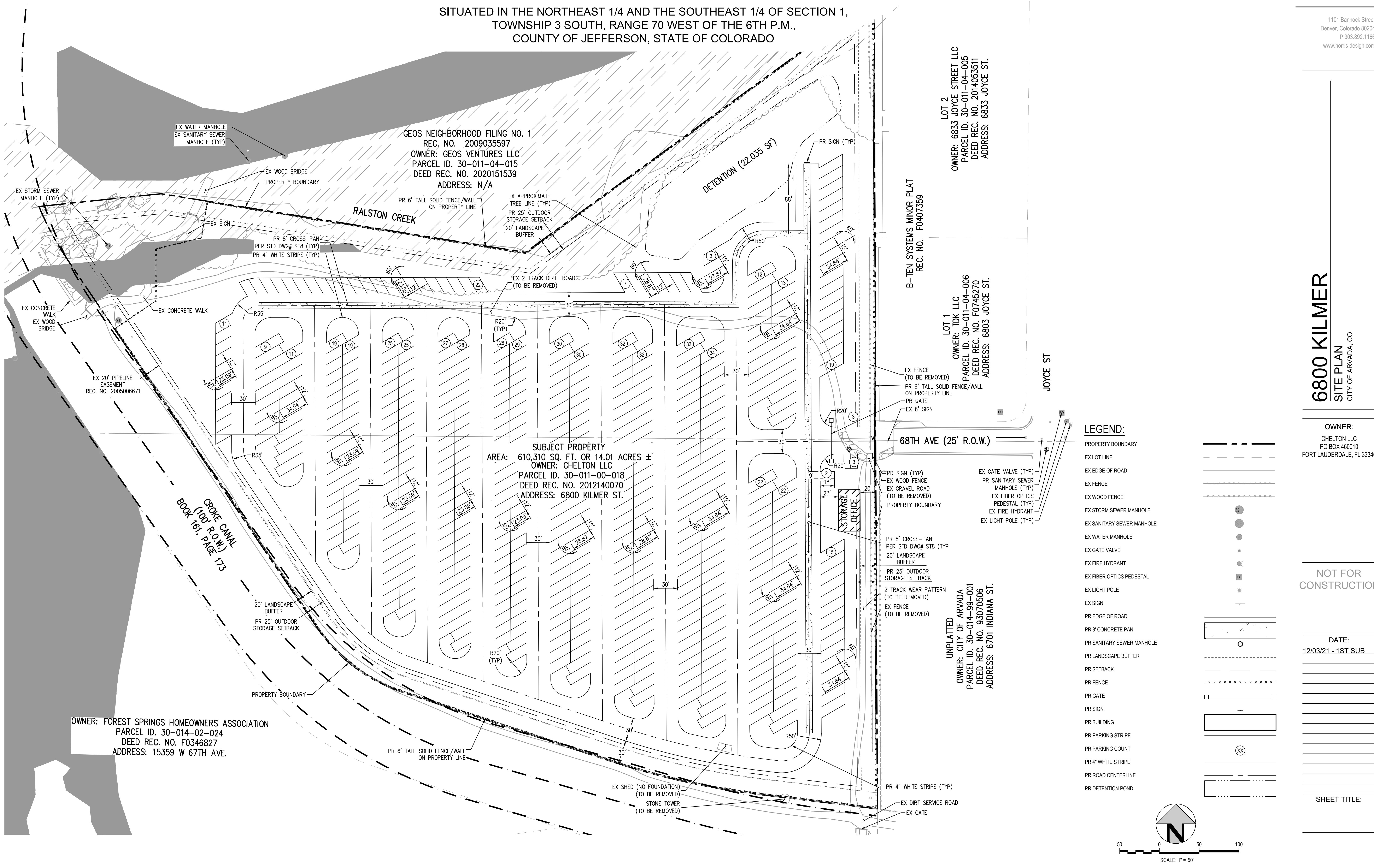
Former Kilmer Landfill - Proposed Storage Development
 6800 Kilmer Street
 Arvada, Colorado

Exhibit

4

6800 KILMER SITE PLAN

SITUATED IN THE NORTHEAST 1/4 AND THE SOUTHEAST 1/4 OF SECTION 1,
 TOWNSHIP 3 SOUTH, RANGE 70 WEST OF THE 6TH P.M.,
 COUNTY OF JEFFERSON, STATE OF COLORADO



GEOS NEIGHBORHOOD FILING NO. 1
 REC. NO. 2009035597
 OWNER: GEOS VENTURES LLC
 PARCEL ID. 30-011-04-015
 DEED REC. NO. 2020151539
 ADDRESS: N/A

LOT 2
 OWNER: 6833 JOYCE STREET LLC
 PARCEL ID. 30-011-04-005
 DEED REC. NO. 2014053511
 ADDRESS: 6833 JOYCE ST.

LOT 1
 OWNER: TDK LLC
 PARCEL ID. 30-011-04-006
 DEED REC. NO. F0745270
 ADDRESS: 6803 JOYCE ST.

SUBJECT PROPERTY
 AREA: 610,310 SQ. FT. OR 14.01 ACRES ±
 OWNER: CHELTON LLC
 PARCEL ID. 30-011-00-018
 DEED REC. NO. 2012140070
 ADDRESS: 6800 KILMER ST.

68TH AVE (25' R.O.W.)

OWNER: FOREST SPRINGS HOMEOWNERS ASSOCIATION
 PARCEL ID. 30-014-02-024
 DEED REC. NO. F0346827
 ADDRESS: 15359 W 67TH AVE.

UNPLATTED
 OWNER: CITY OF ARVADA
 PARCEL ID. 30-014-99-001
 DEED REC. NO. 93070506
 ADDRESS: 6701 INDIANA ST.

LEGEND:

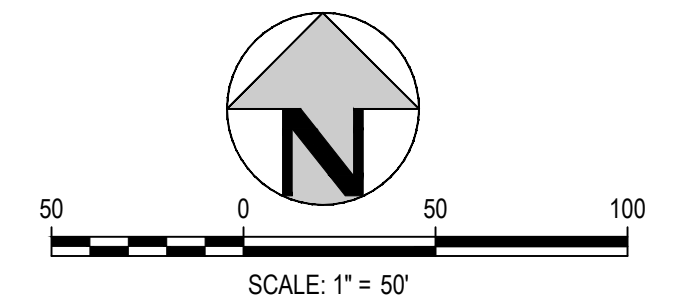
- PROPERTY BOUNDARY
- EX LOT LINE
- EX EDGE OF ROAD
- EX FENCE
- EX WOOD FENCE
- EX STORM SEWER MANHOLE
- EX SANITARY SEWER MANHOLE
- EX WATER MANHOLE
- EX GATE VALVE
- EX FIRE HYDRANT
- EX FIBER OPTICS PEDESTAL
- EX LIGHT POLE
- EX SIGN
- PR EDGE OF ROAD
- PR 8" CONCRETE PAN
- PR SANITARY SEWER MANHOLE
- PR LANDSCAPE BUFFER
- PR SETBACK
- PR FENCE
- PR GATE
- PR SIGN
- PR BUILDING
- PR PARKING STRIPE
- PR PARKING COUNT
- PR 4" WHITE STRIPE
- PR ROAD CENTERLINE
- PR DETENTION POND

OWNER:
 CHELTON LLC
 PO BOX 460010
 FORT LAUDERDALE, FL 33346

NOT FOR
 CONSTRUCTION

DATE:
 12/03/21 - 1ST SUB

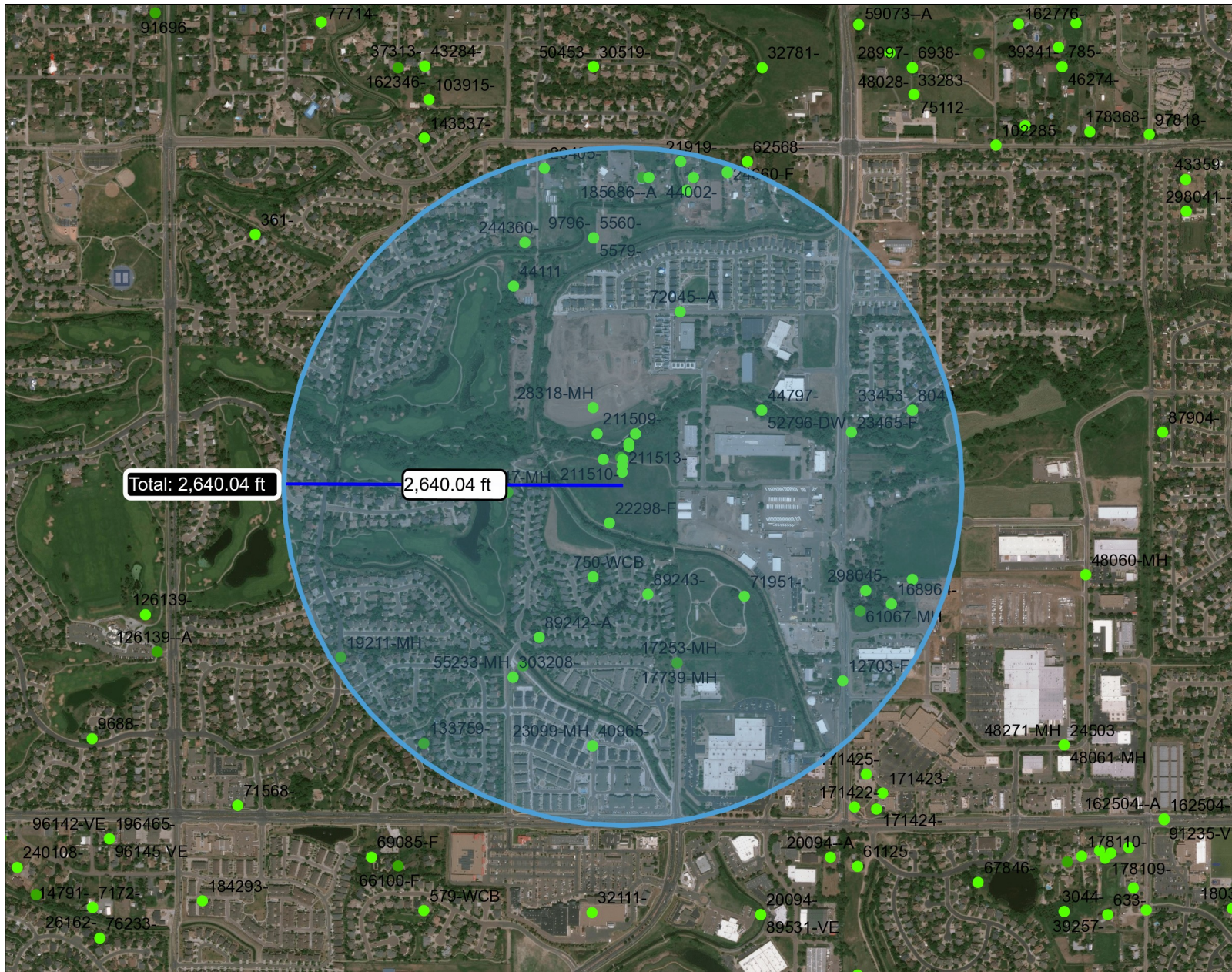
SHEET TITLE:



CHECKED BY: BR, JK
 DRAWN BY: GH, JK



Exhibit 6 - Regional Groundwater Well Location Map



Total: 2,640.04 ft

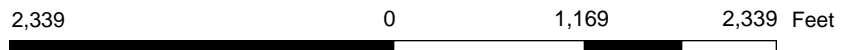
2,640.04 ft

Legend

- Well Constructed
- Permit Issued
- OGCC Well
- County

Location

Notes



1: 14,032



This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Date Prepared: 12/21/2021 11:14:37 AM

TABLES

Table 1
Summary of Detected Analytes in Soil
Former Kilmer Landfill - Proposed Storage Development
6800 Kilmer Street, Arvada, Colorado
Terracon Project No. 25217269

Sample ID and Depth				B-3 COMP	B-4 COMP	B-6 COMP	B-9 COMP
Collection Date				5/25/07	5/25/07	5/25/07	5/25/07
Parameter	Residential RSL	Industrial RSL	Risk-Based SSL	mg/kg	mg/kg	mg/kg	mg/kg
RCRA Metals (6020B / 7471)							
Arsenic ¹	0.68	3.0	0.0015	15	26	4.6	1.2
Barium	15,000	220,000	160	180	200	98	120
Cadmium	71	980	0.69	1.1	0.64	1.5	0.28
Chromium	NE	NE	NE	30	16	14	22
Lead	400	800	NE	160	31	71	14
Mercury	11	46	0.033	0.087	0.14	6.4	0.047
Selenium	390	5,800	0.52	5.5	4.5	5.0	3.0

RSL = US Environmental Protection Agency (EPA) Regional Screening Level (May 2021)

SSL = US EPA Soil Screening Level (May 2021)

mg/kg = milligram per kilogram

Only detected analytes shown (detected concentrations are **bold**)

Shading = Indicates an exceedance of the regulatory value with the corresponding color

NE = Not Established

RCRA = Resource Conservation and Recovery Act

¹ The CDPHE Background concentration is 11 mg/kg, per the Risk Management Guidance for Evaluating Arsenic Concentrations

VOC = Volatile Organic Compounds

SVOC = Semivolatile Organic Compounds

PCB = Polychlorinated Biphenyl

NA = Not Analyzed

Table 2
Summary of Detected Analytes in Groundwater
Former Kilmer Landfill - Proposed Storage Development
6800 Kilmer Street, Arvada, Colorado
Terracon Project No. 25217269

Sample ID		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	SB-11
Collection Date		5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	5/30/07	11/3/21
Parameter	CDPHE Reg. 41 Groundwater Standard ¹	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dissolved RCRA Metals (6010B/7470A)												
Arsenic	10^M	<20	<20	<20	<20	<20	24	<20	<20	<20	<20	NA
Barium	2,000^M	290	90	430	1100	420	360	330	280	480	99	NA
Selenium	50^M	<20	<20	68	<20	<20	67	<20	<20	<20	<20	NA
VOCs (8260B)												
Benzene	5^M	<1.0	<1.0	6.8	<1.0	<1.0	<1.0	<1.0	1.8	2.0	<1.0	<1.0
1,4-Dichlorobenzene	75^M	<1.0	<1.0	7.9	5.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA
Naphthalene	140	<5.0	<5.0	15	<5.0	<5.0	<5.0	<5.0	12	<5.0	<5.0	NA
Xylenes, Total	1,400 to 10,000^M	<3.0	<3.0	3.8	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	NA

CDPHE = Colorado Department of Public Health and Environment
 Reg. 41 = Water Quality Control Commission Regulation No. 41 - The Basic Standards for Ground Water (June 30, 2020)

¹ Colorado Department of Public Health and Environment Basic Standards for Ground Water (Regulation 41, Table A, Table 1, and Table 2 June 30, 2020)

Note: When a range of standards is listed, the first number in the range is a human health-based value and the second number in the range is a Maximum Contaminant Level (MCL).

^M Drinking water MCL

µg/L = micrograms per liter

RCRA = Resource Conservation and Recovery Act

Only detected analytes shown (detected concentrations are **bold**)

VOC = Volatile Organic Compounds

NA = Not Analyzed

Table 3
Industrial Exposure Route Evaluation – Soil
Former Kilmer Landfill - Proposed Storage Development
6800 Kilmer Street, Arvada, Colorado
Terracon Project No. 25217269

Sample ID and Depth				B-3 COMP	B-4 COMP	B-6 COMP	B-9 COMP
Collection Date				5/25/07	5/25/07	5/25/07	5/25/07
Landuse:	Industrial/Composite Worker			mg/kg	mg/kg	mg/kg	mg/kg
Parameter/Exposure- Route Specific SL ¹ :	Ingestion SL	Dermal SL	Inhalation SL				
Arsenic	3.6	17	3,900	15	26	4.6	1.20

1) US EPA Screening Level, 1E-06 carcinogenic risk, 1 Target Hazard Quotient (May 2021)
mg/kg = milligram per kilogram

Table 4
Summary of Soil Vapor Industrial Exceedances
Former Kilmer Landfill - Proposed Storage Development
6800 Kilmer Street, Arvada, Colorado
Terracon Project No. 25217269

Sample ID	SVP-01	SVP-02	SVP-03	SVP-04	SVP-05	SVP-06	SVP-07	SVP-08	SVP-09	SVP-10	SVP-11	SVP-12	SVP-13	SVP-14	Maximum Reported Conc.	Calculated Indoor Air Conc. ¹		
Collection Date	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017	08/31/2017		
Parameter	USEPA Industrial RSL	CDPHE Worker ASC	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³		
VOC (TO-15)																		
Benzene	1.6	1.6	78.6	11	249	7.3	2.79	13	10.4	12	3.86	9.49	11.2	<51.1	114	5.76	249	7.47
Chloroform	0.53	0.53	<77.9	73.2	<38.9	36.3	90.7	29	49.1	60.7	1.04	149	12.7	<77.9	<77.9	10.3	149	4.47
1,4-Dichlorobenzene	1.1	1.1	<96.2	<1.2	49.6	<1.2	<1.2	1.78	2.95	<9.62	<1.2	4.52	1.77	<96.2	<96.2	2.62	49.6	1.49
Ethylbenzene	4.9	4.9	2,110	9.22	1300	1.99	1.26	1.95	4.16	<6.94	3.11	8.54	3.62	87.9	167	32	2,110	63.3
Naphthalene	0.36	NE	<264	<3.3	<132	4	<3.3	5.69	13	<26.4	<3.3	<3.3	7.3	<264	<264	4.54	13	0.390
Trichloroethylene	3	3	418	1.55	175	7.72	<1.07	2.39	2.06	<8.57	<1.07	65.9	1.45	123	148	4.61	418	12.5
Vinyl chloride	2.8	2.8	289	<0.511	68.4	<0.511	<0.511	<0.511	<0.511	<4.09	<0.511	<0.511	<0.511	<40.9	196	<0.511	289	8.67
Methane (8015M)	10% LEL	25% LEL	LEL															
Methane (parts per million by vol)	5,000	12,500	50,000	10,900	NA	8,090	NA	7,870	NA	5,540	NA	NA	1,790	NA	NA	4,980	NA	

NOTES:

1) As calculated using a 3% attenuation factor per the Office of Solid Waste and Emergency Response Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (June 2015) and the maximum reported concentration

RSL = United States Environmental Protection Agency (USEPA) Indoor Air Regional Screening Level (June 2017), µg/m³

ASC = Colorado Department of Public Health and Environment (CDPHE) Air Screening Concentrations, Remediation Goals (January 2016), µg/m³

NE = Not Established

NA = Not Applicable

< = Less than the laboratory reported detection limit

µg/m³ = micrograms per cubic meter

LEL = Lower Explosive Limit

Only detected analytes shown (detected concentrations are **bold**)

- Calculated Indoor Air Concentration exceeds Industrial RSL or Worker ASC**
- Methane concentration exceeds 10% of the LEL**
- Methane concentration exceeds 25% of the LEL**
- Methane concentration exceeds the LEL**

Table 5
List of Regional Groundwater Wells
Former Kilmer Landfill - Proposed Storage Development
6800 Kilmer Street, Arvada, Colorado
Terracon Project No. 25217269

Receipt	Permit	Latitude	Longitude	Contact Name	Well Type
17253	17253-MH	39.815947	-105.169853	JEFFERSON CNTY SCHOOLS	Monitoring/Sampling
17739	17739-MH	39.815947	-105.169853	JEFFCO SCHOOLS	Monitoring/Sampling
23099	23099-MH	39.814164	-105.172209	FARMERS HIGH LINE CANAL & RESERVOIR	Monitoring/Sampling
24121	94350-VE	39.826347	-105.170818	SCHNELL TOM & DEBBIE	Domestic
0028318H	28318-MH	39.821414	-105.172187	CO DEPT MILITARY AFFAIRS	Monitoring/Sampling
0033595A	211509-	39.820858	-105.172078	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595B	211510-	39.820309	-105.171902	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595C	211511-	39.820652	-105.17119	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595D	211512-	39.82058	-105.17119	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595E	211513-	39.820175	-105.171376	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595F	211514-	39.82086	-105.171015	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595G	211515-	39.82031	-105.171376	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
0033595H	211516-	39.82003	-105.171375	COLO DEPT OF MILITARY AFFAIRS	Monitoring/Sampling
52796	52796-DW	39.821356	-105.167486	VALLES, CONSTRUCTION	Dewatering
0053997Q	91-GX	39.823285	-105.17018	KLEBL, NORBERT	Other
0053997R	91-GX	39.823366	-105.170133	KLEBL, NORBERT	Other
0053997S	91-GX	39.823114	-105.170179	KLEBL, NORBERT	Other
0053997T	91-GX	39.823068	-105.170378	KLEBL, NORBERT	Other
0053997U	91-GX	39.823194	-105.17039	KLEBL, NORBERT	Other
55233	55233-MH	39.815638	-105.174425	CENTURY COMMUNITIES LLC	Monitoring/Sampling
59646		39.819604	-105.174572	HAYES CONSULTING CO	Monitoring/Sampling
59647	59647-MH	39.819604	-105.174572	HAYES CONSULTING CO	Monitoring/Sampling
61067	61067-MH	39.817058	-105.164743	SPA PROPERTIES LLC	Monitoring/Sampling
62665	62665-MH	39.820346	-105.171423	CARLSON ASSOCIATES INC	Monitoring/Sampling
0077107A	89243--A	39.817428	-105.170668	MURRAY EARL & RUTH	Domestic, Stock
0077107B	89243-	39.817419	-105.170668	MURRAY EARL N & RUTH	Domestic
0077107D		39.817789	-105.172198	MURRAY, E R	Domestic, Stock
0077107E	22298-F	39.81894	-105.171735	MURRAY, E R	Domestic, Stock
200888	24660-F-R	39.826468	-105.168446	DONALDSON CRAIG W & SUSAN	Irrigation
0200888A	24660-F	39.826441	-105.168446	SMITH, GERALD R	Domestic, Irrigation
256328	30764--A	39.82607	-105.169567	VON MICHAELS CAROL & DAVID M STOCKER	Domestic
349412	168964-	39.817203	-105.163879	REHR JERRY & ROBERTA	Household use only
0373568B	185686--A	39.826348	-105.170643	SCHNELL TOM & DEBBIE	Domestic
496223	244360-	39.824955	-105.174098	VOSE, MELINDA J	Domestic
918546	2403-AD	39.82607	-105.169567	WILLIAM R FORBES	Irrigation
3669863	298045-	39.81749	-105.16458	BATES, VONA J	Domestic, Stock
3675445A	303208-	39.815638	-105.174425	CENTURY COMMUNITIES	Monitoring/Sampling
3675445B	303209-	39.815873	-105.174157	CENTURY COMMUNITIES	Monitoring/Sampling
9025532	5560-	39.825055	-105.172176	SCHERBEL, HENRY	Domestic
9025536	5579-	39.825055	-105.172176	SCHERBEL, JOHN	Domestic
9025915	8042-	39.821359	-105.163276	BEVER, ERNEST	Domestic
9026170	9796-	39.825055	-105.172176	SCHIBEL, JOHN	Domestic
9026511	12703-F	39.815561	-105.16523	HEIMMER DONALD H & TAYLOR KEVIN J	Irrigation
9027526	21919-	39.826691	-105.169744	DREYER, SHARRON C	Domestic
9027675	23465-F	39.820896	-105.164986	JURY, HOWARD D	Irrigation
9028759	33453-	39.821359	-105.163276	GREER, THEODORE M	Domestic
9029062	36849-	39.825055	-105.172176	FEAR A CURTIS & KIMBERLY A	Domestic
9029392	40965-	39.814164	-105.172209	ASHLEY, FRANCES	Domestic
9029657	44002-	39.82634	-105.169393	VON MICHAELS CAROL & DAVID M	Domestic
9029661	44111-	39.824017	-105.174412	FORBES, DONALD B	Domestic
9029718	44797-	39.821356	-105.167486	GILLIGAN FAMILY LTD PARTNERSHIP	Domestic, Stock
9030978	62568-	39.826685	-105.167886	ARCURI ANTHONY P & NOELLE S	Domestic
9031602	71951-	39.817368	-105.16798	GOLDEN RETRIEVER RESCUE OF THE ROCKIES	Domestic
9031613	72045--A	39.823475	-105.16976	WICKHAM CLARK J & DORIS L	Domestic
9033083	89242--A	39.816495	-105.173691	KULA, JOHANN	Domestic, Stock
C300750	750-WCB	39.817789	-105.172198	MURRAY, EARL	Domestic
C301824	1824-WCB	39.817734	-105.163278	HERRING, GORDON	Domestic

APPENDIX A
LIMITED SITE INVESTIGATION REPORT – TERRACON (On
CD)

APPENDIX B
PRELIMINARY GEOTECHNICAL ENGINEERING REPORT –
TERRACON
(On CD)

APPENDIX C
LIMITED SITE INVESTIGATION REPORT - TERRACON
(On CD)

APPENDIX D
PHASE I ENVIRONMENTAL SITE ASSESSMENT – TERRACON
(On CD)

APPENDIX E
LIMITED SITE INVESTIGATION REPORT – TERRACON
(On CD)

APPENDIX F
MATERIALS MANAGEMENT PLAN – TERRACON (On CD)