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UNITED STATES DEPARTMENT OF JUSTICE
AND
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 8
AND
THE STATE OF COLORADO

IN THE MATTER OF:	CERCLA Docket No. CERCLA-08-2022-0005
Sand Creek Superfund Site Operable Units 3 & 6 Commerce City, Colorado	
Triangle Logistics Center, LLC,	**ADMINISTRATIVE SETTLEMENT AGREEMENT FOR RESPONSE ACTIONS AND PAYMENT OF RESPONSE COSTS BY PROSPECTIVE PURCHASER**
Purchaser	

TABLE OF CONTENTS

I. GENERAL PROVISIONS

1. This Administrative Settlement Agreement for Response Actions and Payment of Response Costs by Prospective Purchaser ("Settlement") is entered into voluntarily by and between the United States on behalf of the Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment on behalf of the State of Colorado (the "State"), and the prospective purchaser, Triangle Logistics Center, LLC, a Delaware limited liability company ("Purchaser"). This Settlement provides for the performance of response actions by Purchaser and the payment of certain response costs incurred by the United States and the State at or in connection with the property consisting of five parcels totaling approximately ninety-two (92) acres with South Adams County Assessor parcel numbers 0182317300008, 0182317300029, and City and County of Denver Assessor parcel numbers 01184-00-014-000, 01184-01-008-000, and 01184-01-007-000 (the "Property"), which is part of Operable Units ("OUs") 3 and 6 of the Sand Creek Industrial Superfund Site ("Site").

2. This Settlement is entered into pursuant to the authority of the Attorney General to compromise and settle claims of the United States, consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §§ 9601-9675. EPA is proceeding under the CERCLA authority vested in the President of the United States and delegated to the Administrator of EPA and further delegated to the undersigned Regional official.

3. The State is entering into this Settlement pursuant to Section 25-16-103, C.R.S.

4. The Purchaser agrees to undertake all actions required by the terms and conditions of this Settlement. In view of the risk of claims under CERCLA being asserted against Purchaser upon it becoming an owner of the Property, one of the purposes of this Settlement is to resolve Purchaser's potential CERCLA liability in accordance with the covenants not to sue in Section XVIII (Covenants Not to Sue by United States and the State), subject to the reservations and limitations contained in Section XIX (Reservations of Rights by United States and the State).

5. The resolution of this potential liability, in exchange for Purchaser's performance of the Work, is fair, reasonable, and in the public interest.

6. The United States, the State and Purchaser (collectively, the "Parties") recognize that this Settlement has been negotiated in good faith and that the actions undertaken by Purchaser in accordance with this Settlement do not constitute an admission of any liability. Purchaser does not admit and it retains the right to controvert in any subsequent proceedings, other than proceedings to implement or enforce this Settlement, the validity of the statement of facts and determinations in Sections IV (Statement of Facts) and V (Determinations) of this Settlement. Purchaser agrees to comply with and be bound by the terms of this Settlement, and to not contest the basis or validity of this Settlement or its terms, or the United States' or State's right to enforce this Settlement.

II. PARTIES BOUND

7. This Settlement is binding upon the United States, the State, and Purchaser and upon Purchaser's successors and assigns. Any change in ownership or corporate status of Purchaser does not alter Purchaser's responsibilities under this Settlement.

8. **Transfer.** Purchaser may Transfer title to the Property or any portion of the Property to any third party, including a Title 32 Metropolitan District and/or any other governmental or quasi-governmental entity or owners' association, without the approval or consent of EPA or the State, provided that Purchaser shall continue to be bound by all terms and conditions, and remain the sole party entitled to all benefits, of this Settlement. Otherwise, Purchaser may Transfer its rights, obligations, and benefits of the Settlement, either together or with or separate from title to the Property, to any such third party in whole or in part, provided EPA, the State, and Purchaser so agree and modify this Settlement in writing, pursuant to Section XXVI, and subject to the following:

a. Any such Transfer by Purchaser, of the rights, benefits, and obligations conferred upon Purchaser under this Settlement, shall require the prior written consent of the EPA and the State in their sole discretion, and is not subject to judicial review.

b. EPA and the State expect the transferee to any such Transfer of all or any portion of the Property, as applicable, to avail itself of protections afforded a "bona fide prospective purchaser" under 42 U.S.C. Sections 9601(40) and 9607(r)(1) and will maintain its status as a "bona fide prospective purchaser" for the duration of its interest in the Property that is transferred. Written agreement of Transfer and/or any modification to this Settlement shall document to whom the rights, benefits, and obligations are conferred, and shall include EPA approval of modifications to the Work Plan, intended to ensure continued protectiveness of the remedy.

c. Prior to or simultaneous with any such Transfer of all or any of Purchaser's rights, benefits, and obligations hereunder by Purchaser, the future transferee must consent in a written modification to this Settlement, pursuant to Section XXVI, to be bound by all the transferred terms, conditions, and obligations of this Settlement, which must include but are not limited to Section VII, the certifications contained in Section XVII, contribution protection under Section XXVI of this Settlement, and financial assurance under Section XXV in order for the covenants not to sue in Section XVIII to be available to that party. The covenants not to sue in Section XVIII and the contribution protection under Section XXVI will be effective with respect to any transferee upon counter signature by EPA and the State.

d. Purchaser agrees to pay the reasonable costs incurred by EPA and the State to review any subsequent request for consent to transfer the rights, benefits, and obligations conferred by this Settlement.

e. Following modification of this Settlement in accordance with this Paragraph 8, any such transferee may further Transfer its rights, obligations, and benefits under this Settlement, either together with or separate from title, to all or a portion of the Property, to another third party, subject to the terms and conditions of this Paragraph 8.

f. Such modification shall be in substantially the form attached as Appendix 8.

9. Each of the undersigned representatives of Purchaser certifies that the signatory is authorized to enter into the terms and conditions of this Settlement and to execute and legally bind Purchaser to this Settlement.

10. Consistent with the requirements of Section VI (Designation of Contractor, Project Coordinator, and Remedial Project Manager), Purchaser may contract for performance of any of Purchaser's obligations hereunder to a third party, including a Title 32 Metropolitan District and/or any other governmental or quasi-governmental entity or owners' association, without the approval of EPA or the State, provided that Purchaser shall continue to be bound by all the terms and conditions and remain the sole party entitled to all benefits of this Settlement. Purchaser shall provide a copy of this Settlement to each contractor hired to perform the Work required by this Settlement and to each person representing Purchaser with respect to the Property or the Work, and it shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this Settlement. Purchaser or its contractors shall provide written notice of the Settlement to all subcontractors hired to perform any portion of the Work required by this Settlement. Purchaser shall nonetheless be responsible for ensuring that its contractors and subcontractors perform the Work in accordance with the terms of this Settlement.

III. DEFINITIONS

11. Unless otherwise expressly provided in this Settlement, terms used in this Settlement that are defined in CERCLA or in regulations promulgated under CERCLA have the meaning assigned to them in CERCLA or in such regulations, including any amendments thereto. Whenever terms listed below are used in this Settlement, the following definitions apply:

"CDPHE" means the Colorado Department of Public Health & Environment and any successor departments or agencies of the State

"CERCLA" means the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675.

"Day" or "day" means a calendar day. In computing any period of time under this Settlement, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period runs until the close of business of the next working day.

"DOJ" means the United States Department of Justice and its successor departments, agencies, or instrumentalities.

"Effective Date" means the effective date of this Settlement as provided in Section XXXI.

"EPA" means the United States Environmental Protection Agency and its successor departments, agencies, or instrumentalities.

"EPA Hazardous Substance Superfund" means the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

"Existing Contamination" means:

a. any hazardous substances, pollutants or contaminants present or existing on or under the Property prior to or as of the Effective Date;

b. any hazardous substances, pollutants or contaminants that migrated from the Property prior to the Effective Date; and

c. any hazardous substances, pollutants or contaminants present or existing at the Site as of the Effective Date that migrate onto, under or from the Property after the Effective Date.

"Institutional Controls" means Proprietary Controls and state or local laws, including the Colorado Environmental Covenants and Notices of Environmental Use Restrictions Statute, section 25-15-317 to 327, C.R.S., as well as regulations, ordinances, zoning restrictions, or other governmental controls or notices that: (a) limit land, water, or other resource use to minimize the potential for human exposure to Waste Material at or in connection with the Site; (b) limit land, water, or other resource use to implement, ensure non-interference with, or ensure the protectiveness of the remedy; and/or (c) provide information intended to modify or guide human behavior at or in connection with the Site. A compilation of Institutional Controls for the Property are attached as Appendix 5.

"Interest" means interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest is the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year. Rates are available online at https://www.epa.gov/superfund/superfund-interest-rates.

"National Contingency Plan" or "NCP" means the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

"Operable Unit 3" or "OU3" means the soils, groundwater, and surface water associated with the 48th and Holly landfill portion of the Site, encompassing approximately 150 acres, in both Commerce City, Adams County, Colorado and Denver, Denver County, Colorado, and depicted generally on the map attached as Appendix 2.

"Operable Unit 6" or "OU6" means the methane gas associated with the 48th and Holly landfill portion of the Site, encompassing approximately 150 acres, in both Commerce City, Adams County, Colorado and Denver, Denver County, Colorado, and depicted generally on the map attached as Appendix 2.

"Paragraph" means a portion of this Settlement identified by an Arabic numeral or an upper- or lower-case letter.

"Parties" means the United States, the State, and Purchaser.

"Property" means that portion of the Site, encompassing approximately ninety-two (92) acres, to be acquired by Purchaser, which is generally depicted with a map in Appendix 3 of this Settlement and with the legal description and surveyed boundaries in Appendix 4 of this Settlement. The property is a triangular shape, bounded by 48th Avenue to the south, Dahlia Street to the west, 52nd Street to the north and the intersection of BNSF Railway railroad right-of-way and 48th Avenue to the east.

"Proprietary Controls" shall mean easements, covenants, or restrictive notices running with the land that (a) limit land, water, or other resource use and/or provide access rights and (b) are created pursuant to common law or statutory law by an instrument that is recorded in the appropriate land records office.

"Purchaser" means Triangle Logistics Center, LLC, a Delaware limited liability company, as the prospective purchaser of the Property.

"RCRA" means the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901-6992 (also known as the Resource Conservation and Recovery Act).

"Response Costs" means all costs, including, but not limited to, direct and indirect costs, that the United States incurs (1) in reviewing or developing deliverables submitted pursuant to this Settlement; (2) in overseeing implementation of the Work, or otherwise implementing, overseeing, or enforcing this Settlement, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, community involvement costs; (3) the costs incurred pursuant to Section VIII (Property Requirements) (including, but not limited to, cost of attorney time and any monies paid to secure or enforce access or land, water, or other resource use restrictions, and/or to secure implement, monitor, maintain, or enforce Institutional Controls, including, but not limited to, the amount of just compensation); the costs incurred pursuant to Section XII (Emergency Response and Notification of Releases); Paragraph 92 (Work Takeover); the costs incurred pursuant to Paragraph 113 (Access to Financial Assurance); the costs incurred pursuant to Section XIV (Dispute Resolution); the costs incurred pursuant to Paragraph 8 (Transfer); (4) all litigation costs incurred; and (5) costs incurred in development and negotiation of this Settlement, between December 1, 2020 and the Effective Date.

"RPM" means the Remedial Project Manager, as defined in 40 C.F.R. § 300.5.

"ROD" means the EPA Record of Decision relating to the Sand Creek Industrial Superfund Site, Operable Units 3 and 6, signed on June 3, 1993.

"Section" means a portion of this Settlement identified by a Roman numeral.

"Settlement" means this Administrative Settlement Agreement for Response Actions and Payment of Response Costs by Prospective Purchaser, all appendices attached hereto (listed in Section XXVII (Integration/Appendices)), and all deliverables included under and incorporated by reference into this Settlement. In the event of conflict between this Settlement and any appendix, this Settlement controls.

"Site" means the Sand Creek Industrial Superfund Site, located in both Commerce City, Adams County, Colorado and Denver, Denver County, Colorado, and depicted generally on the map attached as Appendix 2.

"Sand Creek Special Account" means the special account within the EPA Hazardous Substance Superfund, established for the Site by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C. § 9622(b)(3).

"State" means the State of Colorado.

"State Response Costs" means all costs, including, but not limited to, direct and indirect costs, that the State incurs (1) in reviewing or developing deliverables and submittals related to the development of the Property and operations and maintenance of the remedy for OUs 3 and 6 of the Site, from October 1, 2020 to the Effective Date, and all deliverables and submittals pursuant to this Settlement, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, community involvement costs, and attorney costs; (2) in overseeing implementation of the Work, or otherwise implementing, overseeing, or enforcing this Settlement, including but not to, payroll costs, contractor costs, travel costs, laboratory costs, community involvement costs, and attorney costs; (3) the costs incurred pursuant to Section VIII (Property Requirements) (including, but not limited to, cost of attorney time and any monies paid to secure or enforce access or land, water, or other resource use restrictions, and/or to secure implement, monitor, maintain, or enforce Institutional Controls, including, but not limited to, the amount of just compensation); Section XII (Emergency Response and Notification of Releases); Paragraph 92 (Work Takeover); Paragraph 113 (Access to Financial Assurance); Section XIV (Dispute Resolution); Paragraph 8 (Transfer); (4) all litigation costs; and (5) costs incurred in development and negotiation of this Settlement, between December 1, 2020 and the Effective Date, including attorney costs.

"State Project Manager" means the CDPHE personnel designated as the Site project manager.

"Transfer" means to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

"United States" means the United States of America and each department, agency, and instrumentality of the United States.

"Waste Material" means (a) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (b) any pollutant or contaminant under Section 101(33) of

CERCLA, 42 U.S.C. § 9601(33); (c) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27).

"Work" means all activities and obligations Purchaser is required to perform under this Settlement, except those required by Section X (Record Retention).

"Work Plan" means the document describing the activities Purchaser must perform to implement the response actions pursuant to this Settlement, as set forth in Appendix 1, and any modifications made thereto in accordance with this Settlement.

IV. STATEMENT OF FACTS

12. The Site is located at 48th and Holly in Commerce City, Adams County, Colorado and Denver, Denver County, Colorado and encompasses an area of approximately 550 acres. Beginning in the 1940s, several types of businesses operated at the Site, including an oil refinery, pesticide manufacturing facility, an herbicide chemical plant, and a landfill. Site operations, waste management practices, spills and explosions at the Site contaminated soil, air, groundwater, and surface water with hazardous chemicals.

13. EPA divided the Site in OUs for the purposes of response actions. The OUs which are the subject of this Settlement are OUs 3 and 6, which pertain to the landfill portion of the Site.

14. The landfill, encompassing approximately 150 acres, is bordered on the north by East 52nd Avenue, on the south by East 48th Avenue, on the west by Dahlia Street, and on the east by the intersection of the railroad right-of-way and East 48th Avenue, approximately one-quarter mile east of Ivy Street.

15. Operations began at the landfill in 1967. Fill operations began at the southern end of the landfill and proceeded north in one layer or "lift." Cover material was graded from on-Site areas and the waste was watered to aid compaction. The landfill accepted both demolition and domestic refuse, which were sorted prior to dumping. Wastes disposed of at the landfill included household, industrial, institutional, commercial, and agricultural wastes, among others. Metal refuse was placed under the nearby railroad right-of-way. The landfill was closed in 1975 and revegetated.

16. In 1982, the EPA performed an investigation of the area to determine whether the Site should be placed on the National Priorities List (NPL). Analytical results indicated the presence of several volatile organic compounds in the surface and ground water, including 1,1 dichloroethane (1,1-DCA), 1,2 transdichloroethene (1,2 trans-DCE), 1,1,1-tricholoethane (1,1,1-TCA) and 1,1-dichloroethene (1,1-DCE). Inorganic compounds that were detected at concentrations elevated above background levels included arsenic, cadmium, nickel, and zinc.

17. Pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, in December 1982, the Site was added to the NPL, set forth at 40 C.F.R. Part 300, Appendix B.

18. A Remedial Investigation/Feasibility Study (RI/FS) was completed in 1988 for the Site. Twenty-three contaminants of concern were identified at the Site which constituted a

threat to human health and/or the environment. These chemicals included volatile organics and heavy metals that have been determined to be carcinogenic and/or to pose the greatest relative risk to humans and the environment. The presence of these volatile organic compounds and heavy metals constitute a release and/or threatened release of a hazardous substance at the Site.

19. Identified potential release mechanisms associated with the landfill include leaching of chemicals in refuse and their subsequent movement into the groundwater and volatilization of landfill gases, including methane. Identified potential transport processes from the landfill include groundwater flow and withdrawal, groundwater discharge to surface water, and dispersion of volatile organics. Identified potential exposure pathways include inhalation of ambient air for local residents, nearby workers, and the schools nearest the landfill, as well as dermal exposure through human contact with surface water.

20. A supplemental RI and FS was completed in 1992 to characterize target compounds/chemicals at the Site which may have contributed to groundwater contamination by the landfill. In March 1993, due to results of additional sampling events, an OU3 RI and Focused FS were completed.

21. In accordance with Section 117 of CERCLA, 42 U.S.C. § 9617, EPA issued a Proposed Plan for OUs 3 and 6 on March 19, 1993. The Proposed Plan, along with the Focused FS, results from the RA, and the Administrative Record were all made available to the public for comment.

22. EPA's selection of a remedy for OUs 3 and 6 is embodied in a ROD, executed on June 30, 1993 (available at: https://semspub.epa.gov/work/08/809865.pdf).

23. The selected remedy reduces risk to potential exposed populations and the environment through control of both landfill gases and exposure to contaminated groundwater and by restricting contact with the landfill.

24. In January 1994, pursuant to Sections 106(a) and 107 of CERCLA, 42 U.S.C. §§ 9606(1) and 9607, EPA issued a Unilateral Administrative Order for Remedial Design and Remedial Action (UAO) to Browning-Ferris Industries of Colorado, Incorporated and Burlington Northern Railroad Company.

25. Since 1994, pursuant to the UAO, a Landfill Gas Extraction System (LFGES) has been operated; a soil cover system, fencing, and signage for the landfill has been maintained; environmental monitoring programs for landfill gas, groundwater, and well abandonment have been implemented; and Institutional Controls have been implemented.

26. Following completion of the construction of the remedy components for all OUs, EPA deleted the Site from the Superfund program's National Priorities List (NPL) in 1996. Sitewide operations and maintenance activities are ongoing in order to ensure the long-term protectiveness of the remedy.

27. Purchaser is acquiring the Property to develop an industrial park and logistics center.

28. Purchaser intends to construct an industrial park and logistics center ("Park") on the Property and may own, lease, and/or operate the Park in its entirety, may sell or lease individual buildings within the Park, or may sell the Park in its entirety. Therefore, pursuant to the terms and conditions of this Settlement, Purchaser anticipates that a metropolitan district, authorized under the Special District Act of Colorado (C.R.S. §§ 32-1-101, *et seq.*), and/or an owner's association, will be formed to finance, manage, and conduct long-term operations and maintenance for the Property.

V. DETERMINATIONS

29. Based on the Statement of Facts set forth above, and the administrative record, EPA has determined that:

a. The Site is a "facility" and the Property is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. The contamination found at the Site and the Property, as identified in the Statement of Facts above, includes "hazardous substance(s)" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

c. Purchaser is a "person" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

d. The conditions described in Paragraphs 16 to 19 of the Statement of Facts above constitute an actual or threatened "release" of a hazardous substance from the Site and/or the Property as defined by Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

e. The conditions present at the Site may constitute an imminent and substantial endangerment to the public health, welfare, or the environment under Section 104(a) of CERCLA, 42 U.S.C. § 9604(a).

f. The Work required by this Settlement is necessary to protect the public health, welfare, or the environment and, if carried out in compliance with the terms of this Settlement, will be consistent with the NCP, as provided in Section 300.700(c)(3)(ii) of the NCP.

g. The Institutional Controls required by this Settlement are necessary to protect public health, welfare, and the environment.

VI. DESIGNATION OF CONTRACTOR, PROJECT COORDINATOR, AND REMEDIAL PROJECT MANAGER

30. Purchaser has designated, and EPA has not disapproved, the following contractor, who will be responsible for performance of the Work: Mark White, Terracon, 10625 W. I-70 Frontage Road, Suite 3, Wheat Ridge, Colorado 80333, 303-454-5208, mewhite@terracon.com. Purchaser shall also notify EPA and the State of the names, titles, contact information, and qualifications of any other contractors or subcontractors retained to perform the Work at least ten (10) days prior to commencement of such Work. EPA retains the right to disapprove of any or all of the contractors and/or subcontractors retained by Purchaser. If EPA disapproves of a selected

contractor or subcontractor, Purchaser shall retain a different contractor or subcontractor and shall notify EPA of that contractor's or subcontractor's name, title, contact information, and qualifications within fifteen (15) days after EPA's disapproval. With respect to any proposed contractor, Purchaser shall demonstrate that the proposed contractor demonstrates compliance with ASQ/ANSI E4:2014 "Quality management systems for environmental information and technology programs – Requirements with guidance for use" (American Society for Quality, February 2014), by submitting a copy of the proposed contractor's Quality Management Plan (QMP). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, Reissued May 2006) or equivalent documentation as determined by EPA. The qualifications of the persons undertaking the Work for Purchaser are subject to EPA's review for verification based on objective assessment criteria (e.g., experience, capacity, technical expertise) and that they do not have a conflict of interest with respect to the project.

31. Purchaser has designated, and EPA has not disapproved, the following individual as Project Coordinator, who will be responsible for administration of all actions by Purchaser required by this Settlement: Lynx Chan, LC Development Consulting, 1807 S. Washington, Suite 327, Naperville, IL 60565, 312-209-0608, lynx.chan@lcdevcon.com. EPA retains the right to disapprove of a designated Project Coordinator who does not meet the requirements of Paragraph 30. Notice or communication relating to this Settlement from EPA to Purchaser's Project Coordinator constitutes notice or communication to Purchaser. Purchaser has the right, subject to Paragraph 30, to change its designated Project Coordinator. Purchaser shall notify EPA and the State fifteen (15) days before such a change is made. The initial notification by Purchaser may be made orally to EPA and the State but shall be promptly followed by a written notice.

32. EPA has designated Sai Appaji of the Superfund and Emergency Management Division, Region 8, as its Remedial Project Manager (RPM). EPA has the right to change its designated RPM. All deliverables, notices, notifications, proposals, reports, and requests specified in this Settlement must be in writing, unless otherwise specified, and be submitted by email to Sai Appaji at Appaji.Sairam@epa.gov.

33. The RPM is responsible for overseeing Purchaser's implementation of this Settlement. The RPM has the authority vested in an RPM by the NCP, including the authority to halt, conduct, or direct any Work required by this Settlement, or to direct any other response action undertaken at the Site. Absence of the RPM from the Property is not cause for stoppage of Work unless specifically directed by the RPM.

34. CDPHE has designated Kyle Sandor of the Hazardous Materials and Waste Management Division as the State Project Manager. CDPHE has the right to change its designated State Project Manager. All deliverables, notices, notifications, proposals, reports, and requests specified in this Settlement must be in writing, unless otherwise specified, and be submitted by email to Kyle Sandor at Kyle.Sandor@state.co.us.

VII. RESPONSE ACTIONS TO BE PERFORMED

35. Purchaser shall perform, at a minimum, all actions necessary to implement the Work Plan. The actions to be implemented generally include, but are not limited to, the following: 1) modification and operation of the LFGES; 2) landfill gas and groundwater monitoring; 3) maintenance of landfill cover, fencing, and signage; and 4) implementation, maintenance, monitoring, and reporting on Institutional Controls, which Institutional Controls shall require the installation and operation of vapor intrusion mitigation systems in structures constructed on the Site.

36. For any regulation or guidance referenced in the Settlement, the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance. Such modifications, amendments, or replacements apply to the Work only after Purchaser receives notification from EPA of the modification, amendment, or replacement.

37. **Submission and Review of Deliverables**

a. **General Requirements for Deliverables**

(1) Except as otherwise provided in this Settlement, Purchaser shall direct all deliverables required by this Settlement and the attached Work Plan to the EPA RPM (Sai Appaji, Remedial Program Manager, Appaji.Sairam@epa.gov) and the CDPHE Project Manager (Kyle Sandor, Project Manager, Kyle.Sandor@state.co.us). Purchaser shall submit all deliverables required by this Settlement and the attached Work Plan to EPA and the State in accordance with the schedule set forth in such plan.

(2) Purchaser shall submit all deliverables in electronic form. Technical specifications for sampling and monitoring data and spatial data are addressed in Paragraph 37.b. Purchaser shall submit all other deliverables to EPA and the State in the form specified by the RPM. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5 x 11 inches, Purchaser shall also provide EPA and the State with paper copies of such exhibits.

b. **Technical Specifications for Deliverables**

(1) Sampling and monitoring data should be submitted in standard Regional Electronic Data Deliverable (EDD) format. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.

(2) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (a) in the ESRI File Geodatabase format; and (b) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. If applicable, submissions should include the collection method(s). Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be

compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at https://www.epa.gov/geospatial/epa-metadata-editor.

(3) Each file must include an attribute name for each Site unit or sub-unit submitted. Consult https://www.epa.gov/geospatial/geospatial-policies-and-standards for any further available guidance on attribute identification and naming.

(4) Spatial data submitted by Purchaser does not, and is not intended to, define the boundaries of the Site.

c. **Review and Incorporation of Deliverables.** Following a consultation process with the State and, unless otherwise provided, EPA will approve, disapprove, require revisions to, or modify deliverables in whole or in part that are submitted by Purchaser under this Settlement. If EPA requires revisions, EPA will provide a deadline for the resubmission, and Purchaser shall submit the revised deliverable by the required deadline. Once approved or approved with modifications, Purchaser shall commence implementation as required by the deliverable, and the deliverable will be incorporated into and fully enforceable under this Settlement. Purchaser shall not commence or perform any Work except in conformance with the terms of this Settlement.

d. Purchaser may seek subsequent modifications to approved deliverables in accordance with Paragraph 117.

38. **Health and Safety Plan.** The Health and Safety Plan ("HSP") is attached as Appendix 6. Purchaser shall implement the plan during the pendency of the response action.

39. **Quality Assurance, Sampling, and Data Analysis**

a. Purchaser shall use quality assurance, quality control, and other technical activities and chain of custody procedures for all samples consistent with "EPA Requirements for Quality Assurance Project Plans (QA/R5)" EPA/240/B-01/003 (March 2001, reissue notice May 2006) (https://www.epa.gov/quality/epa-qar-5-epa-requirements-quality-assurance-project-plans), "Guidance for Quality Assurance Project Plans (QA/G-5)" EPA/240/R-02/009 (December 2002) (https://www.epa.gov/quality/guidance-quality-assurance-project-plans-epa-qag-5), and "Uniform Federal Policy for Quality Assurance Project Plans," Parts 1-3, EPA-50-B-04-900A-900C, DOD-DTIC-ADA-427785 (March 2005).

b. **Sampling and Analysis Plan**. In accordance with requirements and schedule set forth in the Work Plan, Purchaser shall submit a Sampling and Analysis Plan to EPA and the State for review and EPA approval in accordance with Paragraph 37. This plan must consist of a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP) that is consistent with the Work Plan, the NCP and applicable guidance documents, including, but not limited to, "Guidance for Quality Assurance Project Plans (QA/G-5)" EPA/240/R-02/009

(December 2002) (https://www.epa.gov/quality/guidance-quality-assurance-project-plans-epa-qag-5), "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" EPA 240/B-01/003 (March 2001, reissue notice May 2006) (https://www.epa.gov/quality/epa-qar-5-epa-requirements-quality-assurance-project-plans), and "Uniform Federal Policy for Quality Assurance Project Plans," Parts 1-3, EPA-50-B-04-900A-900C, DOD-DTIC-ADA-427785 (March 2005).

c. Purchaser shall ensure that EPA and State personnel and their authorized representatives are allowed access at reasonable times to all laboratories used by Purchaser in implementing this Settlement. In addition, Purchaser shall ensure that such laboratories analyze all samples submitted by EPA and the State pursuant to the QAPP for quality assurance, quality control, and technical activities that will satisfy the stated performance criteria as specified in the QAPP and that sampling and field activities are conducted in accordance with the Agency's "EPA QA Field Activities Procedure," CIO 2105-P-02.1 (9/23/2014) available at https://www.epa.gov/irmpoli8/epa-qa-field-activities-procedures. Purchaser shall ensure that the laboratories they utilize for the analysis of samples taken pursuant to this Settlement meet the competency requirements set forth in EPA's "Policy to Assure Competency of Laboratories, Field Sampling, and Other Organizations Generating Environmental Measurement Data under Agency-Funded Acquisitions" available at https://www.epa.gov/measurements/documents-about-measurement-competency-under-acquisition-agreements and that the laboratories perform all analyses according to accepted EPA methods. Accepted EPA methods consist of, but are not limited to, methods that are documented in the EPA's Contract Laboratory Program (https://www.epa.gov/clp), SW 846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (https://www.epa.gov/hw-sw846/sw-846-compendium), "Standard Methods for the Examination of Water and Wastewater" (https://www.standardmethods.org/), 40 C.F.R. Part 136, "Air Toxics - Monitoring Methods" (https://www3.epa.gov/ttnamti1/airtox.html).

d. However, upon approval by EPA, Purchaser may use other appropriate analytical method(s), as long as (i) quality assurance/quality control (QA/QC) criteria are contained in the method(s) and the method(s) are included in the QAPP, (ii) the analytical method(s) are at least as stringent as the methods listed above, and (iii) the method(s) have been approved for use by a nationally recognized organization responsible for verification and publication of analytical methods, e.g., EPA, American Society for Testing and Materials (ASTM), National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA). Purchaser shall ensure that all laboratories it uses for analysis of samples taken pursuant to this Settlement have a documented Quality System that complies with ASQ/ANSI E4:2014 "Quality management systems for environmental information and technology programs - Requirements with guidance for use" (American Society for Quality, February 2014), and "EPA Requirements for Quality Management Plans (QA/R-2)" EPA/240/B-01/002 (March 2001, reissue notice May 2006) (https://www.epa.gov/quality/epa-qar-2-epa-requirements-quality-management-plans), or equivalent documentation as determined by EPA. EPA may consider Environmental Response Laboratory Network (ERLN) laboratories, laboratories accredited under the National Environmental Laboratory Accreditation Program (NELAP), or laboratories that meet International Standardization Organization (ISO 17025) standards or other nationally recognized programs as meeting the Quality System requirements. Purchaser shall ensure that all field methodologies utilized in collecting samples for subsequent

analysis pursuant to this Settlement are conducted in accordance with the procedures set forth in the QAPP approved by EPA.

e. Upon request, Purchaser shall provide split or duplicate samples to EPA or their State or their authorized representatives. Purchaser shall notify EPA and the State not less than ten (10) days in advance of any sample collection activity unless shorter notice is agreed to by EPA. In addition, EPA and the State have the right to take any additional samples that EPA or the State deem necessary. Upon request, EPA and the State will provide to Purchaser split or duplicate samples of any samples it takes as part of EPA's or the State's oversight of Purchaser's implementation of the Work.

f. Purchaser shall submit to EPA and the State the results of all sampling and/or tests or other data obtained or generated by or on behalf of Purchaser with respect to the Property and/or the implementation of this Settlement.

g. Purchaser waives any objections to any data gathered, generated, or evaluated by EPA, the State, or Purchaser in the performance or oversight of the Work that has been verified according to the QA/QC procedures required by the Settlement or any EPA-approved Work Plans or Sampling and Analysis Plans. If Purchaser objects to any other data relating to the Work, Purchaser shall submit to EPA and the State a report that specifically identifies and explains its objections, describes the acceptable uses of the data, if any, and identifies any limitations to the use of the data. The report must be submitted to EPA and the State within fifteen (15) days after the progress report containing the data.

40. **Progress Reports.** Purchaser shall submit a written progress report to EPA and the State concerning actions undertaken pursuant to this Settlement on at a frequency set out in the Work Plan, or as otherwise requested by EPA, from the Effective Date. These reports must describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

41. **Material Management Plan.** Purchaser shall comply with the approved Materials Management Plan ("MMP"), attached as Appendix 7, and any amendment thereto for handling any contaminated material removal from or handled at the Property.

VIII. PROPERTY REQUIREMENTS

42. **Notices.** Purchaser shall provide all legally required notices with respect to the discovery or release of any hazardous substance at the Property that occurs after the Effective Date.

43. **Access, Appropriate Care, and Non-Interference.** Commencing on the Effective Date, Purchaser shall: (1) provide EPA, the State, and their representatives, including contractors, and subcontractors, with full cooperation, assistance, and access to the Property, and to any other property owned or controlled by Purchaser that is part of the Site, at all reasonable times to conduct any activity regarding the Settlement and to any other persons that are

authorized to conduct response actions at the Property, including those activities listed in Paragraph 43.a (Access Requirements); (2) exercise appropriate care with respect to hazardous substances found at the Property as described in Paragraph 43.b (Appropriate Care), and (3) refrain from using such Property in any manner that EPA determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Material, or interfere with or adversely affect the implementation, integrity, or protectiveness of the remedy, including restrictions in Paragraph 43.c (Land, Water, and Other Resource Use Restrictions). To the extent practicable, EPA, the State, and their representatives shall provide advance notice to Purchaser of the times they plan to access the Property.

a. **Access Requirements.** The following is a non-exclusive list of activities for which access to the Property is required pursuant to this Settlement:

(1) Monitoring the Work;

(2) Verifying any data or information submitted to the United States or the State;

(3) Conducting investigations regarding contamination at or near the Property;

(4) Obtaining samples;

(5) Assessing the need for, planning, implementing, or monitoring response actions;

(6) Assessing implementation of quality assurance and quality control practices as defined in the approved quality assurance quality control plan as provided in the Work Plan and/or as defined in the approved SAP;

(7) Implementing the Work pursuant to the conditions set forth in Paragraph 92 (Work Takeover);

(8) Implementing a response action by persons performing under EPA oversight;

(9) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Purchaser or its agents consistent with Section IX (Access to Information);

(10) Assessing Purchaser's compliance with the Settlement;

(11) Determining whether the Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Settlement or an EPA decision document for the Site;

(12) Implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions and any Institutional Controls regarding the Property.

b. **Appropriate Care.** Purchaser shall take reasonable steps to stop any continuing releases; prevent any threatened future releases; and prevent or limit human, environmental or natural resource exposure to any previously released hazardous substance.

c. **Land, Water, or Other Resource Use Restrictions.** Purchaser shall remain in compliance with any land use restrictions, including Institutional Controls associated with the Property and any later revised or amended Institutional Controls, established in connection with any response action at the Property; implement, maintain, monitor, and report on Institutional Controls; and not impede the effectiveness or integrity of any Institutional Control employed at the Property in connection with a response action.

44. **Notice to Successors-in-Title.** Purchaser shall, prior to entering into a contract to Transfer the Property or any part of the Property, or sixty (60) days prior to transferring the Property or any part of the Property, whichever is earlier:

a. Notify the proposed transferee that EPA has selected a remedy regarding the Site, that the Purchaser has entered into an Administrative Settlement Agreement requiring implementation of certain response actions and compliance with the property requirements in Section VIII (identifying the name, CERCLA docket number, and the Effective Date of this Settlement); and

b. Notify EPA and the State of the name and address of the proposed transferee, and provide EPA and the State with a copy of the above notice that it provided to the proposed transferee.

45. For so long as Purchaser is an owner or operator of the Property or any part thereof, Purchaser shall include in any contract or other agreement that any transferees, successors in interest, and any lessees, sublessees and other parties with rights to use the Property or any part thereof, terms requiring that such parties provide access and cooperation to EPA, its authorized officers, employees, representatives, and all other persons performing response actions under EPA oversight. Purchaser shall further include in any such contract or agreement with any transferees, successors in interest, and any lessees, sublessees, and other parties with rights to use the Property or any part thereof, terms requiring such parties to implement and comply with any land use restrictions and Institutional Controls on the Property in connection with any response action, and not contest EPA's authority to enforce any land use restrictions and Institutional Controls on the Property or any part thereof. EPA and the State shall be designated as third-party beneficiaries with the right to enforce such terms.

46. Upon Transfer of the Property or any part of the Property, Purchaser shall include in any contract or agreement for such Transfer terms requiring that each successor in title, grantee, transferee or other holder of an interest in the Property or any part of the Property shall provide access and cooperation to EPA and the State, as well as their authorized officers, employees, representatives, and all other persons performing response actions under EPA and

State oversight. Purchaser shall further include in any contract or agreement for such Transfer terms requiring that each successor in title, grantee, transferee or other holder of an interest in the Property or any part of the Property shall implement and comply with any land use restrictions and Institutional Controls on the Property in connection with a response action and not contest EPA or the State's authority to enforce any land use restrictions and Institutional Controls on the Property or any part of the Property. EPA and the State shall be designated as third-party beneficiaries with the right to enforce such terms.

47. Purchaser shall provide a copy of this Settlement to any current lessee, sublessee, and other party with rights to use the Property or any part thereof as of the Effective Date.

48. Notwithstanding any provision of this Settlement, EPA and the State retain all of its access authorities and rights, as well as all of its rights to require land, water or other resource use restrictions and Institutional Controls, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

IX. ACCESS TO INFORMATION

49. Purchaser shall comply, as required by law, with any authorized request for information or administrative subpoena issued by EPA or the State.

50. Purchaser shall provide to EPA and the State, upon request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as "Records") within Purchaser's possession or control or that of its contractors or agents relating to activities at the Site or to the implementation of this Settlement, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the Work. Purchaser shall also make available to EPA and the State, for purposes of investigation, information gathering, or testimony, its employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

51. **Privileged and Protected Claims**

a. Purchaser may assert all or part of a Record requested by EPA or the State is privileged or protected as provided under federal or state law, in lieu of providing the Record, provided Purchaser complies with Paragraph 51.b, and except as provided in Paragraph 51.c.

b. If Purchaser asserts such a privilege or protection, it shall provide EPA and the State with the following information regarding such Record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each recipient; a general description of the Record's subject matter; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a Record, Purchaser shall provide the Record to EPA and the State in redacted form to mask the privileged or protected portion only. Purchaser shall retain all Records that it claims to be privileged or protected until EPA and the State have had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in Purchaser's favor.

c. Purchaser may make no claim of privilege or protection regarding: (1) any data regarding the Site, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological, or engineering data, or the portion of any other Record that evidences conditions at or around the Site; or (2) the portion of any Record that Purchaser is required to create or generate pursuant to this Settlement.

52. **Business Confidential Claims.** Purchaser may assert that all or part of a Record provided to EPA and the State under this Section or Section X (Record Retention) is business confidential to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Purchaser shall segregate and clearly identify all Records or parts thereof submitted under this Settlement for which Purchaser asserts business confidentiality claims. Records that Purchaser claims to be confidential business information will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to EPA and the State, or if EPA or the State has notified Purchaser that the Records are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such Records without further notice to Purchaser.

53. If relevant to the proceeding, the Parties agree that validated sampling or monitoring data generated in accordance with this Settlement and reviewed and approved by EPA shall be admissible as evidence, without objection, in any proceeding under this Settlement.

54. Notwithstanding any provision of this Settlement, EPA and the State retain all their information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

X. RECORD RETENTION

55. For a period of ten (10) years following completion of the Work, unless EPA agrees in writing to a shorter time period, Purchaser shall preserve all documents and information in Purchaser's possession or control and relating to the Work and any hazardous substances, pollutants or contaminants found on or released from the Property. At the conclusion of the document retention period, Purchaser shall notify EPA and the State at least ninety (90) days prior to the destruction of any such records, and upon request by EPA and/or the State, except as provided in Paragraph 51 (Privileged and Protected Claims), Purchaser shall deliver any such records to EPA and/or the State. These record retention requirements apply regardless of any corporate retention policy to the contrary and is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004.

XI. COMPLIANCE WITH OTHER LAWS

56. Nothing in this Settlement limits Purchaser's obligations to comply with the requirements of all applicable state and federal laws and regulations, except as provided in Section 121(e)(1) of CERCLA, 42 U.S.C. § 9621(e)(1), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-Site actions required pursuant to this Settlement shall, to the extent practicable, as determined by EPA, considering the exigencies

of the situation, attain applicable or relevant and appropriate requirements (ARARs) under federal environmental or state environmental or facility siting laws.

57. No local, state, or federal permit shall be required for any portion of the Work conducted entirely on-Site (i.e., within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work), including studies, if the action is selected and carried out in compliance with Section 121 of CERCLA, 42 U.S.C. § 9621. Where any portion of the Work that is not on-Site requires a federal or state permit or approval, Purchaser shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals. Purchaser may seek relief under the provisions of Section XV (Force Majeure) for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval required for the Work, provided that it has submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals. This Settlement is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

XII. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

58. **Emergency Response.** If any event occurs during performance of the Work that causes or threatens to cause a release of Waste Material on, at, or from the Property that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, Purchaser shall immediately take all appropriate action to prevent, abate, or minimize such release or threat of release. Purchaser shall take these actions in accordance with all applicable provisions of this Settlement, including, but not limited to, the Health and Safety Plan. Purchaser shall also immediately notify both the RPM or, in the event of his/her unavailability, the Regional Duty Officer at (303) 293-1788 of the incident or Property conditions, and the State's Project Manager. If Purchaser fails to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Purchaser shall reimburse EPA for all costs of such response action not inconsistent with the NCP pursuant to Section XIII (Payment of Response Costs).

59. **Release Reporting.** Upon the occurrence of any event during performance of the Work that Purchaser is required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004, Purchaser shall immediately orally notify the RPM or, in the event of his/her unavailability, the Regional Duty Officer at (303) 293-1788, the National Response Center at (800) 424-8802, and the State Project Manager. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103 of CERCLA, 42 U.S.C. § 9603, and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004.

60. For any event covered under this Section, Purchaser shall submit a written report to EPA and the State within seven (7) days after the onset of such event, setting forth the action or event that occurred and the measures taken, and to be taken, to mitigate any release or threat of release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release or threat of release.

XIII. PAYMENT OF RESPONSE COSTS

61. **Payment of Response Costs.** Purchaser shall pay to EPA all Response Costs and to the State all State Response Costs not inconsistent with the NCP.

62. **EPA Response Costs**:

a. On a periodic basis, EPA will send Purchaser a bill requiring payment of Response Costs that includes a standard EPA cost report, which includes direct and indirect costs incurred by EPA, its contractors, subcontractors, and the United States Department of Justice. Purchaser shall make all payments within thirty (30) days of Purchaser's receipt of each bill requiring payment in accordance with Paragraph c, except as otherwise provided in Paragraph 65 (Contesting Response Costs).

b. EPA will send Purchaser an electronic billing notification to the following email address:

bjais@ca-ventures.com

with copies to:

jtrinkle@ca-ventures.com and lynx.chan@lcdevcon.com.

c. **Payment Instructions.** Purchaser shall make all payments at https://www.pay.gov, in accordance with the following payment instructions: enter "sfo 1.1" in the search field to access EPA's Miscellaneous Payments Form - Cincinnati Finance Center. Complete the form including the Site Name, CERCLA docket number and Site/Spill ID Number 08-14. Purchaser shall send to EPA in accordance with Paragraph 123, a notice of this payment including these references.

d. **Deposit of Payments.** The total amount to be paid by Purchaser pursuant to Section XIII (Payment of Response Costs) may be deposited by EPA in the Sand Creek Special Account to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund, provided, however, that EPA may deposit a payment directly into the EPA Hazardous Substance Superfund if, at the time the payment is received, EPA estimates that the Sand Creek Special Account balance is sufficient to address currently anticipated future response actions to be conducted or financed by EPA at or in connection with the Site. Any decision by EPA to deposit a payment directly into the EPA Hazardous Substance Superfund for this reason shall not be subject to challenge by Purchaser pursuant to the dispute resolution provisions of this Settlement or in any other forum.

63. **State Response Costs:**

a. **Payment of State Response Costs.** On a periodic basis, the State will send Purchaser a bill requiring payment of State Response Costs. Purchaser shall make all payments within thirty (30) days of Purchaser's receipt of each bill, requiring payment in

accordance with Paragraph 63.b, except as otherwise provided in Paragraph 65 (Contesting Response Costs).

b. **State Payment Instructions.** Payment shall be made by certified or cashier's check drawn to the order of "State of Colorado, Treasurer, For Deposit in the Hazardous Substance Response Fund" and sent to:

Budget Officer
Colorado Department of Public Health and Environment
Hazardous Materials and Waste Management Division
4300 Cherry Creek Drive South
Denver, CO 80246

64. **Interest.** If any payment is not made by the date required, Purchaser shall pay Interest on the unpaid balance. The Interest on Response Costs and State Response Costs under Section XIII (Payment of Response Costs) shall begin to accrue on the date of the bill. The Interest shall accrue through the date of Purchaser's payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States and/or the State by virtue of Purchaser's failure to make timely payments under this Section, including but not limited to, payments of stipulated penalties pursuant to Section XVI (Stipulated Penalties).

65. **Contesting Response Costs.** Purchaser may initiate the procedures of Section XIV (Dispute Resolution) regarding payment of any Response Costs or State Response Costs billed under Section XIII (Payment of Response Costs**)** if it determines that EPA or the State has made a mathematical error or included a cost item that is not within the definition of Response Costs or State Response Costs, or if it believes EPA or the State incurred excess costs as a direct result of an EPA action or State action that was inconsistent with a specific provision or provisions of the NCP. To initiate such dispute, Purchaser shall submit a Notice of Dispute in writing to the RPM or State Project Manager within thirty (30) days after receipt of the bill. Any such Notice of Dispute shall specifically identify the contested Response Costs or State Response Costs and the respective basis for objection. If Purchaser submits a Notice of Dispute, Purchaser shall within the thirty (30)-day period, also as a requirement for initiating the dispute, (a) pay all uncontested Response Costs to EPA or State Response Costs to the State in the manner described in Paragraph 62.c, and (b) establish, in a duly chartered bank or trust company, an interest-bearing escrow account that is insured by the Federal Deposit Insurance Corporation (FDIC) and remit to that escrow account funds equivalent to the amount of the contested Response Costs or State Response Costs. Purchaser shall send to the RPM or State Project Manager a copy of the transmittal letter and check paying the uncontested Response Costs or State Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. If EPA or the State prevails in the dispute, within five (5) days after the resolution of the dispute, the escrow agent shall release the sums due (with accrued interest) to EPA or the State in the manner described in Paragraphs 62.c or 63.b. If Purchaser prevails concerning any aspect of the contested costs, the escrow agent shall release that portion of the costs (plus associated accrued interest) for which it did not prevail to EPA or the State in

the manner described in Paragraphs 62.c or 63.b. Purchaser shall be disbursed any balance of the escrow account. The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XIV (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes under Purchasers' obligation to reimburse EPA for its Response Costs and the State for its State Response Costs.

XIV. DISPUTE RESOLUTION

66. Unless otherwise expressly provided for in this Settlement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Settlement.

67. **EPA Dispute Resolution.** EPA and Purchaser shall attempt to resolve any disagreements concerning this Settlement expeditiously and informally. If EPA contends that Purchaser is in violation of this Settlement, EPA will notify Purchaser in writing, setting forth the basis for its position. Purchaser may dispute EPA's position pursuant to Paragraph 67.a (Informal Dispute Resolution).

a. **Informal Dispute Resolution.** If Purchaser objects to any EPA action taken pursuant to this Settlement, including billings for Response Costs, Purchaser shall send the RPM and EPA counsel, with a copy to DOJ, a written Notice of Dispute describing the objection(s) within ten (10) days after such action. EPA and Purchaser shall have thirty (30) days from EPA's receipt of Purchaser's Notice of Dispute to resolve the dispute through informal negotiations (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of EPA. Any agreement reached by EPA and Purchaser pursuant to this Section shall be in writing and shall, upon signature by EPA and Purchaser, be incorporated into and becomes an enforceable part of this Settlement.

b. **Formal Dispute Resolution.** If EPA and Purchaser are unable to reach an agreement within the Negotiation Period, Purchaser shall, within twenty (20) days after the end of the Negotiation Period, submit a statement of position to the RPM and EPA counsel. EPA may, within twenty (20) days thereafter, submit a statement of position. Thereafter, an EPA management official at the Division Director level or higher will issue a written decision on the dispute to Purchaser, with a copy to DOJ. EPA's decision will be incorporated into and become an enforceable part of this Settlement. Purchaser shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs.

c. Except as provided in Paragraph 65 (Contesting Response Costs) or as agreed by EPA, the invocation of formal dispute resolution procedures under this Section does not extend, postpone, or affect in any way any obligation of Purchaser under this Settlement. Except as provided in Paragraph 78, stipulated penalties with respect to the disputed matter shall continue to accrue, but payment shall be stayed pending resolution of the dispute. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Settlement. If Purchaser does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XVI (Stipulated Penalties).

68. **State Dispute Resolution.** The State and Purchaser shall attempt to resolve any disagreement concerning this Settlement expeditiously and informally. The Parties anticipate that the only potential dispute that the State and Purchaser may have are disputes over billing for State Response Costs. If Purchaser objects to a billing for State Response Costs, Purchaser shall send the State a written Notice of Dispute in accordance with Paragraph 65. If the State contends that Purchaser is in violation of this Settlement with respect to payment of State Response Costs, the State will notify Purchaser in writing, settling forth the basis for its position. Purchaser may dispute State's position pursuant to Paragraphs 68.a and b.

a. **Informal Dispute Resolution.** If Purchaser objects to a State determination that it is in violation of the requirement to pay State Response Costs, Purchaser shall send the Hazardous Materials and Waste Management Project Manager and State counsel in the Colorado Attorney General's Office a written Notice of Dispute describing the objection(s) within ten (10) days after such action. The State and Purchaser shall have thirty (30) days from the State's receipt of Purchaser's Notice of Dispute to resolve the dispute through informal negotiations (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of the State. Any agreement reached by the State and Purchaser pursuant to this Section shall be in writing and shall, upon signature by the State and Purchaser, be incorporated into and becomes an enforceable part of this Settlement.

b. **Formal Dispute Resolution.** If the State and Purchaser are unable to reach an agreement within the Negotiation Period, Purchaser shall, within twenty (20) days after the end of the Negotiation Period, submit a statement of position to the Hazardous Materials and Waste Management Project Manager and State counsel in the Colorado Attorney General's Office. The State may, within twenty (20) days thereafter, submit a statement of position. Thereafter, the Hazardous Materials and Waste Management Division Director will issue a written decision on the dispute to Purchaser, with a copy to State counsel in the Colorado Attorney General's Office. The State's decision will be incorporated into and become an enforceable part of this Settlement. Purchaser shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with the State's decision, whichever occurs.

XV. FORCE MAJEURE

69. "Force Majeure," for purposes of this Settlement, is defined as any event arising from causes beyond the control of Purchaser, of any entity controlled by Purchaser, or of Purchaser's contractors that delays or prevents the performance of any obligation under this Settlement despite Purchaser's best efforts to fulfill the obligation. Given the need to protect public health and welfare and the environment, the requirement that Purchaser exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure and best efforts to address the effects of any potential force majeure (a) as it is occurring and (b) following the potential force majeure such that the delay and any adverse effects of the delay are minimized to the greatest extent possible. "Force majeure" does not include financial inability to complete the Work, increased cost of performance, or a failure to attain performance standards set forth in the ROD.

70. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement for which Purchaser intends or may intend to assert a claim of force majeure, Purchaser shall notify EPA's RPM orally or, in his or her absence, the Director of the Superfund and Emergency Management Division, EPA Region 8, and the Hazardous Materials and Waste Management Division Program Manager within eight (8) days of when Purchaser first knew that the event might cause a delay. Within eight (8) days thereafter of notice given, Purchaser shall provide in writing to EPA and the State an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Purchaser's rationale for attributing such delay to a force majeure; and a statement as to whether, in the opinion of Purchaser, such event may cause or contribute to an endangerment to public health or welfare, or the environment. Purchaser shall include with any notice all available documentation supporting its claim that the delay was attributable to a force majeure. Purchaser shall be deemed to know of any circumstance of which Purchaser, any entity controlled by Purchaser, or Purchaser's contractors knew or should have known. Failure to comply with the above requirements regarding an event shall preclude Purchaser from asserting any claim of force majeure regarding that event, provided, however, that if EPA, despite the late or incomplete notice, and after a consultation process with the State, is able to assess to its satisfaction whether the event is a force majeure under Paragraph 71 and whether Purchaser has exercised best efforts under Paragraph 69, EPA may, in its unreviewable discretion, excuse in writing Purchaser's failure to submit timely or complete notices under this Paragraph.

71. If EPA agrees that the delay or anticipated delay is attributable to a force majeure, the time for performance of the obligations under this Settlement that are affected by the force majeure will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure, EPA will notify Purchaser in writing of its decision. If EPA agrees that the delay is attributable to a force majeure, EPA will notify Purchaser in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure.

72. If Purchaser elects to invoke the dispute resolution procedures set forth in Section XIV (Dispute Resolution), it shall do so no later than fifteen (15) days after receipt of EPA's notice. In any such proceeding, Purchaser shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Purchaser complied with the requirements of Paragraphs 69 and 70. If Purchaser carries this burden, the delay at issue shall be deemed not to be a violation by Purchaser of the affected obligation of this Settlement identified to EPA.

73. The failure by EPA to timely complete any obligation under the Settlement is not a violation of the Settlement, provided, however, that if such failure prevents Purchaser from meeting one or more deadlines under the Settlement, Purchaser may seek relief under this Section.

XVI. STIPULATED PENALTIES

74. Purchaser shall be liable to the United States for stipulated penalties in the amounts set forth in Paragraphs 75.a and 76 for failure to comply with the obligations specified in Paragraphs 75.b and 76, unless excused under Section XV (Force Majeure). "Comply" as used in the previous sentence include compliance by Purchaser with all applicable requirements of this Settlement, within the deadlines established under this Settlement.

75. **Stipulated Penalty Amounts – Payments, Major Deliverables, Financial Assurance, and Other Milestones**

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 75.b:

Penalty per Violation per Day	Period of Noncompliance
$800	1st through 14th day
$1,200	15th through 30th day
$3,000	31st day and beyond

b. **Obligations to EPA**

(1) Payment of any amount due to EPA under Section XIII (Payment of Response Costs).

(2) Establishment and maintenance of financial assurance in accordance with Section XXV (Financial Assurance).

(3) Establishment of an escrow account to hold any disputed Future Response Costs under Paragraph 65 (Contesting Response Costs).

(4) Failure to timely submit adequate Landfill Gas Extraction System Construction Completion Report.

(5) Failure to timely submit adequate Methane Mitigation System Construction Completion Report(s).

(6) Failure to timely submit adequate Operations & Maintenance Reports.

c. **Obligations to the State**

(1) Payment of any amount due to the State under Section XIII (Payment of Response Costs).

76. **Stipulated Penalty Amounts – Other Deliverables.** The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate deliverables

pursuant to this Settlement, other than those specified in Paragraph 75.b. (including, but not limited to, Well Abandonment Reports and Monthly Progress Reports):

Penalty per Violation per Day	Period of Noncompliance
$600	1st through 14th day
$1,000	15th through 30th day
$2,250	31st day and beyond

77. If EPA assumes performance of a portion or all of the Work pursuant to Paragraph 92 (Work Takeover), Purchaser shall be liable for a stipulated penalty in the amount of $125,000. Stipulated penalties under this Paragraph are in addition to the remedies available to EPA under Paragraphs 92 (Work Takeover) and 113 (Access to Financial Assurance).

78. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. Penalties shall continue to accrue during any dispute resolution period and shall be paid within fifteen (15) days after the agreement or the receipt of EPA's or the State's decision or order. However, stipulated penalties shall not accrue: (a) with respect to a deficient submission under Paragraph 37.c (Review and Incorporation of Deliverables), during the period, if any, beginning on the 31st day after EPA's or the State's receipt of such submission until the date that EPA or the State notify Purchaser of any deficiency; and (b) with respect to a decision by the EPA management official at the Division Director level or higher, under Paragraph 67.b (Formal Dispute Resolution), or the State, under Paragraph 68.b (Formal Dispute Resolution), during the period, if any, beginning on the 21st day after the Negotiation Period begins until the date that the EPA management official or the State issues a final decision regarding such dispute. Nothing in this Settlement shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement.

79. Following an EPA or State determination that Purchaser has failed to comply with a requirement of this Settlement, if pursuing stipulated penalties, EPA or the State shall give Purchaser written notification of the failure and describe the noncompliance. EPA or the State may send Purchaser a written demand for payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of the date EPA or the State has notified Purchaser of a violation or provided a demand for payment.

80. All penalties accruing under this Section shall be due and payable to EPA or the State within thirty (30) days of Purchaser's receipt from EPA or the State of a demand for payment of the penalties, unless Purchaser invokes the Dispute Resolution procedures under Section XIV (Dispute Resolution) within the thirty (30)-day period. Purchaser shall make all payments and shall send notice of such payments in accordance with the procedures under Paragraphs 62.c (Payment Instructions) or 63.b (State Payment Instructions). Purchaser should indicate in the comment field on the https://www.pay.gov payment form that the payment is for stipulated penalties.

81. If Purchaser fails to pay stipulated penalties when due, Purchaser shall pay Interest on the unpaid stipulated penalties as follows: (a) if Purchaser has timely invoked dispute resolution such that the obligation to pay stipulated penalties has been stayed pending the outcome of dispute resolution, Interest shall accrue from the date stipulated penalties are due pursuant to Paragraph 78 until the date of payment; and (b) if Purchaser fails to timely invoke dispute resolution, Interest shall accrue from the date of demand under Paragraph 80 until the date of payment. If Purchaser fails to pay stipulated penalties and Interest when due, the United States may institute proceedings to collect the penalties and Interest.

82. The payment of penalties and Interest, if any, shall not alter in any way Purchaser's obligation to complete the performance of the Work required under this Settlement.

83. Nothing in this Settlement shall be construed as prohibiting, altering, or in any way limiting the ability of the United States to seek any other remedies or sanctions available by virtue of Purchaser's violation of this Settlement or of the statutes and regulations upon which it is based including, but not limited to, penalties pursuant to Section 106(b) of CERCLA, 42 U.S.C. § 9606(b), provided, however, that the United States shall not seek civil penalties pursuant to Section 106(b) for any violation for which a stipulated penalty is provided herein, except in the case of a willful violation of this Settlement or in the event that EPA assumes performance of a portion or all of the Work pursuant to Section XIX, (Reservations of Rights by United States), Paragraph 92.

84. Notwithstanding any other provision of this Section, the United States and the State may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Settlement.

XVII. CERTIFICATION

85. By entering into this Settlement, Purchaser certifies under penalty of perjury that to the best of its knowledge and belief it has fully and accurately disclosed to EPA and the State all information known to Purchaser and all information in the possession or control of its members, managers, officers, directors, employees, contractors and agents which relates in any way to any Existing Contamination or any past or potential future release of hazardous substances, pollutants or contaminants at or from the Site and to its qualification for this Settlement. Purchaser also certifies that to the best of its knowledge and belief it has not caused or contributed to a release or threat of release of hazardous substances, pollutants or contaminants at the Site.

XVIII. COVENANTS BY UNITED STATES AND THE STATE

86. Except as provided in Section XIX (Reservations of Rights by United States and the State), the United States covenants not to sue or to take administrative action against Purchaser pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), and the State covenants not to sue or take administrative action against Purchaser pursuant to 107(a) of CERCLA, 42 U.S.C. § 9607(a), for Existing Contamination, the Work, and payments under Section XIII (Payment of Response Costs). These covenants shall take effect upon the Effective Date. These covenants are conditioned upon the complete and satisfactory performance by

Purchaser of its obligations under this Settlement. These covenants are also conditioned upon the veracity of the information provided to EPA and the State by Purchaser relating to Purchaser's involvement with the Site and the certification made by Purchaser in Paragraph 85.

87. Except with respect to a future Transfer, pursuant to Paragraph 8 of this Settlement, these covenants extend only to Purchaser and do not extend to any other person.

88. Nothing in this Settlement constitutes a covenant not to sue or not to take action or otherwise limits the ability of the United States, EPA, or the State to seek or obtain further relief from Purchaser if the information provided to EPA or the State by Purchaser relating to Purchaser's involvement with the Site or the certification made by Purchaser in Paragraph 85 is false or in any material respect inaccurate.

XIX. RESERVATIONS OF RIGHTS BY UNITED STATES AND THE STATE

89. Except as specifically provided in this Settlement, nothing in this Settlement shall limit the power and authority of the United States, EPA, or the State to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, except as specifically provided in this Settlement, nothing in this Settlement shall prevent the United States or the State from seeking legal or equitable relief to enforce the terms of this Settlement or from taking other legal or equitable action as it deems appropriate and necessary.

90. The covenants set forth in Section XVIII (Covenants by United States and the State) do not pertain to any matters other than those expressly identified therein. The United States and the State reserve, and this Settlement is without prejudice to, all rights against Purchaser with respect to all other matters, including, but not limited to:

a. liability for failure by Purchaser to meet a requirement of this Settlement;

b. criminal liability;

c. liability for violations of federal or state law that occur during or after implementation of the Work;

d. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments, which is not impacted by this Settlement;

e. liability resulting from the release or threat of release of hazardous substances, pollutants or contaminants at or in connection with the Site after the Effective Date, not within the definition of Existing Contamination;

f. liability resulting from an act or omission (not including any act or omission completed in compliance with this Settlement) that causes exacerbation of Existing Contamination by Purchaser, its successors, assigns, lessees, or sublessees; and

g. liability arising from the disposal, release or threat of release of Waste Materials outside of the Property, except as provided in clause c of the definition of Existing Contamination.

91. With respect to any claim or cause of action asserted by the United States, Purchaser shall bear the burden of proving that the claim or cause of action, or any part thereof, is attributable solely to Existing Contamination.

92. **Work Takeover**

a. If EPA after consultation with the State determines that Purchaser: (1) has ceased implementation of any portion of the Work; (2) is seriously or repeatedly deficient or late in its performance of the Work; or (3) is implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may issue a written notice ("Work Takeover Notice") to Purchaser. Any Work Takeover Notice issued by EPA (which writing may be electronic) will specify the grounds upon which such notice was issued and will provide Purchaser a period of thirty (30) days within which to remedy the circumstances giving rise to EPA's issuance of such notice.

b. If, after expiration of the thirty (30)-day notice period specified in Paragraph 92.a, Purchaser has not remedied to EPA's satisfaction the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, EPA may at any time thereafter assume the performance of all or any portion(s) of the Work as EPA deems necessary ("Work Takeover"). EPA will notify Purchaser in writing (which writing may be electronic) if EPA determines that implementation of a Work Takeover is warranted under this Paragraph 92.b. Funding of Work Takeover costs is addressed under Paragraph 113 (Access to Financial Assurance).

c. Purchaser may invoke the procedures set forth in Paragraph 67.b (Formal Dispute Resolution) to dispute EPA's implementation of a Work Takeover under Paragraph 92. However, notwithstanding Purchaser's invocation of such dispute resolution procedures, and during the pendency of any such dispute, EPA may in its sole discretion commence and continue a Work Takeover under Paragraph 92 until the earlier of: (1) the date that Purchaser remedies, to EPA's satisfaction, the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice; or (2) the date that a written decision terminating such Work Takeover is rendered in accordance with Paragraph 67.b (Formal Dispute Resolution).

d. Notwithstanding any other provision of this Settlement, EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

XX. COVENANTS BY PURCHASER

93. Purchaser covenants not to sue and agrees not to assert any claims or causes of action against the United States or the State, or their contractors or employees, with respect to Existing Contamination, the Work, payments under Section XIII (Payment of Response Costs), and this Settlement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund through Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claim arising out of response actions, including any claim under the United States Constitution, the Colorado Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, or at common law; or

c. any claim pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, Section 7002(a) of RCRA, 42 U.S.C. § 6972(a), or state law regarding Existing Contamination, the Work, payments under Section XIII (Payment of Response Costs), and this Settlement.

94. These covenants not to sue shall not apply if the United States or the State brings a cause of action or issues an order pursuant to any of the reservations set forth in Section XIX (Reservations of Rights by United States and the State), other than in Paragraph 90.a (liability for failure to meet a requirement of the Settlement), or 90.b (criminal liability), or 90.c (violations of federal or state law during or after implementation of the Work), but only to the extent that Purchaser's claims arise from the same response action, response costs, or damages that the United States or the State is seeking pursuant to the applicable reservation.

95. Nothing in this Settlement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d), or Section 112 of CERCLA, 42 U.S.C. § 9612, or 40 C.F.R. Part 307.

96. Purchaser reserves, and this Settlement is without prejudice to, claims against the United States or the State, subject to the provisions of Chapter 171 of Title 28 of the United States Code, and brought pursuant to any statute other than CERCLA or RCRA and for which the waiver of sovereign immunity is found in a statute other than CERCLA or RCRA, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States or the State, as that term is defined in 28 U.S.C. § 2671, while acting within the scope of his or her office or employment under circumstances where the United States or the State, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, the foregoing shall not include any claim based on EPA's selection of response actions, or the oversight or approval of Purchaser's deliverables or activities.

XXI. OTHER CLAIMS

97. By agreeing to this Settlement, the United States, EPA, and the State assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Purchaser. Neither the United States, EPA, nor the State shall be deemed a party to any contract entered into by Purchaser or its managers, members, directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Settlement.

98. Except as expressly provided in Section XVIII (Covenants by United States and the State) and Section XXII (Effect of Settlement/Contribution), nothing in this Settlement

constitutes a satisfaction of or release from any claim or cause of action against Purchaser or any person not a party to this Settlement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States or the State for costs, damages, and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

99. No action or decision by EPA or the State pursuant to this Settlement gives rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXII. EFFECT OF SETTLEMENT/CONTRIBUTION

100. Nothing in this Settlement creates any rights in, or grants any cause of action to, any person not a Party to this Settlement. Except as provided in Section XX (Covenants by Purchaser), each of the Parties expressly reserves any and all rights (including, but not limited to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 9613), defenses, claims, demands, and causes of action that each Party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto. Nothing herein diminishes the right of the United States or the State, pursuant to Sections 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2) and (3), to pursue any such persons to obtain additional response costs or response actions and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

101. The Parties agree that this Settlement constitutes an administrative settlement pursuant to which Purchaser has, as of the Effective Date, resolved liability to the United States and the State within the meaning of Sections 113(f)(2) and is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for the "matters addressed" in this Settlement. The "matters addressed" in this Settlement are the Work, payments under Section XIII (Payment of Response Costs), and all response actions taken or to be taken and all response costs incurred or to be incurred in connection with Existing Contamination by the United States, the State, or any other person. However, if the United States or the State exercises rights under the reservations in Section XIX (Reservations of Rights by United States and the State), other than in Paragraphs 90.a (claims for failure to meet a requirement of the Settlement), 90.b (criminal liability), or 90.c (violations of federal/state law during or after implementation of the Work), the "matters addressed" in this Settlement will no longer include those response costs or response actions that are within the scope of the exercised reservation.

102. The Parties agree that this Settlement constitutes an administrative settlement pursuant to which Purchaser has, as of the Effective Date, resolved liability to the United States and the State within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

103. Purchaser shall, with respect to any suit or claim brought by it against any party for matters related to this Settlement, notify EPA and the State in writing no later than sixty (60) days prior to the initiation of such suit or claim. Purchaser shall, with respect to any suit or claim brought against it for matters related to this Settlement, notify EPA and the State in writing

within ten (10) days after service of the complaint or claim upon it. In addition, Purchaser shall notify EPA and the State within ten (10) days after service or receipt of any Motion for Summary Judgment and within ten (10) days after receipt of any order from a court setting a case for trial, for matters related to this Settlement.

XXIII. INDEMNIFICATION

104. The United States and the State do not assume any liability by entering into this Settlement or by virtue of any designation of Purchaser as EPA's authorized representatives under Section 104(e) of CERCLA, 42 U.S.C. § 9604(e), and 40 C.F.R. 300.400(d)(3). Purchaser shall indemnify, save, and hold harmless the United States and the State, their officials, agents, employees, contractors, subcontractors, and representatives for or from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Purchaser, its members, managers, officers, directors, employees, agents, contractors, or subcontractors, and any persons acting on Purchaser's behalf or under its control, in carrying out activities pursuant to this Settlement. Further, Purchaser agrees to pay the United States and the State all costs they incur, including but not limited to attorneys' fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States or the State based on negligent or other wrongful acts or omissions of Purchaser, its members, managers, officers, directors, employees, agents, contractors, subcontractors, and any persons acting on its behalf or under its control, in carrying out activities pursuant to this Settlement. The United States and the State shall not be held out as a party to any contract entered into by or on behalf of Purchaser in carrying out activities pursuant to this Settlement. Neither Purchaser nor any such contractor shall be considered an agent of the United States or the State.

105. The United States and the State shall give Purchaser notice of any claim for which the United States or the State plans to seek indemnification pursuant to this Section and shall consult with Purchaser prior to settling such claim.

106. Purchaser covenants not to sue and agrees not to assert any claims or causes of action against the United States or the State for damages or reimbursement or for set-off of any payments made or to be made to the United States or the State, arising from or on account of any contract, agreement, or arrangement between Purchaser and any person for performance of work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Purchaser shall indemnify and hold harmless the United States and the State with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Purchaser and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

XXIV. INSURANCE

107. No later than ten (10) days before commencing any Work at the Property, Purchaser shall secure, and shall maintain commercial general liability insurance with limits of $1 million per occurrence, and automobile liability insurance with limits of liability of $1 million per accident, and umbrella liability insurance with limits of liability of $5 million in excess of the required commercial general liability and automobile liability limits, naming EPA as an additional insured with respect to all liability arising out of the activities performed by or on

behalf of Purchaser pursuant to this Settlement. In addition, for the duration of the Settlement, Purchaser shall provide EPA with certificates of such insurance and a copy of each insurance policy. Purchaser shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. In addition, for the duration of the Settlement, Purchaser shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Purchaser in furtherance of this Settlement. If Purchaser demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in a lesser amount, Purchaser need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. Purchaser shall ensure that all submittals to EPA under this Paragraph identify the Sand Creek Superfund Site, Commerce City, Colorado and the CERCLA docket number for this action.

XXV. FINANCIAL ASSURANCE

108. In order to ensure completion of the Work, Purchaser shall secure financial assurance, initially in the amount of $6,497,000 ("Estimated Cost of the Work"), for the benefit of EPA. The financial assurance must be one or more of the mechanisms listed below, in a form substantially identical to the relevant sample documents available from EPA or under the "Financial Assurance - Settlements" category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/, and satisfactory to EPA. Purchaser may use multiple mechanisms if it is limited to surety bonds guaranteeing payment, letters of credit, trust funds, and/or insurance policies. Without limiting Paragraph 114, the amount of such financial assurance may be reduced to $2,726,000 upon EPA approval of the Final Construction Completion Report for LFGES Modification.

a. A surety bond guaranteeing payment and/or performance of the Work that is issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. An irrevocable letter of credit, payable to or at the direction of EPA, that is issued by an entity that has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a federal or state agency;

c. A trust fund established for the benefit of EPA that is administered by a trustee that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency;

d. A policy of insurance that provides EPA with acceptable rights as a beneficiary thereof and that is issued by an insurance carrier that has the authority to issue insurance policies in the applicable jurisdiction(s) and whose insurance operations are regulated and examined by a federal or state agency;

e. A demonstration by a Purchaser that it meets the financial test criteria of Paragraph 110; or

f. A guarantee to fund or perform the Work executed in favor of EPA by a company: (1) that is a direct or indirect parent company of a Purchaser or has a "substantial business relationship" (as defined in 40 C.F.R. § 264.141(h)) with a Purchaser; and (2) can demonstrate to EPA's satisfaction that it meets the financial test criteria of Paragraph 110.

109. Purchaser has selected, and EPA has found satisfactory, an irrevocable letter of credit as an initial form of financial assurance. Within thirty (30) days after the Effective Date, Purchaser shall secure all executed and/or otherwise finalized mechanisms or other documents consistent with the EPA-approved form of financial assurance and shall submit such mechanisms and documents to the Regional Financial Management Officer at:

Regional Financial Management Officer
Superfund Cost Recovery
Financial Management Unit (MSD-FM-B)
U.S. EPA, Region 8
1595 Wynkoop St.
Denver, CO 80202
Johnson.Karren@epa.gov

110. A Purchaser seeking to provide financial assurance by means of a demonstration or guarantee under Paragraph 108.e or 108.f must, within twenty (20) days of the Effective Date:

a. Demonstrate that:

(1) the Purchaser or guarantor has:

i. Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and

ii. Net working capital and tangible net worth each at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. Tangible net worth of at least $10 million; and

iv. Assets located in the United States amounting to at least ninety (90) percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; or

(2) The Purchaser or guarantor has:

i. A current rating for its senior unsecured debt of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's; and

ii. Tangible net worth at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. Tangible net worth of at least $10 million; and

iv. Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

b. Submit to EPA for the affected Purchaser or guarantor: (1) a copy of an independent certified public accountant's report of the entity's financial statements for the latest completed fiscal year, which must not express an adverse opinion or disclaimer of opinion; and (2) a letter from its chief financial officer and a report from an independent certified public accountant substantially identical to the sample letter and reports available from EPA or under the "Financial Assurance - Settlements" subject list category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/.

111. A Purchaser providing financial assurance by means of a demonstration or guarantee under Paragraph 108.e or 108.f must also:

a. Annually resubmit the documents described in Paragraph 110 within ninety (90) days after the close of the Purchaser's or guarantor's fiscal year;

b. Notify EPA within thirty (30) days after the Purchaser or guarantor determines that it no longer satisfies the relevant financial test criteria and requirements set forth in this Section; and

c. Provide to EPA, within thirty (30) days of EPA's request, reports of the financial condition of the Purchaser or guarantor in addition to those specified in Paragraph 110; EPA may make such a request at any time based on a belief that the Purchaser or guarantor may no longer meet the financial test requirements of this Section.

112. Purchaser shall diligently monitor the adequacy of the financial assurance. If Purchaser becomes aware of any information indicating that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section,

Purchaser shall notify EPA of such information within thirty (30) days. If EPA determines that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, EPA will notify Purchaser of such determination. Purchaser shall, within thirty (30) days after notifying EPA or receiving notice from EPA under this Paragraph, secure and submit to EPA for approval a proposal for a revised or alternative financial assurance mechanism that satisfies the requirements of this Section. EPA may extend this deadline for such time as is reasonably necessary for Purchaser, in the exercise of due diligence, to secure and submit to EPA a proposal for a revised or alternative financial assurance mechanism, not to exceed forty-five (45) days. Purchaser shall follow the procedures of Paragraph 114 (Modification of Amount, Form, or Terms of Financial Assurance) in seeking approval of, and submitting documentation for, the revised or alternative financial assurance mechanism. Purchaser's inability to secure financial assurance in accordance with this Section does not excuse performance of any other obligation under this Settlement.

113. **Access to Financial Assurance**

a. If EPA issues a notice of implementation of a Work Takeover under Paragraph 92, then, in accordance with any applicable financial assurance mechanism, EPA is entitled to: (1) the performance of the Work; and/or (2) require that any funds guaranteed be paid in accordance with Paragraph 113.d.

b. If EPA is notified by the issuer of a financial assurance mechanism that it intends to cancel the mechanism, and Purchaser fails to provide an alternative financial assurance mechanism in accordance with this Section at least thirty (30) days prior to the cancellation date, the funds guaranteed under such mechanism must be paid prior to cancellation in accordance with Paragraph 113.

c. If, upon issuance of a notice of implementation of a Work Takeover under Paragraph 92, either: (1) EPA is unable for any reason to promptly secure the resources guaranteed under any applicable financial assurance mechanism, whether in cash or in kind, to continue and complete the Work; or (2) the financial assurance is a demonstration or guarantee under Paragraph 108.e or 108.f then EPA is entitled to demand an amount, as determined by EPA, sufficient to cover the cost of the remaining Work to be performed. Purchaser shall, within fifteen (15) days of such demand, pay the amount demanded as directed by EPA.

d. Any amounts required to be paid under this Paragraph 113 must be, as directed by EPA: (i) paid to EPA in order to facilitate the completion of the Work by EPA or by another person; or (ii) deposited into an interest-bearing account, established at a duly chartered bank or trust company that is insured by the FDIC, in order to facilitate the completion of the Work by another person. If payment is made to EPA, EPA may deposit the payment into the EPA Hazardous Substance Superfund or into the Sand Creek Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

e. All EPA Work Takeover costs not paid under this Paragraph 113 must be reimbursed as Response Costs under Section XIII (Payment of Response Costs).

114. **Modification of Amount, Form, or Terms of Financial Assurance.** Purchaser may submit, on any anniversary of the Effective Date or at any other time agreed to by the EPA and Purchaser, a request to reduce the amount, or change the form or terms, of the financial assurance mechanism. Any such request must be submitted to EPA in accordance with Paragraph 123, and must include an estimate of the cost of the remaining Work, an explanation of the bases for the cost calculation, and a description of the proposed changes, if any, to the form or terms of the financial assurance. EPA will notify Purchaser of its decision to approve or disapprove a requested reduction or change pursuant to this Paragraph. Purchaser may reduce the amount of the financial assurance mechanism only in accordance with: (a) EPA's approval; or (b) if there is a dispute, the agreement or written decision resolving such dispute under Section XIV (Dispute Resolution). Purchaser may change the form or terms of the financial assurance mechanism only in accordance with EPA's approval. Any decision made by EPA on a request submitted under this Paragraph to change the form or terms of a financial assurance mechanism is not subject to challenge by Purchaser pursuant to the dispute resolution provisions of this Settlement or in any other forum. Within thirty (30) days after receipt of EPA's approval of, or the agreement or decision resolving a dispute relating to, the requested modifications pursuant to this Paragraph, Purchaser shall submit to EPA documentation of the reduced, revised, or alternative financial assurance mechanism in accordance with Paragraph 109.

115. **Release, Cancellation, or Discontinuation of Financial Assurance.** Purchaser may release, cancel, or discontinue any financial assurance provided under this Section only: (a) in accordance with EPA's approval of such release, cancellation, or discontinuation or (b) if there is a dispute regarding the release, cancellation, or discontinuance of any financial assurance, in accordance with the agreement or final decision resolving such dispute under Section XIV (Dispute Resolution).

XXVI. MODIFICATION

116. EPA's RPM may make non-material modifications to any plan or schedule or the Work Plan in writing or by oral direction. EPA's RPM shall make a reasonable attempt to confer with the State Project Manager before making any such modification. Any oral modification will be memorialized in writing by EPA promptly and sent to the Purchaser and State Project Manager, but has as its effective date the date of the RPM's oral direction, unless otherwise indicated. Any other requirements of this Settlement may be modified in writing by mutual agreement of the Parties, unless otherwise specified in this Settlement.

117. If Purchaser seeks permission to deviate from any approved work plan or schedule or the Work Plan, Purchaser's Project Coordinator shall submit a written request to EPA and the State for approval outlining the proposed modification and its basis. Purchaser may not proceed with a requested deviation under this Paragraph until receiving oral or written approval from the RPM pursuant to Paragraph 116.

118. No informal advice, guidance, suggestion, or comment by the RPM or other EPA representatives or the State's Project Manager regarding any deliverable submitted by Purchaser shall relieve Purchaser of its obligation to obtain any formal approval required by this Settlement, or to comply with all requirements of this Settlement, unless it is formally modified.

XXVII. INTEGRATION/APPENDICES

119. This Settlement constitutes the entire agreement among the Parties regarding the subject matter of the Settlement and supersedes all prior representations, agreements and understandings, whether oral or written, regarding the subject matter of the Settlement embodied herein. The following appendices are attached to and incorporated into this Settlement.

a. Appendix 1 is the Work Plan.

b. Appendix 2 is a map of the Site.

c. Appendix 3 is a map depicting the Property.

d. Appendix 4 provides the surveys and legal descriptions of the Property.

e. Appendix 5 is a compilation of Institutional Controls for the Property.

f. Appendix 6 is the HSP for the Property

g. Appendix 7 is the approved MMP for the Property

h. Appendix 8 is substantially the form for modification, pursuant to Paragraph 8 (Transfer)

XXVIII. ENFORCEMENT

120. The Parties agree that the United States District Court for the District of Colorado ("Court") will have jurisdiction pursuant to Section 113(b) of CERCLA, 42 U.S.C. § 9613(b), for any judicial enforcement action brought with respect to this Settlement. Solely for the purposes of Section 113(j) of CERCLA, 42 U.S.C. Section 9613(j), the remedy set forth in the ROD or Section VII (Response Actions To Be Performed) to be performed by Purchaser shall constitute a response action taken or ordered by the President for which judicial review shall be limited to the administrative record.

121. Notwithstanding Paragraph 86 of this Settlement, if Purchaser fails to comply with the terms of this Settlement, the United States or the State may file a lawsuit for breach of this Settlement, or any provision thereof, in the Court. In any such action, Purchaser consents to and agrees not to contest the exercise of personal jurisdiction over it by the Court. Purchaser further acknowledges that venue in the Court is appropriate and agrees not to raise any challenge on this basis.

122. If the United States or the State file a civil action as contemplated by Paragraph 121, above, to remedy breach of this Settlement, the United States may seek, and the Court may grant as relief, the following: a) an order mandating specific performance of any term or provision in this Settlement, without regard to whether monetary relief would be adequate; and b) any additional relief that may be authorized by law or equity.

XXIX. NOTICES AND SUBMISSIONS

123. Any notices, documents, information, reports, plans, approvals, disapprovals, or other correspondence required to be submitted from one party to another under this Settlement, are deemed submitted either when an email is transmitted and received, it is hand-delivered, or as of the date of receipt by certified mail/return receipt requested, express mail, or facsimile.

Address submissions to Purchaser to:

Triangle Logistics Center, LLC
130 East Randolph Street, Suite 2100
Chicago, IL 60601
Attention: Legal Department, Michael Podboy & Joe Trinkle
Email: legalnotices@ca-ventures.com, mpodboy@ca-ventures.com; and jtrinkle@ca-ventures.com

With copies to:

Polsinelli PC
150 N. Riverside, Suite 3000
Chicago, IL 60606
Attention: Eric G. Greenfield & Keith H. Londo
Email: egreenfield@polsinelli.com and klondo@polsinelli.com

Kaplan Kirsch & Rockwell LLP
1675 Broadway, Suite 2300
Denver, Colorado 80202
(303) 825-7000
Attention: Polly B. Jessen
Email: pjessen@kaplankirsch.com

Address submissions to EPA to:

Sai Appaji
Remedial Project Manager – Sand Creek Site
Superfund and Emergency Management Division
U.S. EPA Region 8
1595 Wynkoop Street
Denver, Colorado 80202
(303) 312-6313
Appaji.Sairam@epa.gov

Max Greenblum
Senior Assistant Regional Counsel
Office of Regional Counsel
U.S. EPA Region 8
1595 Wynkoop Street
Denver, Colorado 80202
(303) 312-6108
Greenblum.Max@epa.gov

Address submissions to DOJ to:

eescdcopy.enrd@usdoj.gov
DJ Number: 90-11-3-167/2 (Attn.: Stacy Coleman)

Address submissions to the State to

Kyle Sandor
Hazardous Materials and Waste Management Division Project Manager
Environmental Protection Specialist II
4300 Cherry Creek Drive South
Denver, CO 80246
Kyle.Sandor@state.co.us

With copies to:

Emily Splitek
Assistant Attorney General
Colorado Attorney General's Office
1300 Broadway, 7th Floor
Denver, CO 80203

XXX. PUBLIC COMMENT

124. This Settlement is subject to a thirty (30)-day public comment period, after which the United States and the State may withhold its consent or seek to modify this Settlement if comments received disclose facts or considerations that indicate that this Settlement is inappropriate, improper or inadequate.

XXXI. EFFECTIVE DATE

125. The Effective Date of this Settlement is the date upon which both of the following have occurred: (1) EPA issues written notice to Purchaser that the United States and the State have fully executed the Settlement after review of and response to any public comments received; and (2) Purchaser acquires the Property. Purchaser shall notify EPA and the State in writing within three (3) days of acquiring the Property.

Signature Page for Administrative Settlement Agreement regarding the Sand Creek Superfund Site (CERCLA Docket No. CERCLA-08-2022-0005)

IT IS SO AGREED:

BY:

Triangle Logistics Center, LLC, Date
a Delaware limited liability company
Michael Podboy, its authorized signatory

Signature Page for Administrative Settlement Agreement regarding the Sand Creek Superfund Site (CERCLA Docket No. CERCLA-08-2022-0005)

IT IS SO AGREED:

THE STATE OF COLORADO

BY:

Tracie White Digitally signed by Tracie White
Date: 2022.04.28 15:41:08 -06'00'

Tracie White Date
Division Director
Hazardous Materials and Waste Management Division
Colorado Department of Public Health and Environment

Approved as to form:

Emily Splitek Digitally signed by Emily Splitek
Date: 2022.04.28 11:33:17 -06'00'

Emily Splitek (Attorney Reg. #46619) Date
Assistant Attorney General
Colorado Attorney General's Office

Signature Page for Administrative Settlement Agreement regarding the Sand Creek Superfund Site (CERCLA Docket No. CERCLA-08-2022-0005)

IT IS SO AGREED:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

BY:

Bielenberg, Ben Digitally signed by Bielenberg, Ben
Date: 2022.04.27 17:29:50 -06'00'

Betsy Smidinger Date
Division Director
Superfund and Emergency Management Division
U.S. Environmental Protection Agency, Region 8

AMY SWANSON Digitally signed by AMY SWANSON
Date: 2022.04.28 14:24:42 -06'00'

Christopher Thompson Date
Associate Regional Counsel for Enforcement
Office of Regional Counsel
U.S. Environmental Protection Agency, Region 8

Signature Page for Administrative Settlement Agreement regarding the Sand Creek Superfund Site (CERCLA Docket No. CERCLA-08-2022-0005)

IT IS SO AGREED:

UNITED STATES DEPARTMENT OF JUSTICE

BY:
NATHANIEL DOUGLAS

Digitally signed by NATHANIEL DOUGLAS
Date: 2022.04.27 12:45:48 -04'00'

_____

Nathaniel Douglass, Deputy Section Chief Date
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
Washington, D.C. 20530

Appendix 1 – Work Plan

Work Plan

Proposed Triangle Logistics Center Redevelopment
48TH and Holly Landfill - Sand Creek Industrial Superfund Site
48th Avenue and Ivy Street
City and County of Denver and
Commerce City, Adams County, Colorado
April 19, 2022
Terracon Project No. 25207313

Prepared for:
CA Industrial Holdings, LLC
Chicago, Illinois

Prepared by:
Terracon Consultants, Inc.
Wheat Ridge, Colorado

April 19, 2022

CA Industrial Holdings, LLC
130 East Randolph Street, Suite 2100
Chicago, Illinois 60601

Attn: Mr. Joe Trinkle
P: (281) 779-6645
E: jtrinkle@ca-centures.com

Re: **Work Plan**
Proposed Triangle Logistics Center Redevelopment
48th and Holly Landfill
Sand Creek Industrial Superfund Site
City of Denver and Commerce City, Colorado
Terracon Project No. 25207313

Dear Mr. Trinkle:

Terracon Consultants, Inc. (Terracon) is pleased to submit the enclosed Work Plan pursuant to Terracon Proposal No. 25207313. We appreciate the opportunity to be of service to you on this project. If there are any questions regarding this Work Plan or if you need additional information, please do not hesitate to contact us.

Sincerely,
Terracon Consultants, Inc.

Brian M. Williams
Senior Staff Geologist

Mark E. White, P.G.
Environmental Department Manager

Attachments

TABLE OF CONTENTS

Figures

APPENDICES

ACCRONYMS

1,1-DCE	1,1-Dichloroethene
1,2-DCE	1,2-Dichloroethene
1,1,1-TCA	1,1,1-Trichloroethane
ACM	Asbestos Containing Materials
AOC	Administrative Order of Consent
AASHTO	American Association of State Highway and Transportation Officials
bgs	below ground surface
BNR	Burlington Northern Railroad (now Burlington Northern Santa Fe)
BNSF	Burlington Northern Santa Fe Railroad
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
EDD	Electronic data deliverable
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
DD	Development Design Drawings
FFS	Focused Feasibility Study
FSP	Field Sampling Plan
GMP	Gas Monitoring Point
GPS	Global Positioning System
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
HIS	Hydro-Search, Inc.
HLA	Harding Lawson and Associates
LABC	Los Angeles Building Code
LEL	Lower Explosive Limit
LFG	Land Fill Gas
LFGES	Land Fill Gas Extraction System
LFGEW	Landfill Gas Extraction Well
LI	Landfill, Inc. (now Republic Services)
MMG	Medium Mobility Grout
MMP	Materials Management Plan
MMS	Methane Mitigation System
Mn	Manganese
NELAP	National Environmental Laboratory Accreditation Program
NFPA	National Fire Protection Association
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethene
PID	Photoionization detector
PLC	Programmable Logic Controller
PM	Project Manager

PPA	Prospective Purchaser Agreement
PPE	Personal protective equipment
PVC	Polyvinyl chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD/RI	Remedial Design/Remedy Implementation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
ROW	Right-of-way
SACFPB	South Adams County Fire Prevention Bureau
SARA	Superfund Amendments and Reauthorization Act
SCH	Schedule
SGC	Soil Gas Collectors
SGCS	Soil Gas Collection System
SOPs	Standard Operating Procedures
SOW	Statement of Work
SSD	Sub-Slab Depressurization
TBD	To Be Determined
TCE	Trichloroethene
TCHD	Tri-County Health Department
UST	Underground Storage Tank
VC	Vinyl chloride
VI	Vapor Intrusion
VOC	Volatile organic compound
wc	Water Column

Work Plan
Proposed Triangle Logistics Center Development
48th and Holly Landfill
Sand Creek Industrial Superfund Site
City of Denver and Commerce City, Colorado
Terracon Project No. 25207313

1.0 INTRODUCTION

This Work Plan for redevelopment of the 48th and Holly Landfill (the Landfill), a portion of the Sand Creek Industrial Superfund Site (Sand Creek Site), was prepared on behalf of CA Industrial Holdings, LLC and Triangle Logistics Center, LLC, and is an exhibit to the Administrative Settlement Agreement for Response Actions and Payment of Response Costs by Prospective Purchaser (PPA) entered into between Triangle Logistics Center, LLC, and United States Environmental Protection Agency (EPA).

1.1 Site Background

The site consists of approximately 93.75 acres corresponding to Adams County Assessor parcels 0182317300008 and 0182317300029,and City and County of Denver Assessor schedule number 01184-00-014-000. The portion of the site residing within Commerce City in Adams County is approximately 64.20 acres. This approximately triangular shaped area is bounded by 48th Avenue to the south and a Union Pacific railroad right-of-way (ROW) to the north. The western edge of this area is defined by a line extending north along Forest street from the southwest corner of the site to the intersection with the railroad ROW. Ivy Street separates the two Commerce City parcels and transects the site south to north. The approximately 29.55 acres of the site residing within City and County of Denver represents an irregularly shaped area bounded by Dahlia street to the west, the railroad ROW to the north, Forest street to the south and the Commerce City portion of the site to the east **(Figure 1**). The site encompasses the bulk of the 48th and Holly Landfill (Landfill) which has been designated by EPA as a portion of the Former Sand Creek Industrial Superfund Site. The site is further adjoined to the southeast by the Chemical Sales Superfund Site (**Figure 2**).

The Sand Creek Industrial Superfund Site occupies approximately 300 acres within portions of both Commerce City in Adams County, Colorado, and the City and County of Denver. The Sand Creek Industrial Superfund Site encompasses four known sources of contamination, the Colorado Organic Chemical Company property, the 48th and Holly Landfill (the site), the L.C. Corporation property, and the Oriental Refinery property, and was established by EPA in December 1982.

EPA defined six Operable Units (OU)s within the Sand Creek Industrial Superfund Site, two of which were specifically associated with the Landfill:

- OU 3: Contaminated groundwater, surface water, sediment, soil and air in the vicinity of the Landfill; and
- OU 6: Gaseous emissions from the Landfill.

The Landfill was operated as a municipal waste landfill from approximately 1967 through 1975. In 1977, prior to assessment activities associated with the Sand Creek Industrial Superfund Site, Colorado Department of Public Health and Environment (CDPHE), Tri-County Health Department (TCHD), and the South Adams County Fire Prevention Bureau (SACFPB) conducted investigations into two explosions that occurred during utility infrastructure construction activities in the vicinity of the Landfill. At that time, the investigation concluded that methane gas was migrating from the landfill. Landfill ownership installed an experimental extraction system in the 1980s in response.

The Landfill was initially included as a part of the Sand Creek Industrial Superfund Site due to the presence of volatile organic compounds (VOCs) in groundwater downgradient from portions of the Landfill (Hydro-Search, Inc. [HSI], 1986). On February 8, 1990, EPA issued an Administrative Order of Consent (AOC; Docket No. CERCLA VIII-90-08) to Landfill, Inc. (LI, now BFI) and Burlington Northern Railroad BNR, (now BNSF) to perform a Remedial Investigation/Feasibility Study (RI/FS) for the 48th and Holly Landfill. EPA's Statement of Work (SOW) in the OU3 AOC included the existing landfill, the spring emerging from the toe of the landfill, and the associated surface-water drainage to the point where the drainage enters a concrete-lined ditch. Harding Lawson Associates, Inc. (HLA) completed the draft revised Risk Assessment in April 1992 and the final Risk Assessment was issued for OU3 in June 1992. The Risk Assessment was revised in response to EPA comments in 1993.

On August 15, 1990, concurrent with the EPA issuance of the AOC for OU3, EPA issued a Unilateral Order (Docket No. CERCLA-VIII-90-20) identifying landfill gas and landfill gas migration as OU6 and requiring LI and BNR through the OU6 Removal Action to address explosive and health risks associated with landfill gas emissions migrating offsite from the Landfill. In November 1990, an Engineering Evaluation/Cost Analysis (EE/CA) was prepared for OU6. The EPA prepared an Action Memorandum in December 1990, and the existing active landfill gas-extraction system (LFGES) was installed by LI and BNR in June 1991 as part of the OU6 Removal Action. An amendment issued in September 1990 to the OU3 AOC provided for the inclusion of gaseous emissions from the Landfill (i.e., OU6) under OU3 following the full implementation of the OU6 Removal Action.

The Focused Feasibility Study (FFS) for OU3 and OU6 was completed and submitted to EPA in March 1993, and the Final Work Plan/Remedial Design Report for the Remedial Design/Remedial Action (RD/RA) was prepared by HLA and submitted in July 1994.

The Record of Decision (ROD) for OU3 and OU6 (June 30, 1993) **(Appendix A)** referenced in the PPA formally defines the selected remedy for the site developed in accordance with the Comprehensive Environmental Response Compensation and liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), applicable state laws. Following completion of OU3 and OU6 response actions, the site was removed from the National Priorities List (NPL) in 1996.

1.2 Purpose and Scope

This Work Plan was prepared for Triangle Logistics Center, LLC and approved by the United Stated Environmental Protection Agency Region 8 and CDPHE and presents the anticipated actions necessary to redevelop the 48th and Holly landfill while continuing to implement the EPA approved remedy for OU3 and OU6 of the Sand Creek Industrial Superfund Site. This document presents the conceptual modifications to the existing Landfill Gas Extraction System (LFGES) that will be implemented in order to develop the site, a description of the conceptual Methane Intrusion Mitigation System (MMS) designs to be incorporated into the proposed building designs, and the continued implementation of the EPA approved remedy for OU3 and OU6.

In preparing this work plan the following documents were reviewed:

- ROD for OU 3 and OU 6 (EPA, 1993) **(Appendix A)**
- EPA Statement of Work RD/RA Sand Creek Superfund Site Operable Units 3/6 (EPA SOW, 1993) **(Appendix B)**
- Final RD/RA Workplan Prepared by HLA (HLA, 1994) **(Appendix C)**
- Operation and Maintenance Manual – Landfill Gas Extraction System, 48th and Holly Landfill, Operable Unit 6, Sand Creek Industrial Site (RPs, 1992).

The ROD (EPA, 1993) and EPA Statement of Work (EPA SOW, 1993), and Final RD/RA Workplan (HLA, 1994) identified the following six ongoing tasks associated with the approved site remedy:

- Task 1: Continued Operation and Maintenance (O&M) of the LFGES with improvements, as required, during the normal course of O&M.
- Task 2: Continued maintenance of the soil cover system with improvements, as required, during the normal course of O&M.
- Task 3: Continued maintenance of the perimeter fence and warning signs.
- Task4: Implementation of an environmental monitoring program.
- Task 5: Continue existing institutional controls and implement additional institutional controls as necessary.
- Task 6: Conduct periodic reviews every 5-years of the remedy effectiveness at the 48th and Holly Landfill.

It is the design intent of this workplan to minimize changes with regards to the previously approved activities to the extent necessary to facilitate redevelopment of the Landfill. The following summarizes proposed site redevelopment and effects to the ongoing tasks identified as part of the approved remedy:

TASK	ANTICIPATED EFFECTS OF SITE REDEVELOPMENT
Task 1- Continued O&M of the LFGES	The existing LFGES will need to be modified to accommodate construction of nine site buildings and associated infrastructure. Site grade changes will require modification to the main headers and a number of the laterals and extraction wells. Proposed ground improvement and building pad locations will require abandoning and relocating some of the existing extraction wells. The proposed changes envision a slight reduction in the number of extraction wells, however, perimeter control will be maintained. Site redevelopment activities are anticipated to reduce the amount of LFG produced at the site. A medium mobility grout used to support the building foundation will encapsulate waste below each of the building pads from existing land surface to the base of the landfill. Stormwater infiltration into landfill waste will be greatly reduced by the placement of between 8 to 15 feet of clean backfill in the northern half of the site, construction of impervious surfaces, (paved parking, roadways, hardscapes, and buildings), and engineered stormwater conveyance and detention facilities.
Task 2 - Continued maintenance of the soil cover system	To level the site for the proposed site redevelopment, construction activities will reduce current site grades and raise site elevations by up to 20 feet through the import of approximately 462,000-cubic-yards of clean backfill material. Proposed site buildings are currently anticipated to occupy a footprint of approximately 1.3 million square-feet (28.2 acres) and coupled with associated parking and driveway hardscapes, it is anticipated that more than 73% of the site will be converted from a pervious to an impervious surface. The site buildings, pavement, and increased thickness of the clean backfill cover is expected to improve the effectiveness of the soil cover system component of the remedy designed to prevent dermal contact with site waste.
Task 3 - Continued maintenance of the perimeter fence and warning signs.	Site security will be considered as part of the final site plan and individual tenant requirements. It is expected that portions of the perimeter fence will be replaced, though tenant access considerations will drive the final layout. Equipment associated with the LFGES will be secured behind fencing and/or subsurface vault structures and warning signs will be posted as appropriate. The proposed site buildings will be designed with individual Methane Mitigation Systems (MMS) to protect the occupants and structures from landfill gas migration. These MMS systems will include continuous landfill gas monitoring and alarm systems and warning signs will also be associated with these systems.

	Within the redeveloped portions of the site, landfill gas warning signs will be posted as appropriate on the accesses to subgrade structures and utility lines where landfill gas accumulation is possible as well as on the site buildings adjacent to the alarm horns and strobes.
Task 4 - Implement an environmental monitoring program.	The environmental monitoring program established under the ROD, EPA SOW, Final RD/RA Workplan, and EPA approved modifications[1] includes an annual groundwater sampling event, monthly LFGES monitoring events, and bi-weekly monitoring of the perimeter Gas Monitoring Points (GMP). Discussed in greater detail in Sections 7.0, 8.0, 9.0, and 10.0, this program will be maintained, with slight modification to the number of extraction wells sampled. Otherwise, the extraction wells, perimeter GMP's, and the flare station will be monitored per existing SOPs. The groundwater monitoring established in the HLA workplan will continue in its current form. Quarterly monitoring of the building MMS's will be added to the environmental monitoring program.
Task 5 – Institutional controls	Modification of the existing institutional controls will be required to allow for redevelopment of the site. However, the modified controls will continue to: ■ Prohibit use of onsite groundwater; ■ Require for continued maintenance of the soil cap remedy to prevent dermal contact with landfill waste; and ■ Require continued operation and maintenance of the LFGES at the site. Modifications will be implemented through new and amended notices of environmental use restrictions pursuant to CRS 25-15-321.5 and will include new requirements to implement vapor mitigation systems in new buildings on the Property and conduct site redevelopment activities pursuant to plans approved by CDPHE and EPA.
Task 6 – Periodic Reviews	Consistent with the ROD and current practices, periodic reviews of the 48th and Holly Landfill remedy will be conducted every 5-years. A report detailing the evaluation of the 48th and Holly Landfill remedy will be submitted to EPA in support of the EPA/CDPHE led 5-year reviews of the greater Sand Creek Industrial Superfund site.

[1] *Response to Request to Modify Constituent List and Discontinue the Groundwater Sampling Program for the 48th and Holly Landfill of the Sand Creek Superfund Site*, USEPA, February 11, 2002.

2.0 PROPOSED REDEVELOPMENT

2.1 Project Description

Proposed redevelopment plans for the site include the construction of commercial/industrial warehouse buildings, hardscapes, truck loading docks, car and trailer parking, stormwater conveyance and detention structures, modifications to the existing LFGES, and associated utility improvements. The conceptual redevelopment plan, pending state and local agency approvals, is included as **Figure 3** of this workplan.

The Landfill has been subdivided into three sections corresponding to three phases of construction for planning purposes. The Phase I area includes the building pads and site grounds around buildings 1, 2N, and 2S. The Phase II area includes the construction of building pads and site areas around buildings 3, 4, and 5. The Phase I and Phase II areas are located within City of Commerce City in Adams County. Phase III will include the redevelopment of the BNSF parcel located within City and County of Denver (Buildings 6, 7, and 8).

The conceptual redevelopment plans depicted in **Figures 4, 5, and 6,** represent the initial Phase I and Phase II construction areas for the site. This document is generally developed to give a broader outline of proposed redevelopment activities across all three construction phase areas, though certain sections, notably Section 4.0, 5.0, and Section 6.0, will note where additional details will be provided to EPA and CPHE in subsequent submittals as redevelopment plans solidify.

2.2 Proposed Construction Activities Expected to Impact the Existing Remedy

The site redevelopment plan includes the proposed construction of nine commercial warehouse buildings, several stormwater detention/retention ponds, parking lots, driveways, retention walls, and associated building utility infrastructure. In order to facilitate site redevelopment, the following activities are anticipated to impact the existing remedy.

- Ground improvement
- Site grading and utility installation, including:
  - landfill material excavation and relocation or removal;
  - backfill import; and,
  - final grading
- Existing LFGES modification

Additional discussion of each of these activities are included Sections 3.0, 4.0, and 5.0.

Stormwater drainage at the site is anticipated to be routed via a combination of curb and gutter and subsurface stormwater drainage structures and piping to stormwater detention ponds located along the northern edge of the site. The stormwater detention pond designs will be detailed in the final design package for the LFGES modifications outlined in Section 5.0. The detention ponds will be lined to prevent stormwater infiltration. The detention pond liner designs will be consistent with 6 CCR 1007-2, Part 1, CDPHE Hazardous Materials and Waste Management Division Regulations Pertaining to Solid Waste Sites and Facilities, Section 9.3.1, subsections (A) and (B), excluding the subsequent requirements for leak detection, fluid level measurement, access control, stormwater control, and groundwater monitoring. The choice to construct a liner beneath the stormwater detention pond meeting the design requirements for Type B Waste Impoundments, in no way classifies the detained stormwater as a “solid waste” as defined in the above regulations. The prescriptive liner designs provided within 6 CCR 1007-2, Part 1 are considered protective of groundwater quality and are therefore a benefit to this project and

environmental conditions at the site by reducing the occurrence of contaminant migration from the landfill waste to the water table through stormwater leaching.

During building construction, methane mitigation systems (MMS) will be installed in each of the planned site buildings. These systems are discussed in more detail in Section 6.0.

3.0 GROUND IMPROVEMENT

Differential settlement is a common concern with regards to landfill redevelopment. The uneven decomposition of organic matter in the subsurface and the consolidation of loose placed waste material and the associated differential settlement represent a threat to the structural integrity of constructed surface features (i.e., buildings, parking lots, hardscapes, and utilities). As such, sub-surface ground improvement will be required for portions of the site beneath building pads and in designated utility corridors in order to mitigate differential settlement.

3.1 Proposed Ground Improvement Technology

There are currently multiple technologies and engineering solutions available to accommodate commercial building construction on landfill sites. For this site, compaction grouting, through the use of injected medium mobility grout (MMG) has been selected as the most advantageous ground improvement technology. This soil improvement technology drills a small diameter (4-inch) injection pipe into the ground, typically to the maximum treatment depth. An MMG is then injected into the waste material as the drill pipe is withdrawn upwards, creating columns of overlapping grout bulbs. The grout is injected under pressure, and the expansion of the grout in the subsurface displaces and compacts the surrounding soils. The cement grout will also flow outward from the injection point to fill, connected pore and void spaces with flowable cement. The grout columns will be injected in gridded areas beneath the building footprints. The estimated design grid spacing for the columns is 10 to 15 feet on center. The final design grid spacing will be determined based on the results of the design level geotechnical investigation and the planned MMG injection pilot test. The injection of this low to medium mobility grout will begin in the native soils just above the groundwater interface and will continue up through the landfill waste to the current ground surface. During placement, grout pressures and flow rates will be monitored to evaluate lateral grout migration and to prevent daylighting and waste blowback. This injection drilling technology does not usually produce soil cuttings, and the contractor should not to need to manage landfill waste during the injection process. In the unlikely event that waste material needs to be managed during injection drilling activities, it will be handled in accordance with the EPA approved Materials Management Plan (MMP) included as **Appendix 7** of the PPA.

This technology was selected primarily based on its cost-effectiveness given the large site area requiring improvement. The grout columns will both compact and entrap landfill waste material as well as fill higher porosity areas and void spaces. This technology has been used extensively in landfill redevelopment sites across the country and is a cost effective method for establishing secure constructible foundations.

Secondary benefits of this technology include a reduction in the volume of waste material disturbed as part of foundation construction activities, as well as an overall reduction in the methane generation capacity of the landfill over time due to (1) the encapsulation of landfill waste in grout and (2) lowering of moisture transport into the waste material as the result of the pore space cementation.

3.2 Ground Improvement Injection and Monitoring Activities

During injection activities, the existing LFGES will be monitored to evaluate the impact the grout injection has on LFG production at the site. The exact sequencing, injection locations, and/or construction schedule have not yet been determined, however, bi-weekly monitoring of the extraction wells and gas monitoring points will occur throughout the injection program. The initial bi-weekly monitoring period may be adjusted with agency notification based on observed site conditions. The monitoring program will include the following parameters:

- Land Fill Gas Extraction Wells (LFGEWs) - date, time, vacuum, vapor velocity/flow, vapor temperature, % methane, % oxygen;
- GMPs - date, time, vacuum, % methane, % oxygen;
- LFGES main header at blower building - date, time, blower inlet gas temperature, blower inlet vacuum, gas flow rate, blower discharge methane concentration, blower discharge oxygen concentration, and flare temperature.

Injection activities are expected to comply with the MMP as well as the site Health and Safety Plan (HASP) included as **Appendix 6** of the PPA. Both the HASP, as well as the injection contractor's HASP will describe specific practices and actions that will be taken on a continuous basis to mitigate potential worker safety issues associated with the LFG.

4.0 SITE GRADING, UTILITY INFRASTRUCTURE INSTALLATION, AND BACKFILL IMPORT

Currently, the site topography slopes down approximately 10% from the southern landfill boundary to the north. In order to facilitate building construction, current site grades will need to be leveled, and site elevations raised by more than 20 feet in some places through the import of upwards of 462,000 cubic yards of clean backfill material. These grading activities along with the stormwater detention structure construction and utility infrastructure installation are also expected to require excavation and relocation of approximately 132,000 cubic yards of the existing soil cover and underlying waste material. A cut/fill diagram depicting the proposed extents and depths of cut and fill for the Phase I and Phase II construction areas is attached as **Figure 4**. Cut/fill analysis for all three construction phases will be submitted to EPA and CDPHE with the Draft 95% LFGES Modification Design Drawings (DD's) discussed in Section 5.6 below.

4.1 Excavated Waste Handling

Excavated waste material will be managed either through off-site disposal at a registered Resource Conservation and Recovery Act (RCRA) Subtitle D (or Subtitle C if the waste is determined to be hazardous) disposal facility and/or will be relocated to portions of the site receiving more than 5 feet of imported soil cover based on final construction plans, construction sequencing, and/or engineering recommendations.

Prior to being relocated onsite, the excavated waste will be evaluated for the presence of asbestos containing materials (ACM) debris and other items or materials deleterious to construction (e.g. drums, tanks, and/or visual or olfactory evidence of petroleum or other hazardous materials releases). Excavated waste containing ACM debris or obviously contaminated soils and or other deleterious items will be managed per the approved MMP for the site. Waste judged to be free of ACM debris and suitable for reuse at the site will be placed in compacted lifts prior to being covered with clean fill material to final grade. Specific compaction requirements and lift thicknesses for the relocated waste will be established by the civil, geotechnical, ground improvement, and structural engineers for the project.

No more than 25% of the landfill material anticipated to be disturbed during construction will be exposed at any one-time during site grading activities. Additional details regarding site grading activities, as they relate to exposed landfill material, will be included in the Construction Phasing and LFGES Shutdown Sequencing Plan.

Site grading plans will be submitted to relevant state and local agencies as part of the construction permitting process.

4.2 Fill Material Characterization

CDPHE Soil Reuse and Clean Fill Guidance (June 2020) (**Appendix D)** will be referenced for evaluating and characterizing the borrow site and fill material used at the site. A discussion of the borrow source environmental evaluation will be included in the draft LFGES Modification Construction Completion Report.

5.0 LANDFILL GAS EXTRACTION SYSTEM MODIFICATIONS

Due to the volume of clean backfill material being imported to the site and the magnitude of the anticipated grade changes, modification of the existing LFGES is expected to occur in conjunction with site grading activities. The exact phasing of the modification activities has yet to be determined but is discussed conceptually in Section 5.3.

5.1 Site Description

A site plan of the existing landfill gas extraction system is shown in **Figure 5** and includes the following:

- 75 landfill gas extraction wells and associated well vaults;
- Manifolds which convey landfill gas from the wells to the LFGES main header;
- 28 off-site LFG monitoring points (GMP);
- Four (4) condensate sumps along the main header of the LFGES with associated sump pumps / motors, electric conduit / wire, control panels;
- One 10,000-gallon underground storage tank (UST) for condensate;
- Vacuum blower building;
- Water vapor knock-out tank;
- LFG flare;
- Associated instrumentation and controls; and,
- Above ground propane tank.

5.2 LFGES modification

The existing LFGES will be modified for the proposed redevelopment. The modifications to the LFGES will include the following:

- Abandonment of LFGEWs within the footprints of the proposed buildings.
- Relocation and replacement of some of the abandoned LFGEWs.
- Abandonment of LFGES manifold piping from LFGEWs to LFGES main header.
- Replacement of LFGES manifold piping from LFGEWs to LFGES main header.
- Abandonment of portions of the LFGES main header.
- Replacement of portions of the LFGES main header.
- Abandonment of onsite condensate sumps.
- Installation of new condensate sump system.
- Installation of a new condensate holding tank and discharge line.
- Relocation or replacement of the flare system.

A plan that shows the proposed redevelopment and the conceptualized modified LFGES for the approximately 64.20 acres of the landfill located to the east of Forest Street (referred to in this document as the Phase I and Phase II redevelopment areas) is shown in **Figure 6**. The redevelopment team is in the process of conceptualizing the changes to Phase III redevelopment areas. The modifications for this Phase III parcel are expected to be similar in scope, design, and execution to the Phase I and Phase II parcels and will be submitted to EPA and CDPHE with the Draft 95% LFGES Modification DD's discussed in Section 5.6 below.

5.3 Construction Phasing and Periodic LFGES Shutdowns

Construction sequencing has not yet been determined for this project. Site grading, MMG grout injection, replacement extraction well installation, and existing extraction well abandonment

activities will necessitate shutting down portions of the LFGES. During these shutdowns, monitoring of the perimeter LFGEWs and gas monitoring points will occur to assess potential off-site migration. The monitoring program will include the following parameters:

- GMPs - date, time, vacuum, % methane, % oxygen;
- Perimeter LFGEW - date, time, vacuum, % methane, % oxygen;

As construction schedules and sequencing is more fully developed, a Construction Phasing and LFGES Shutdown Sequencing Plan will be submitted to EPA and CDPHE for review and comment no less than 60 days prior to initiation of ground improvement activities. The final Construction Phasing and LFGES Shutdown Sequencing Plan will be submitted 15 days after EPA review and will be provided to contractors no later than 15 days prior to initiation of ground improvement activities.

The Construction Phasing and LFGES Shutdown Sequencing Plan will include the GMP and LFGEW monitoring frequency associated with the anticipated shutdowns. The scheduling of the proposed modifications to LFGES will be closely linked to the site grading and ground improvement schedules. These activities are anticipated to occur over an 18 to 24 month period, and the monitoring frequencies may be adjusted with agency notification based on the data collected during shutdowns earlier in that period.

5.4 Condensate Collection System

Condensate generated during the operation of the LFGES will be collected in sumps located at low points in the LFGES main header. The extensive proposed grade changes require the installation of an entirely new condensate collection system from the LFGEW wellfield. Condensate will be transferred from the collection sumps by submersible pumps positioned in each sump to the 10,000-gallon on-site underground storage tank (UST) located at the blower/flare unit. Discharge condensate within the UST is piped to the City of Denver sanitary sewer system. Phase III redevelopment activities are expected to require relocation of the condensate UST and re-plumbing the UST discharge to sanitary sewer line. The condition of the existing condensate UST will be evaluated after removal and the tank will either be certified for reuse by an EPA approved third party inspector or a new tank will be purchased and installed.

5.4.1 Condensate Discharge Permitting

According to information in the existing LFGES O&M manual, condensate water is discharged to the sanitary sewer under a Conditional Waste Water Discharge Permit (Permit No. S0330-1, 1991). As required by the permit, prior to discharge of the condensate to the sanitary sewer, the condensate will be sampled and analyzed for the following analytes:

- Cadmium
- Chromium

- Copper
- Lead
- Mercury
- Nickel
- Silver
- Zinc
- Cyanide
- Oil/Grease
- TCE
- PCE
- PH

The permit will be reviewed with Denver Metro Wastewater and renewed if necessary as part of the site redevelopment permit review process.

5.5 Flare Modernization/Alternate Technology Evaluation

It is anticipated that the Phase III redevelopment of the westernmost landfill parcels will require relocating the flare. The current flare system is over thirty years old. Due to its age current flare equipment will be evaluated against newer generation flare systems for compactness and combustion efficiency, as well as, against alternate capture/reuse technologies. Based on this evaluation, the existing flare equipment will either be relocated or salvaged for scrap, and a new flare unit or alternate capture technology will be purchased and installed. The flare station or alternate capture/reuse technology location will be evaluated against appropriate zoning and development requirements as part of the Phase III design. The design specifications for the new flare or alternate capture/reuse technology will be included with the draft submittal of the 95% LFGES Modification DD's for the proposed LFGES Modifications.

5.6 Draft 95% LFGES Design Drawing Set Review

Within 30 days of approval of the Work Plan, a draft of the 95% LFGES Modification Design Drawings (DD) for the proposed LFGES Modifications will be submitted to EPA and CDPHE for review. The final 100% LFGES Modification Construction Drawings for the proposed LFGES Modifications will incorporate EPA and CDPHE comments in the DD set.

5.7 Modified LFGES System Balancing and Shake Down Period

After all modifications are complete, the modified LFGES will enter into a two-month balancing and shake down period. During this period the following monitoring data will be collected from the system on a weekly basis:

- LFGEWs - date, time, vacuum, vapor velocity/flow, vapor temperature, % methane, % oxygen;

- GMPs - date, time, vacuum, vapor velocity/flow, % methane, % oxygen;
- LFGES main header at blower building - date, time, blower inlet gas temperature, blower inlet vacuum, gas flow rate, blower discharge methane concentration, blower discharge oxygen concentration, and flare temperature.

Initially a vacuum of less than 1-inch water column (wc) will be placed on all extraction wells. Wells installed along the perimeter of the system should have a vacuum of approximately ½-inch wc. These initial vacuums will be used to balance the entire system over the first two months of operation for the modified system.

After the system has been balanced and operating for at least two months, the system will begin a 10-month shakedown phase. During this period, each extraction well will be monitored bi-weekly first for methane concentration and then the well pressure. During this period, individual extraction wells will be adjusted as necessary according to the following parameters in order to optimize methane capture across the site:

1. If methane content is between 35 and 45 percent, do not change the extraction rate
2. If methane content is greater than 45 percent, increase extraction rate by opening the valve slightly.
3. If methane content is between 25 and 35 percent reduce extraction rate by closing the valve slightly
4. If methane concentration is less than 25 percent, close the extraction well.
5. Perimeter extraction wells should not be totally closed. Reduce vacuum to a minimum of 0.01 inches wc.

The adjustment parameters listed above conform with the initial adjustment parameters for the existing LFGES as identified in the associated O&M manual. These parameters represent initial set-up and adjustment conditions for the modified system. Data generated during the shakedown period will be reviewed to evaluate the effects of the replacement LFGEWs and modified system on LFG extraction as well as effects on the flare. The shakedown data will also be compared to the performance criteria and trigger levels discussed in the following section and the adjustment criteria may be modified as necessary to maintain the remedy

5.7.1 Performance Criteria and Trigger Levels.

Over the lifetime of the extraction system, similar procedures to those described in the preceding section will be used during the monthly O&M events (discussed in more detail in Section 8.0) to continuously adjust the LFGES for optimal efficiency and off-site methane migration protection. The detection of 5% methane by volume in any of the perimeter GMPs will be considered a trigger level for system adjustment. If during these O&M activities, LFG concentrations in the perimeter GMPs exceed 5% methane by volume, the LFGEWs will be adjusted, and currently closed LFGEWs may be opened in order to maintain perimeter control.

The overall performance criteria for the LFGES will continue to be maintaining methane concentrations in the perimeter GMPs below 5% methane by volume.

5.7.2 Flare Unit

During the above operations while the modified LFGES is brought online, the flare temperature will be monitored to ensure operation with manufacturer's set points for not to exceed high and high/high temperature limits.

5.7.3 Gas Monitoring Point Data Collection

During construction the perimeter gas monitoring points will be monitored concurrently with the LFGEWs. Should LFG concentrations reach 5% methane by volume in any of the monitoring points, LFGEWs will be adjusted, and closed LFGEWs may be opened in order to maintain perimeter control.

5.8 Construction Completion Report

Following completion of construction of the modified LFGES system, a construction completion report will be prepared and submitted to EPA and CDPHE for review. Components of this report are discussed in more detail in Section 11.3.

5.9 Operations and Maintenance Manual

Concurrent with construction activities for the modified LFGES, a draft of the LFGES Operations and Maintenance (O&M) manual for the site will be submitted to EPA and CDPHE for review at the time of the final inspection. The final O&M manual will be submitted with the construction completion report.

6.0 METHANE MITIGATION SYSTEMS FOR PROPOSED STRUCTURES

Prior CERCLA investigation activities and over thirty years of operation and monitoring of the existing LFGES has identified methane gas as the primary vapor intrusion threat at the site. These prior investigations did not identify potential soil contamination at the site as a source of VOCs in soil gas and the VOCs that were reported in vapor collected from the original LFGES in 1987 have been attributed to reported VOC concentrations in groundwater, the result of releases that occurred off-site at upgradient facilities. As a result of natural attenuation and remedial actions taken at these offsite sources, VOC concentrations in the groundwater have dropped significantly since system inception and methane landfill gas generated at the site remains the primary intrusion concern.

Based on the future redevelopment plans to construct up to nine commercial/industrial warehouse buildings on the landfill, there is a potential for conditions hazardous to the site buildings and occupants to occur as the result of migration of this landfill gas into the structures. The primary mitigation effort for this occurrence will be the LFGES detailed in the sections above. That system will capture and thermally treat the majority of the LFG prior to it reaching the buildings, and this system is considered to be the primary component of the EPA approved remedy for the site.

To further mitigate potential landfill gas migration into the proposed structures, the buildings will also be constructed with methane gas mitigation systems (MMS). These systems are not considered components of the approved remedy, but will be implemented in each building during construction as a backstop for migration of any methane gas not captured by the LFGES.

The MMS conceptual design for the proposed site buildings is an active sub-slab depressurization system (SSD) with a vapor intrusion barrier membrane and continuous monitoring and alarm systems.

6.1 MMS Design

Criteria used for the design of the MMS are based on following references:

- Methane Hazard Mitigation Standard Plan, 2010 (hereinafter referred to as the Los Angeles Building Code (LABC) Plan
- USEPA, 2015. Indoor Air Vapor Intrusion Mitigation Approaches
- National Electric Code
- National Standard Plumbing Code
- NFPA 72 – National Fire Alarm and Signaling Code

The conceptual design for the MMS is for an active SSD system consisting of a suitable vapor intrusion (VI) barrier membrane overlying an installed layer of air permeable material and soil gas collection system connected via vertical risers to the roof of the building. Electric blowers located on the roof of the building provide the required sub-slab vacuum. The layer of air permeable material and soil gas collection system (SGCS) will distribute the vacuum supplied by the blower beneath the concrete floor slab. The slot spacing in the SGCS could vary, i.e., decrease approaching the end of the SGCS to account for vacuum loss and more equally distribute the vacuum/flow along the longitudinal axis of the SGCS.

The following table summarizes the planned building sizes that were used in developing the conceptual design.

Building Number	Building SF	Clear Height
Building 1	162,000	32’
Building 2 North	217,080	36’
Building 2 South	63,040	28’

Building Number	Building SF	Clear Height
Building 3	244,506	36’
Building 4	93,600	28’
Building 5	60,480	28’
Building 6	93,600	TBD
Building 7	130,800	TBD
Building 8	162,800	TBD
TOTAL:	840,706	

The air permeable layer underlaying the VI membrane conceptually consists of a clean gravel or aggregate layer with a minimum thickness of 4” or a free void space. The aggregate shall be AASHTO #57 or equivalent.

Sub-slab soil gas collectors (SGC) shall be slotted SCH 40 PVC pipe or similar.

Terracon will interface with the building structural engineers and the architects to finalize SGC layout and vertical riser positioning.

The vapor barrier membrane beneath the concrete slab will consist of a reputable spray-applied liner such as GeoSeal™ or Liquid Boot™ or a reputable flexible membrane such as Stego™ or Drago™ wrap vapor barrier. Each vapor barrier membrane manufacturer has specific installation procedures and recommendations that shall be adhered to.

Terracon personnel have designed similar MMS systems and have provided construction quality assurance inspections on numerous MMS systems installed across the country. Local Terracon personnel have designed and provided construction quality oversight for several sites at the Riverpoint Development in Sheridan, which is also constructed on a former landfill, and numerous sites across the Front Range, New Mexico, and Arizona.

6.2 Draft 95% Building MMS Design Drawing Set Review

Sixty (60) days prior to submittal of individual building plans to municipal agencies for construction permitting, draft Building MMS 95% Design Drawings (DD) for the proposed Building MMSs will be submitted to EPA and CDPHE for review. The final 100% Building MMS Construction Drawings for the Building MMSs will incorporate EPA and CDPHE comment on the DD sets.

6.3 MMS Construction

Prior to construction of the MMS in each of the proposed buildings, per the design, the MMS installation contractor will submit shop drawings of equipment and materials to the MMS design engineer of record for review and approval. Observations during construction of the MMS in each building shall be made intermittently by the design engineer or designated representative. At a minimum, observations shall be made of the following:

- Sub-slab soil gas collectors and associated headers;
- 4" layer of gravel;
- MMS membrane;
- Risers on each level prior to covering with wall material;
- Vacuum blower and associated instrumentation;
- Methane sensors;
- Indoor and outdoor alarms; and
- Control panel.

6.4 MMS Operation

6.4.1 Startup

The MMS vacuum blower(s) in each of the buildings will be started and observed to ensure each blower is operating per the design. After each vacuum blower is operating, readings will be taken at the following equipment and instrumentation, as well as, inside each building:

- Vapor flow and vacuum at the inlet of each blower;
- Vacuum at the inlet of each blower cited on the control panel;
- Methane concentrations in the extracted vapors at the inlet of each blower;
- Methane concentrations at the methane sensors located within the buildings; and,
- Methane concentration in the indoor air.

Along with the collected field data, manufacturer recommended testing will be performed on the system components to assess operation of the LEL sensors, pressure sensors, strobes, and trigger alarms to ensure the Programmable Logic Controller (PLC) and control panel are operating correctly.

6.4.2 Methane Sensor Calibration

At system start up, the methane sensors will be calibrated with methane of known concentration recommended by the manufacturer to determine if the sensor is operating properly.

6.5 Building Methane Mitigation System Construction Completion Reports

Sixty (60) days after the completion of construction of each of the building MMS systems, a draft Building MMS Construction Completion Report will be prepared and submitted to EPA and CDPHE for review. The report will document the MMS construction observations, final installation layout, and the results of system start-up activities. The primary guidance document for the construction completion report will be the Colorado Department of Public Health and Environment – Hazardous Materials and Waste Management Division Vapor Intrusion Guidance Document. (https://cdphe.colorado.gov/environmental-cleanup-guidance-and-policy). Final Building MMS Construction Completion Report will be submitted to EPA and CDPHE within 30 days after EPA and CDPHE review of the draft version of the report.

6.6 Operations and Maintenance Manual

Concurrent with the completion of construction of each building's MMS system, a Building MMS O&M manual specific to that building will be prepared. A copy of the manual will be included with the submittal of each building's MMS construction completion report to EPA and CDPHE.

7.0 ENVIRONMENTAL MONITORING PROGRAM OVERVIEW

As stipulated in the ROD and EPA SOW, an environmental monitoring program shall be instituted to evaluate the effectiveness of the remedy at the landfill. The current environmental monitoring program consists of groundwater quality sampling, groundwater level monitoring, and LFGES monitoring. Each component of the environmental monitoring program is discussed in more detail in Sections 8.0 and 9.0. Building MMS monitoring will be added to the existing program and is discussed in Section 10.0. The MMSs are not considered components of the remedy, but rather design elements installed to be protective of occupants of the proposed site structures. The monitoring data collected as part of the environmental monitoring program for these systems will be submitted to EPA and CDPHE independently of the LFGES and groundwater monitoring program.

7.1 Data Quality

Prior site activities were performed under a Quality Assurance Project Plan (QAPP) prepared as part of the initial site investigation activities in the early 1980s. Moving forward, Quality assurance/quality control (QA/QC) procedures will be presented in an updated QAPP, which will be prepared by Terracon personnel and submitted to EPA for review and approval per the schedule set forth in Section 13.0.

The QAPP will be prepared consistent with the EPA Requirements for Quality Assurance Plans, EPA QA/R-5, March, 2001", (EPA, 2001 and 2006), and will include sampling methods, analytical methods, sample management, documentation procedures, and quality assurance (QA) review procedures that will be applicable to the ongoing environmental monitoring program at the site as well as potential sampling activities that may be required during redevelopment activities.

The QAPP will be reviewed and updated as necessary over the course of the project to account for changing conditions at the site during, and after, construction.

7.2 Data management

Data collected as part of the environmental monitoring program will be entered into a computerized database to facilitate retrieval, handling, and analysis. Information stored in the computerized database will, at a minimum, include the following:

- Well identification and construction information;
  (Well ID, Top of Casing, Top of Screen, Bottom of Screen)
- Well Location Information;
  (Latitude, Longitude, Elevation)
- Water Level measurements;
- Groundwater Sample information;
  (Sample ID, Date Collected, Type, Analytical Results and Data Qualifiers)
- Landfill Gas measurements;
  (Date, Time, % Methane, % Oxygen, LFG Temperature, Well Vacuum, and LFG Flow Velocity)
- Building MMS measurements; and,
  (Date, Time, Blower Inlet Vacuum, Gas Flow Rate, Blower Inlet Methane Concentration, Combustible Gas Levels at Building Sensors, Methane Concentration in Indoor Air)
- Flare Performance
  (Date, Time, Bower Inlet Gas Temperature, Blower Inlet Vacuum, Gas Flow Rate, Blower Discharge Methane Concentration, Blower Discharge Oxygen Concentration, and Flare Temperature)

Data will be entered into the database via keyboard or through Electronic Data Deliverables (EDDs) provided by the analytical laboratory and will be entered into the database when received. Database editing privileges will be restricted to authorized personnel. Electronic data will be backed up at regular intervals and following data input events.

8.0 LFGES MONITORING PROGRAM

The existing system has operated for more than 30 years and the sampling and analysis procedures performed to date will be continued through the LFGES modification into the post-redevelopment LFGES monitoring program.

8.1 Data Collection

Before initiating monitoring activities, a field evaluation of the extraction wells and gas monitoring points will be performed. Quality assurance/quality control (QA/QC) procedures to be followed will be described in the Quality Assurance Project Plan (QAPP). Health and Safety guidelines are described in HASP (**Appendix 6 of the PPA**). The QAPP and HASP will be reviewed and updated as necessary to account for changing conditions at the site during construction.

8.1.1 Extraction Well Monitoring Parameters

Similar to the past and current O&M program, extracted LFG will be monitored monthly at the LFGEWs. Monitoring will include the field collection of the following parameters:

- Date;
- Time;
- % methane;
- % oxygen;
- LFG temperature;
- Well vacuum; and,
- LFG flow velocity

8.1.2 Gas Monitoring Point Parameters

Similar to the past and current, O&M program, the twenty-eight gas monitoring points (GMPs) installed around the perimeter will be monitored bi-weekly. Monitoring will include the field collection of the following parameters:

- Date;
- Time;
- % methane;
- % oxygen; and,
- Well vacuum

8.1.3 Flare Monitoring Parameters

Similar to the past and current, O&M program, monitoring of the flare station will be conducted weekly and include the following:

- Date;
- Time;
- Bower inlet gas temperature;
- Blower inlet vacuum;
- Gas flow rate;
- Blower discharge methane concentration;
- Blower discharge oxygen concentration; and,
- Flare temperature

9.0 GROUNDWATER MONITORING PROGRAM

As specified in the ROD, EPA SOW, and Work Plan/Remedial Design Report (HLA, 1994), a groundwater monitoring program has been implemented at the site as part of the approved remedy. The hydrogeologic conceptual model of the site, groundwater monitoring locations, nature, frequency of monitoring and data collection, data evaluation, and data management activities for the groundwater monitoring program are described in the 1994 HLA Work Plan/Remedial design report included in **Appendix B**.

The objective of the groundwater monitoring program as set forth in the HLA Work Plan is to:

- Evaluate changes in groundwater quality downgradient of the Landfill within Aquifers 0 and 2;
- If changes are observed, evaluate whether these changes are related to impacts from the Landfill.

Per the HLA workplan, EPA SOW, and ROD, the nine existing monitoring wells will continue to be sampled on an annual basis. The nine existing monitoring wells are listed below and their approximate locations are identified on **Figure 7**:

Upgradient Wells (East to West)			Downgradient Wells (East to West)					
FIT-MW3	L-2	SC-2B	L-15	L-4	L-14	SC-9C	L-3	SC-5B

Concurrently with the monitoring well samples, one water sample will be collected from the location of the groundwater discharge to the surface water spring located in the northern corner of the site (**Figure 6)**.

9.1 Data Collection

Before initiating monitoring activities, a field evaluation of the monitoring wells will be performed. Previously established sampling and analysis procedures will be followed during implementation of the groundwater monitoring program. QA/QC procedures to be followed will be described in the QAPP . Health and Safety guidelines are described in HASP **(Appendix 6 of the PPA)**. The QAPP and HASP will be reviewed and updated as necessary to account for changing conditions at the site.

9.1.1 Water Level Measurements

Water level data will be measured in the nine monitoring wells upgradient and downgradient of the Landfill. Per prior workplans, water level measurements will be recorded annually concurrent with the groundwater sampling event and prior to well purging. Water levels will be measured with an electronic water level meter and will be recorded to an accuracy of 0.01 feet.

9.1.2 Groundwater Sampling and Chemical Analysis

Groundwater samples will be collected annually from the nine-groundwater monitoring wells and at the groundwater discharge to surface location. Each well will be purged prior to collecting the groundwater samples. Aquifer parameters will be monitored during purging activities and purging will continue until aquifer parameters have stabilized. Groundwater samples will be collected from the well as soon as possible after the completion of purge activities. A grab water sample will be collected from the groundwater discharge to surface location. The water samples will be collected and preserved in accordance with the sampling procedures set forth in the approved QAPP.

The collected water samples will be shipped to a certified analytical laboratory and analyzed for the following:

- **Volatile organic compounds**
  Benzene
  1,1-Dichloroethene (1,1-DCE)
  1,2-Dichloroethene (1,2-DCE)
  Tetrachloroethene (PCE)
  1,1,1-Trichloroethane (1,1,1-TCA)
  Trichloroethene (TCE)
  Vinyl chloride (VC)

- **Dissolved metals**
  Manganese (Mn)

10.0 BUILDING MMS MONITORING PROGRAM

Monitoring of the Building MMS's will be added to the environmental monitoring program. It is expected that this monitoring will occur quarterly concurrent with each building's methane gas sensor calibration events.

10.1 Data Collection

Before initiating monitoring activities, O&M personnel will check the condition of the blowers, sampling ports, and methane sensors. If repairs are necessary, O&M personnel will inform the O&M PM and/or the Building Owner if immediate repairs are needed or if the repairs can be scheduled for the next site visit.

QA/QC procedures to be followed for building MMS O&M will be included in the updated QAPP. Health and Safety guidelines are described in HASP. The QAPP and HASP will be reviewed and updated as necessary to account for changing conditions at the site.

10.1.1 Quarterly Sensor Calibration

Field personnel will calibrate the methane sensors on a quarterly basis unless the manufacturer prescribes a shorter interval. The methane sensors will be calibrated with methane of known concentration recommended by the manufacturer to determine if the sensors are operating properly.

10.1.2 Quarterly Monitoring

Quarterly monitoring of each MMS will include readings taken at the following equipment and instrumentation, as well as inside each site building:

- Vapor flow and vacuum at the inlet of each blower;
- Methane concentrations in the extracted vapors at the inlet of each blower;
- Methane concentrations at the methane sensors; and,
- Methane concentration in the indoor air using hand-held calibrated units.

Field data will be recorded on O&M log sheets for each building. The log sheets will be maintained and submitted to EPA and CDPHE annually with the annual O&M reports for the buildings.

10.2 Operations and Maintenance Reports

O&M Reports for the Building MMS systems will be prepared and submitted annually to EPA and CDPHE on or before December 31th. The annual Building MMS O&M Reports will include as a minimum:

- Description of O&M activities performed during the reporting period;
- Summary of the results of the MMS monitoring data and the blower exhaust data and assessment as to whether contingency measures are necessary;
- Identification of any problems or potential problems and a description of the steps taken or recommendations for actions needed to rectify the identified problem;

11.0 REPORTING

Per the ROD, EPA SOW, and this Work Plan, the following reports will be prepared for the site. Two of the reports, the annual Operations and Maintenance (O&M) report and the five-year review report are required by the ROD and EPA SOW for long-term documentation of the effectiveness of the selected remedies.

11.1 Quality Assurance Project Plan

Prior site activities were performed under a Quality Assurance Project Plan (QAPP) prepared as part of the initial site investigation activities in the early 1980s. Moving forward, Quality assurance/quality control (QA/QC) procedures will be presented in an updated QAPP, which will be prepared by Terracon personnel and submitted to EPA for review and approval per the schedule set forth in Section 13.0.

The QAPP will be prepared consistent with the EPA Requirements for Quality Assurance Plans, EPA QA/R-5, March, 2001", (EPA, 2001 and 2006), and will include sampling methods, analytical methods, sample management, documentation procedures, and quality assurance (QA) review procedures that will be applicable to the ongoing environmental monitoring program at the site as well as potential sampling activities that may be required during redevelopment activities.

The QAPP will be reviewed and updated as necessary over the course of the project to account for changing conditions at the site during, and after, construction.

11.2 Construction Progress Reports

While site construction is ongoing, progress reports detailing project events will be developed monthly and include the following information:

- Progress made during the reporting period;
- Identified problem(s) and their resolution(s), and/or recommended actions or activities to resolve the issue(s);
- Deliverables;
- Schedule updates;
- Planned activities for the next reporting period;
- Key personnel changes; and
- Applicable monitoring or analytical data.
- Tracking of Environmental Justice, Equitable Development, and Sustainability Initiative expenditures against the 1% commitment (sample spreadsheet attached as **Appendix F**).

Monthly progress reports will be due on the 10th day of each month

11.3 Landfill Gas Extraction System Modification Construction Completion Report

Sixty (60) days after completion of the modifications to the landfill gas extraction system, a draft LFGES Modification Construction Completion Report will be submitted to EPA and CDPHE. The primary guidance document for the LFGES Modification Construction Completion Report will be the most recent version of the EPA Publication 9320.2-22, Close Out Procedures for Nation Priorities List Sites. The final LFGES Modification Construction Completion Report will be submitted to EPA and CDPHE within 30 days after EPA and CDPHE review of the draft version of the report. The report will include as a minimum:

- Summary of site grading activities and modifications;
- Description of excavated waste material handling activities and final waste material disposition;
- Summary of LFGES construction activities;
- QA/QC assessment of LFGES construction;
- Summary and qualitative evaluation of the LFGES monitoring data and assessment as to whether contingency measures are necessary; and,
- Identification of any problems or potential problems and a description of the steps taken or recommendations for actions needed to rectify the identified problem.

11.4 Well Abandonment Reports

The EPA SOW requires a well abandonment report be prepared for groundwater monitoring wells abandoned at the site. Provisions for preparing and submitting well abandonment reports are included in this work plan in accordance with the overall EPA SOW for OU3 and OU6.

The well abandonment report required by the Colorado State Engineers Office (Form No. GWS-9) with field forms attached will be submitted concurrently to EPA and CDPHE within 60 days after completion of any groundwater monitoring well abandonment activities as specified in the EPA SOW.

Groundwater monitoring wells are not expected to be impacted as part of site redevelopment activities. However, in the case of any monitoring well abandonment, EPA and CDPHE have the discretion to require installation of a replacement monitoring well in the vicinity.

11.5 Operations and Maintenance Reports

The Annual O&M Report for the LFGES will maintain the current reporting schedule. The report will be prepared and submitted annually to EPA and CDPHE on or before December 10th of each year. The Annual O&M Report will include as a minimum:

- Description of O&M activities performed during the reporting period;
- Assessment of the performance of each component of the remedy requiring O&M;
- Summary of the results of the LFGES monitoring data and assessment as to whether contingency measures are necessary;
- Summary and qualitative evaluation of the groundwater monitoring data and assessment as to whether contingency measures are necessary;
- Identification of any problems or potential problems and a description of the steps taken or recommendations for actions needed to rectify the identified problem;
- Appendix containing validated Form Is or similar for the laboratory analytical samples collected during the reporting period; and,
- Digital groundwater monitoring data in a format suitable for input in the existing Sand Creek Groundwater Database.

11.6 Data Summary Report in Support of EPA Five-Year Review

Every five years, EPA and CDPHE collaborate to prepare a review report for the larger Sand Creek Industrial Superfund Site with official protectiveness determinations and recommendations as to the effectiveness of the approved remedies. In support of this five-year review report, Triangle Logistics Center, LLC will provide EPA and CDPHE environmental monitoring program data and site activity and site condition summaries in the form of a Data Summary Report specific to the 48th and Holly Landfill OUs. This supporting report will be submitted to EPA and CDPHE on or before June 1, 2025, and on or before the same date every five years until the completion

of the prescribed site remedies. The Triangle Logistics Center, LLC provided Data Summary Report will include the following:

- Purpose and scope;
- Site history;
- Remedial objectives;
- Components of the selected remedy;
- Summary of results and site conditions during review period;
  - LFGES
  - Groundwater
- Summary of remedial activities performed during review period;
  - LFGES O&M
  - Soil cover maintenance
  - Environmental monitoring
  - Institutional controls
- Interpretation of monitoring data; and
  - LFGES monitoring data
  - Water level measurements
  - Groundwater analytical results

To the extent practicable, Triangle Logistics Center, LLC will endeavor to submit the validated sampling data collected during the reporting year to EPA and CDPHE in advance of the Data Summary Report.

12.0 ENVIRONMENTAL JUSTICE, EQUITABLE DEVELOPMENT, AND GREEN INITIATIVES

The site is located in an historically industrial and blighted area of Commerce City and currently is fenced and vacant. Development of the site will improve access and connectivity in this area of both cities generally through investment in infrastructure and will improve public safety. The development itself also is projected to generate 2,600 construction and engineering related jobs during construction, which will be filled locally in the community to the extent commercially feasible. Additionally, businesses operating in the development are projected to generate 840 direct and 2,300 indirect permanent jobs.

As enunciated by EPA, “equitable development is driven by priorities and values as well as clear expectations that the outcomes from development need to be responsive to underserved populations and vulnerable groups, in addition to using innovative design strategies and sustainable policies. Acknowledging and understanding both is necessary for sustaining environmental justice.” Additionally, equitable development should attempt to enhance the general economic development of the community. As such, proposed redevelopment planning

will incorporate design strategies and sustainable features intended to support environmental justice and to demonstrate equitable and sustainable redevelopment principles.

To this end, $620,000 (1% of the estimated vertical construction cost of the TLC redevelopment) will be allocated to features that benefit the project and will support environmental justice, equitable development, and sustainability initiatives. Triangle Logistics Center, LLC in consultation with EPA and CDPHE will maintain a tracking sheet of the portion of the Environmental Justice, Equitable Development, and Sustainability initiative costs that qualify against the 1% commitment. As discussed in Section 11.2, Triangle Logistics Center, LLC will report the qualifying percentage of costs against the 1% commitment to CDPHE and EPA in the monthly construction reports.

The following list is not considered all inclusive, but presents potential environmental justice, equitable development, and sustainability initiatives that may be included with community and regulatory input provided as part of the Commerce City and the City and County of Denver development permitting and design approval process, and in consultation with EPA and CDPHE representatives.

Potential Environmental Justice, Equitable Development, and Sustainability Initiatives

- Landfill Gas Extraction System modification and replacement with more efficient technology
- Replace Flare Station with updated technology to further reduce greenhouse gas emission
- Reuse landfill gas for supplemental energy
- Install EV charging stations or electrical infrastructure to allow for future flexibility
- Reflective roofing for reduced heat island effect
- Site lighting pollution reduction
- Provide electrical connectors at loading dock doors to reduce truck idling near the building
- Onsite stormwater management using low impact and green infrastructure practices
- Reclaim water for irrigation and/or install programmable irrigation control systems with rain detectors to minimize potable water consumption and runoff
- Native and Adaptive Landscaping
- Install bike racks and shower facilities in buildings to encourage low impact transportation
- Improve street level public transportation access/amenities (currently there are 5 bus stops on 48th for #37 bus routes and 3 bus stops on Dahlia for #49 bus route)
- Roof solar panels to generate electricity and possible redistribution to grid
- Commissioning of energy and water using building features
- Variable Refrigerant or High Efficiency Packaged DX Equipment for conditioned spaces
- High efficiency LED lighting
- Install motion sensors and automatic shut off for interior lighting

- Drip irrigation along building foundation areas to minimize water consumption, which also reduces runoff and water infiltration by eliminating overspray.
- Add heat exchanger in Flare Station to generate heat and/or hot water for buildings
- Work with Contractor to include language in sub-contracts to limit truck idle time
- Establish hours of truck traffic during the construction and development phases

13.0 SCHEDULE

The summary of submittals and scheduled timeframes are presented in Tables 13.1 and 13.2 below. Specific project planning dates have been included in the schedules as reference milestones, for review and project timeframe understanding, but are not intended to be commitments.

Table 13.1
Submittal Schedule

	Submittal Description	Schedule Date
	Quality Assurance Project Plan	30 days following approval of the workplan
	Draft 95% LFGES Modification Design Drawings	30 days following approval of the workplan
	EPA Review of Draft 95% LFGES Modification Design Drawings	45 days following receipt of design package
	100% LFGES Modification Construction Drawings (Reference date)	May 15, 2022*
	100% LFGES Modification Construction Drawings to Contractors	30 days prior to construction commencement
	Draft Construction Phasing and LFGES Shutdown Sequencing Plan	60 days prior to initiation of Injection activities.
	EPA Review of Construction Phasing and LFGES Shutdown Sequencing Plan	45 days following receipt of draft construction phasing plan
	Issue Final Construction Phasing and LFGES Shutdown Sequencing Plan to Contractors	No less than 15 days prior to initiation of Injection activities.
	Planned Commencement of Ground Improvement Activities (Reference date)	May 1, 2022*
	Planned Commencement of Earthwork Activities (Reference date)	June 1, 2022*
	Planned Commencement of Building Construction (Reference date)	October 1, 2022*
	Construction Progress Reporting	10th day of each month during construction (Monthly)

	Table 13.1 Submittal Schedule	
	Submittal Description	**Schedule Date**
	Draft LFGES Modification Construction Completion Report	60 days after construction completion
	Final LFGES Modification Construction Completion Report	30 days after EPA review
	Draft LFGES O&M Manual	At system startup
	Final LFGES O&M Manual	30 days after EPA review
	Groundwater Monitoring Well Abandonment Reports (if necessary)	60 days after well abandonment
	Annual O&M Report	On or before December 10th (Annually)
	Data Summary Report	On or before June 1, 2025 (recurring every 5-years)

* Specific dates are included in the schedule for reference and review schedule coordination, but not intended to be used as committed milestones.

Table 13.2 includes submittal schedules associated with the MMSs to be included with the site buildings constructed at the site. The MMSs are not considered components of the remedy, but rather design elements installed to be protective of occupants of the proposed site structures.

	Table 13.2 Submittal Schedule	
	Submittal Description	**Schedule Date**
	Draft Building MMS 95% Design Drawings	60 days prior to submittal of building plans for construction permitting
	EPA Review of Draft Building MMS 95% Design Drawings	45 days following receipt of building design packages
	Planned Commencement of Building Construction (Reference date)	October 1, 2022*
	Draft Building MMS Construction Completion Reports	60 days after MMS construction completion
	Final Building MMS Construction Completion Reports	30 days after regulatory review
	Draft Building MMS O&M Manuals	At each building system startup
	Final Building MMS O&M Manual	30 days after regulatory review
	Annual Building MMS O&M Reports	On or before December 31th (Annually)

14.0 COST SUMMARY

The summary of estimated capital costs for the modifications to the existing LFGES are presented in Table 14.1 along with the estimated annual O&M costs for LFGES operation and the ongoing environmental monitoring program. These cost estimates were prepared based on a combination of engineers estimates using RMS Means and bid solicitation from local vendors.

Table 14.1
Summary of Estimated Costs

Capital Cost Breakdown	
LFGES Modification Capital Costs (Phase I and Phase II)	**$1,500,000**
LFGES Modification Capital Costs (Phase III)	**$1,000,000**
Flare Replacement Capital Costs (Phase III)	**$370,000**
Total Capital Costs	**$2,870,000**
O&M Cost Breakdown	
Estimated Annual LFGES O&M and Reporting Costs	**$150,000**
Estimated Annual Groundwater Monitoring and Reporting Costs	**$35,000**
Total O&M Costs	**$185,000**
Present Value (2021 $)[1]	**$2,295,000**
Admin, Legal, Insurance, Bond, Permits, Fees, Misc (estimated 15%)	**$431,000**
Landfill Restoration Costs	**$901,000**
Total Present Value (2021 $)[1]	**$6,497,000**

[1]Assumes an annual discount rate of 7% and a project duration of 30yrs.

Table 14.2 includes anticipated costs associated with the MMSs to be included with the site buildings constructed at the site. The MMSs are not considered components of the remedy, but rather design elements installed to be protective of occupants of the proposed site structures. The summary includes the estimated capital costs and the estimated annual O&M costs associated with each of the identified tasks.

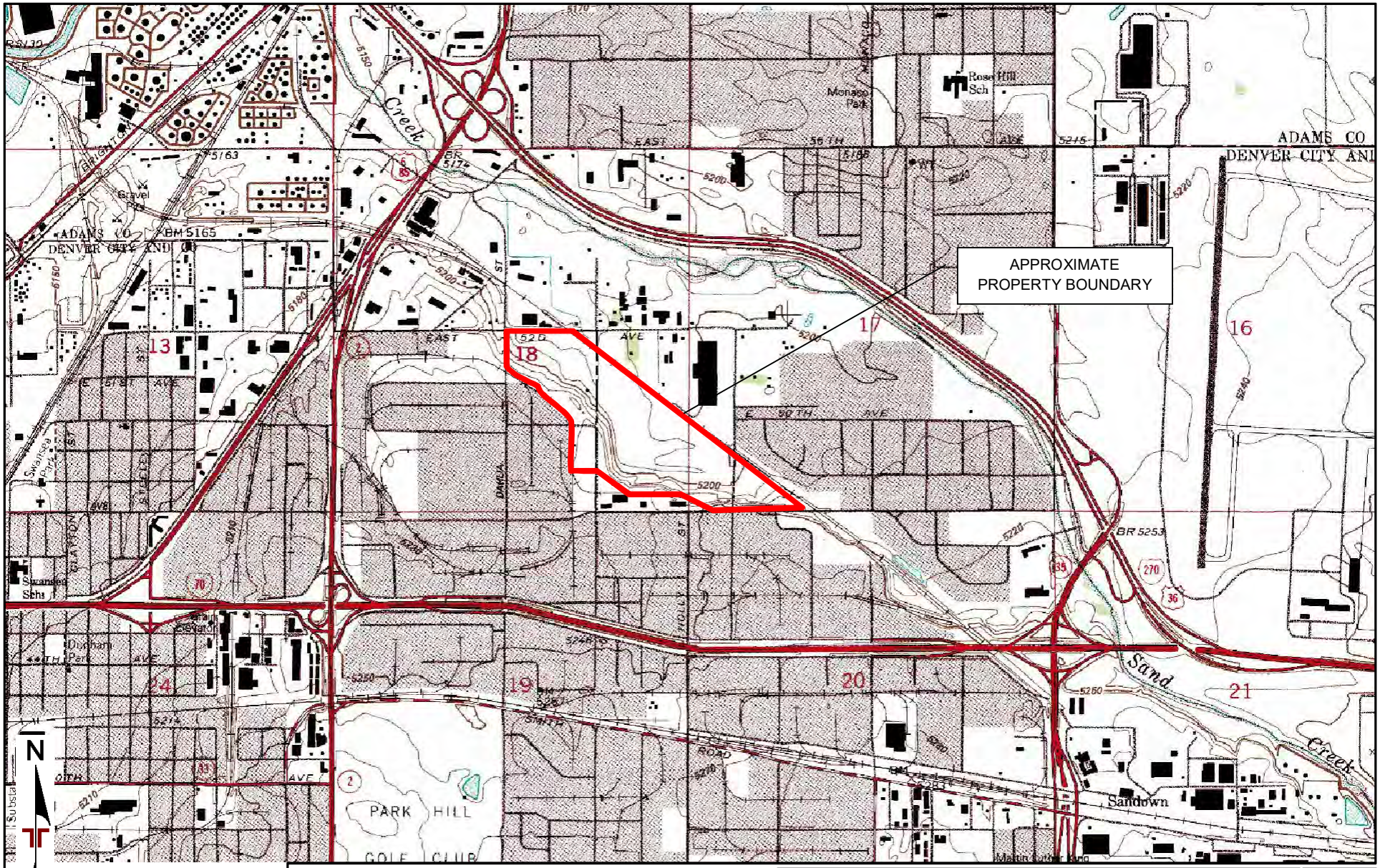
Table 14.2
Summary of Estimated Building MMS Costs

Capital Cost Breakdown	
Building MMS System Installation Capital Costs (Phase I and Phase II)	**$3,910,000**
Building MMS System Installation Capital Costs (Phase III)	**$1,800,000**
Total Capital Costs	**$5,710,000**

Table 14.2 Summary of Estimated Building MMS Costs	
O&M Cost Breakdown	
Estimated Annual Building MMS O&M and Reporting Costs*	**$150,000***
Present Value (2021 $)[1]	**$1,862,000**
Admin, Legal, Insurance, Bond, Permits, Fees, Misc (estimated 15%)	**860,000**
Total Present Value (2021 $)[1]	**$8,432,000**

[1]Assumes an annual discount rate of 7% and a project duration of 30yrs.

FIGURES



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY QUADRANGLES INCLUDE: COMMERCE CITY, CO (1/1/1994).

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

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

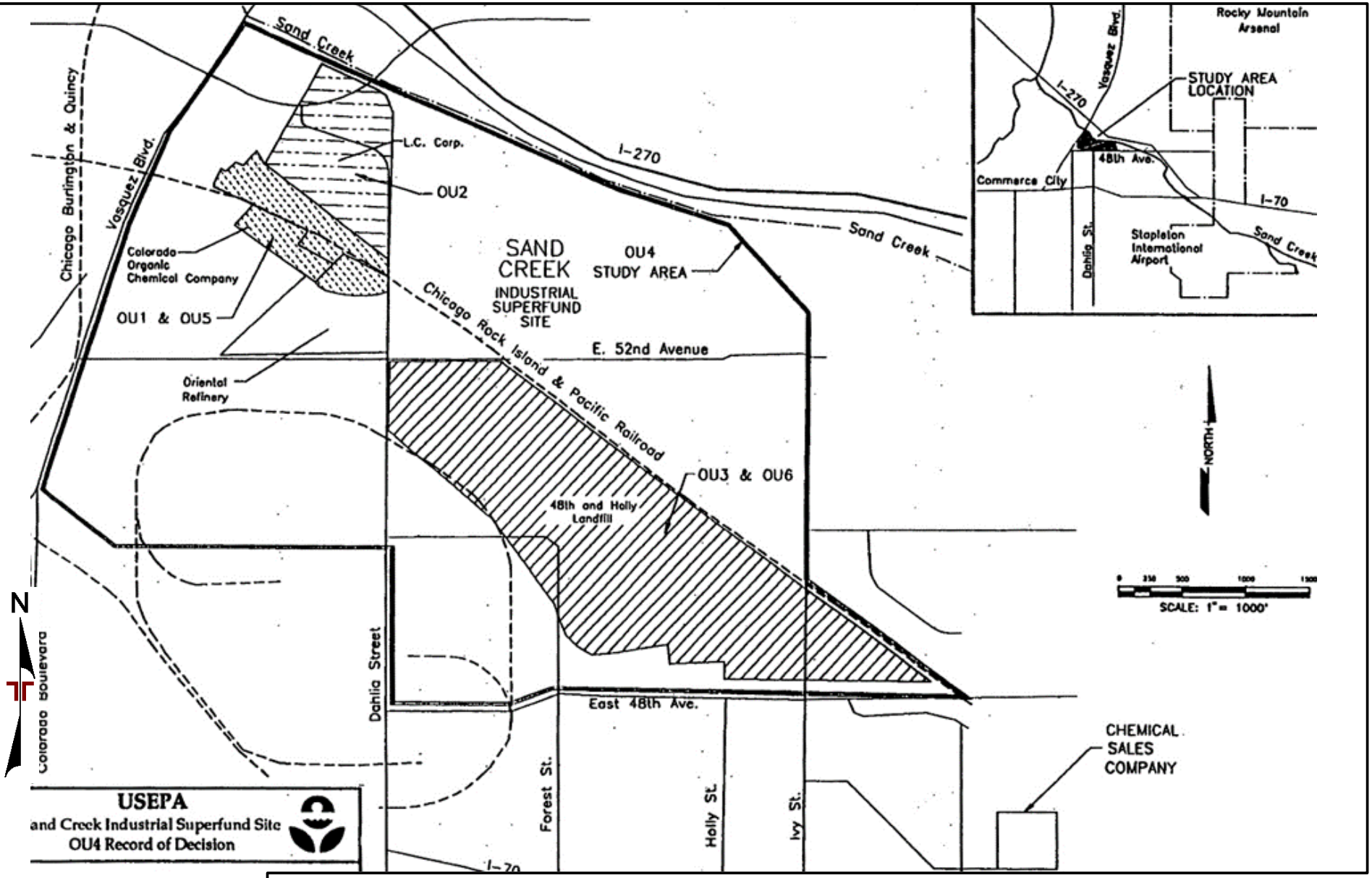
Project No.	25207313
Scale:	1"=2,000'
File Name:	EXHIBITS
Date:	3/9/2022

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

SITE LOCATION MAP

Landfill Gas Extraction System Modifications
CAI Industrial Holdings, LLC
Triangle Logistics Center
Commerce City Colorado

Figure 1



Map Source: Figure 1. Sixth Five-Year Review Report For Sand Creek Industrial Superfund Site City and County of Denver and Commerce City, Coloraod – Prepared by US EPA 09.28.2020

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Project No.	25207313
Scale:	AS SHOWN
File Name:	EXHIBITS
Date:	12/6/2021

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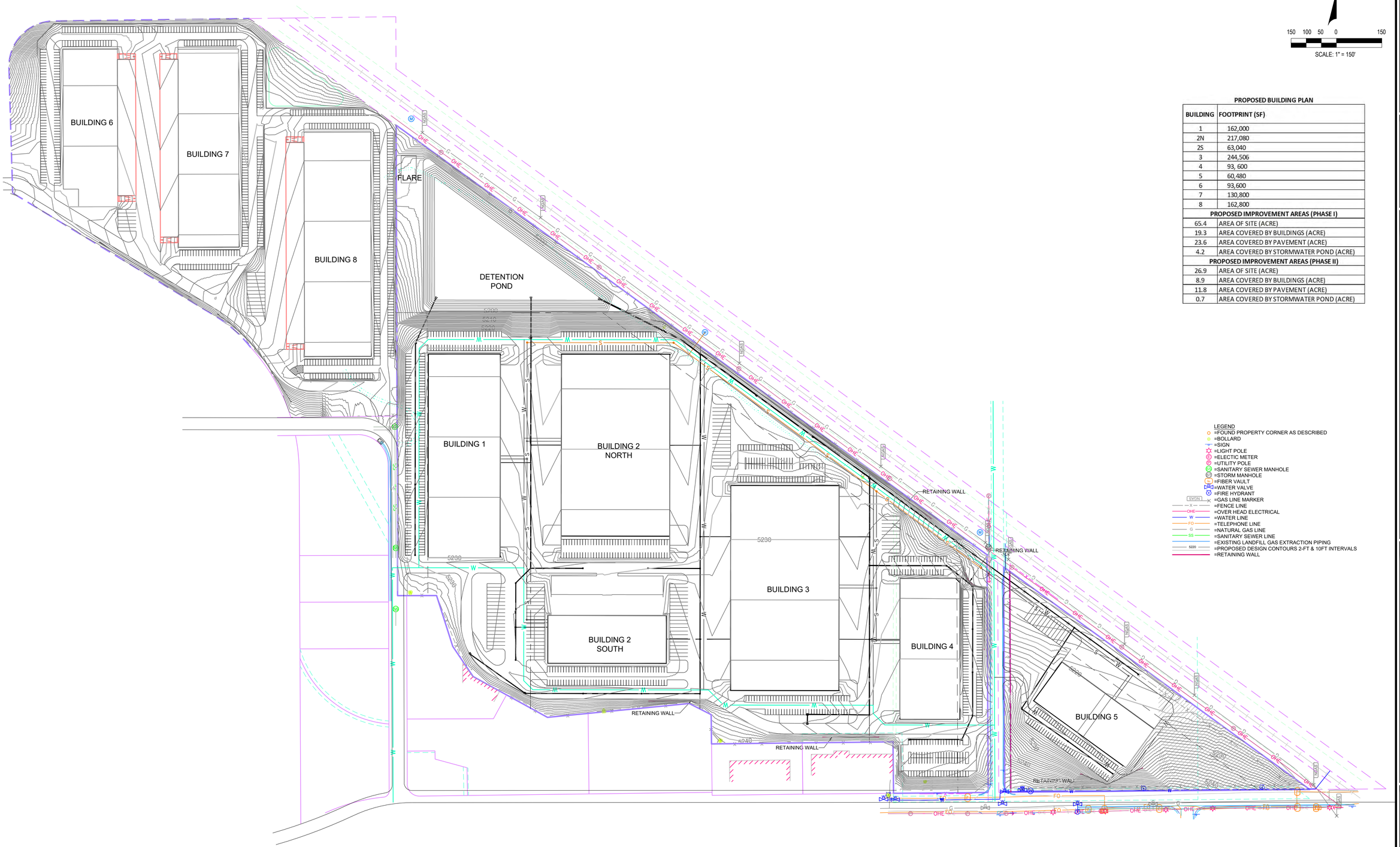
Wheat Ridge, CO 80033-1729

SAND CREEK INDUSTRIAL SUPERFUND SITE

Landfill Gas Extraction System Modifications
CAI Industrial Holdings, LLC
Triangle Logistics Center
Commerce City Colorado

Figure 2



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150 100 50 0 150

SCALE: 1" = 150'

PROPOSED BUILDING PLAN

BUILDING	FOOTPRINT (SF)
1	162,000
2N	217,080
2S	63,040
3	244,506
4	93, 600
5	60,480
6	93,600
7	130,800
8	162,800

PROPOSED IMPROVEMENT AREAS (PHASE I)	
65.4	AREA OF SITE (ACRE)
19.3	AREA COVERED BY BUILDINGS (ACRE)
23.6	AREA COVERED BY PAVEMENT (ACRE)
4.2	AREA COVERED BY STORMWATER POND (ACRE)
PROPOSED IMPROVEMENT AREAS (PHASE II)	
26.9	AREA OF SITE (ACRE)
8.9	AREA COVERED BY BUILDINGS (ACRE)
11.8	AREA COVERED BY PAVEMENT (ACRE)
0.7	AREA COVERED BY STORMWATER POND (ACRE)

REV.	DATE	BY	DESCRIPTION

PROPOSED REDEVELOPMENT PLAN (PHASE I AND II)

LANDFILL GAS EXTRACTION SYSTEM MODIFICATIONS

CA INDUSTRIAL HOLDINGS, LLC

TRIANGLE LOGISTICS CENTER

COMMERCE CITY COLORADO

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FIGURE 3

DESIGNED BY:	TLB
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SCALE:	AS SHOWN
DATE:	09/29/2021
JOB NO.	25207313
ACAD NO.	002
SHEET NO.:	3 OF 7

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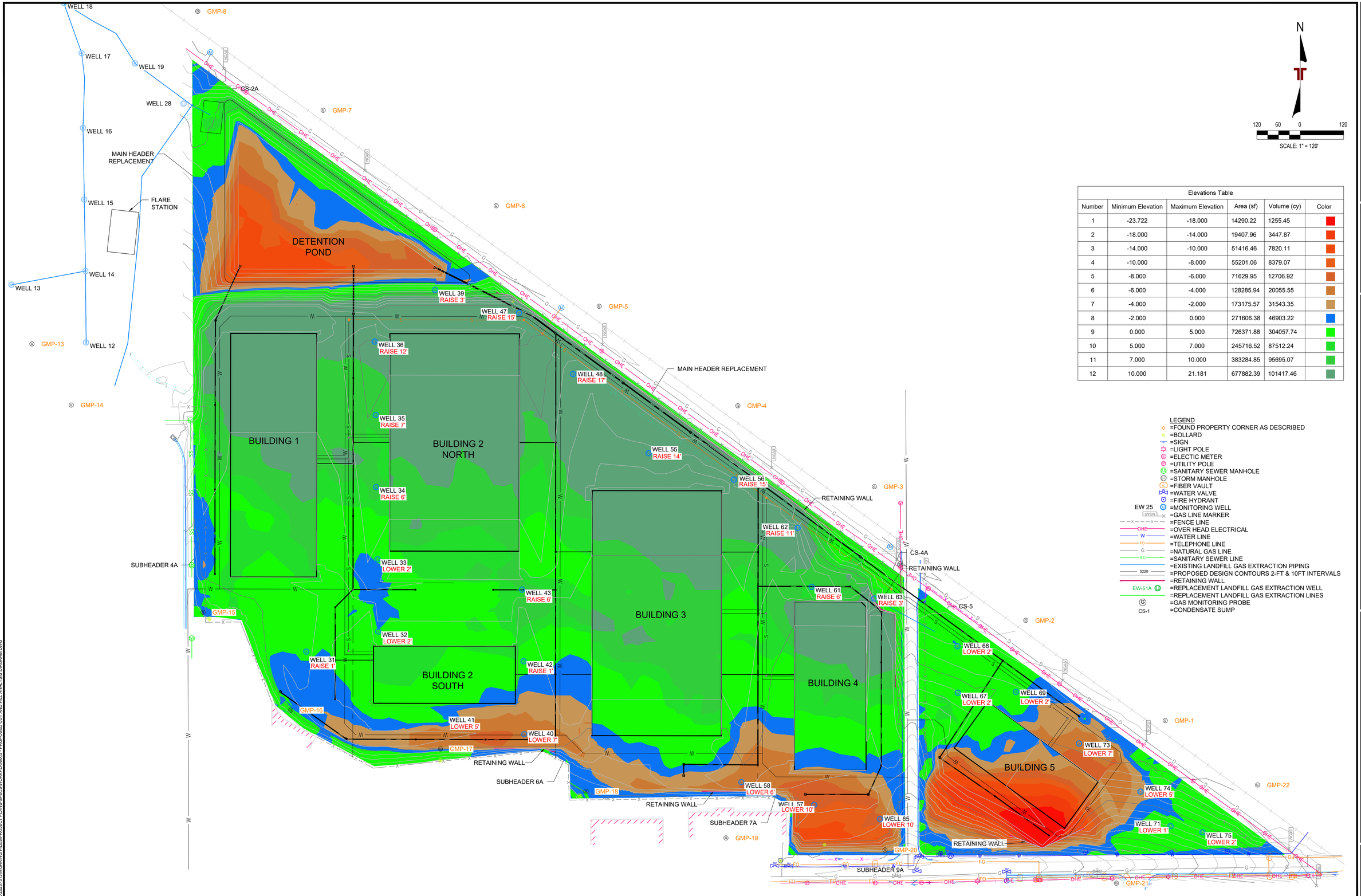

Elevations Table					
Number	Minimum Elevation	Maximum Elevation	Area (sf)	Volume (cy)	Color
1	-23.722	-18.000	14290.22	1255.45	
2	-18.000	-14.000	19407.96	3447.87	
3	-14.000	-10.000	51416.46	7820.11	
4	-10.000	-8.000	55201.06	8379.07	
5	-8.000	-6.000	71629.95	12706.92	
6	-6.000	-4.000	128285.94	20055.55	
7	-4.000	-2.000	173175.57	31543.35	
8	-2.000	0.000	271606.38	46903.22	
9	0.000	5.000	726371.88	304057.74	
10	5.000	7.000	245716.52	87512.24	
11	7.000	10.000	383284.85	95695.07	
12	10.000	21.181	677882.39	101417.46	

LEGEND
- =FOUND PROPERTY CORNER AS DESCRIBED
- =BOLLARD
- =SIGN
- =LIGHT POLE
- =ELECTIC METER
- =UTILITY POLE
- =SANITARY SEWER MANHOLE
- =STORM MANHOLE
- =FIBER VAULT
- =WATER VALVE
- =FIRE HYDRANT
- EW 25 =MONITORING WELL
- =GAS LINE MARKER
- =FENCE LINE
- =OVER HEAD ELECTRICAL
- =WATER LINE
- =TELEPHONE LINE
- =NATURAL GAS LINE
- =SANITARY SEWER LINE
- =EXISTING LANDFILL GAS EXTRACTION PIPING
- =PROPOSED DESIGN CONTOURS 2-FT & 10FT INTERVALS
- =RETAINING WALL
- EW-51A =REPLACEMENT LANDFILL GAS EXTRACTION WELL
- =REPLACEMENT LANDFILL GAS EXTRACTION LINES
- =GAS MONITORING PROBE
- CS-1 =CONDENSATE SUMP

REV.	DATE	BY	DESCRIPTION

PROPOSED CUT / FILL ANALYSIS DIAGRAM (PHASE I AND PHASE II)

LANDFILL GAS EXTRACTION SYSTEM MODIFICATIONS

CA INDUSTRIAL HOLDINGS, LLC

TRIANGLE LOGISTICS CENTER

COMMERCE CITY COLORADO

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FIGURE 3

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JOB NO.	25207313
ACAD NO.	003
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APPROVED BY:	DCR/MEW
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JOB NO.	2520731
ACAD NO.	004
SHEET NO.:	5 OF 7

FIGURE 5

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EXISTING LFGES AND GAS MONITORING PROBES

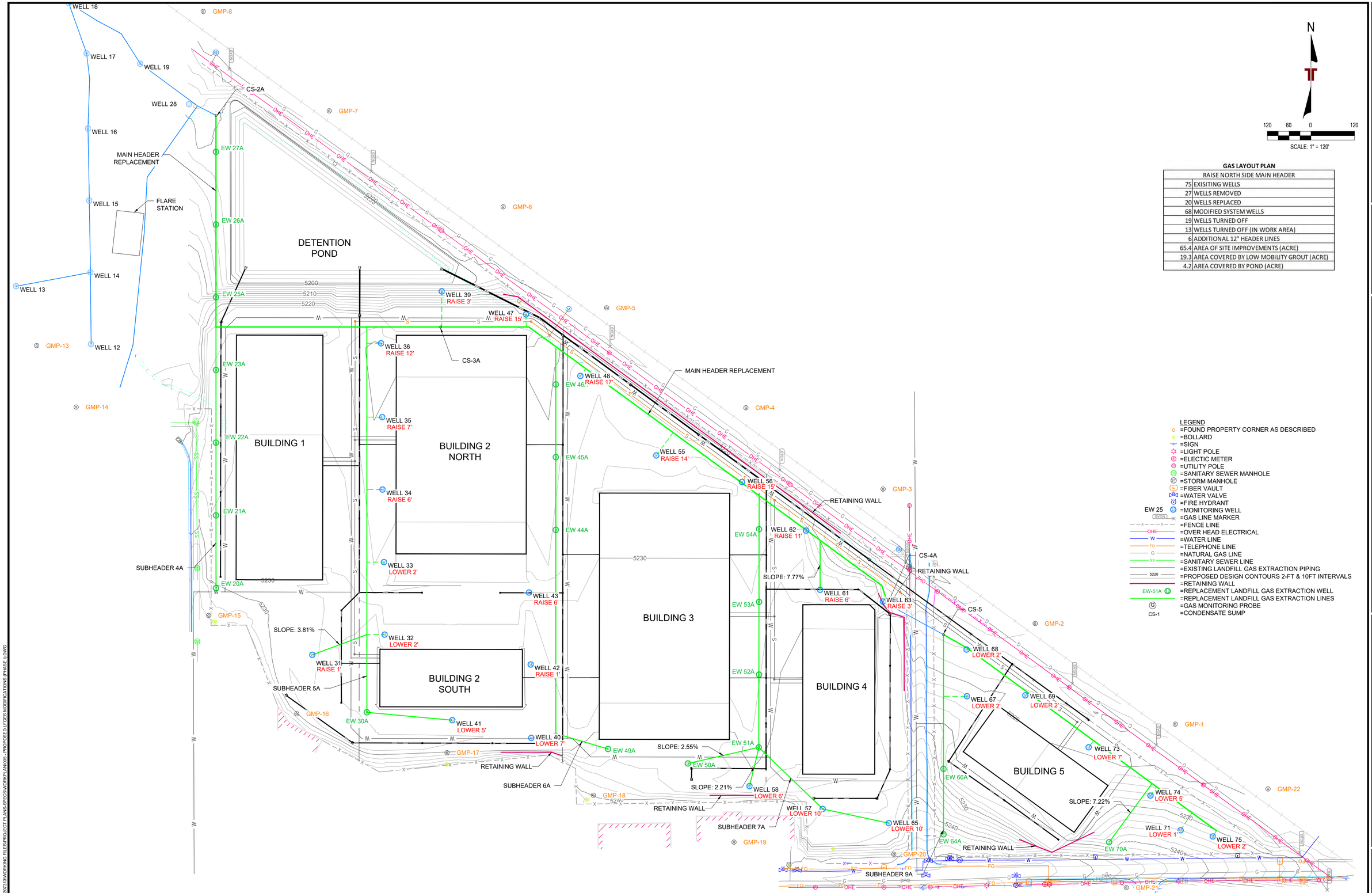
LANDFILL GAS EXTRACTION SYSTEM MODIFICATIONS

CA INDUSTRIAL HOLDINGS, LLC

TRIANGLE LOGISTICS CENTER

COMMERCE CITY COLORADO

REV.	DATE	BY	DESCRIPTION



GAS LAYOUT PLAN

	RAISE NORTH SIDE MAIN HEADER
75	EXISITING WELLS
27	WELLS REMOVED
20	WELLS REPLACED
68	MODIFIED SYSTEM WELLS
19	WELLS TURNED OFF
13	WELLS TURNED OFF (IN WORK AREA)
6	ADDITIONAL 12" HEADER LINES
65.4	AREA OF SITE IMPROVEMENTS (ACRE)
19.3	AREA COVERED BY LOW MOBILITY GROUT (ACRE)
4.2	AREA COVERED BY POND (ACRE)

LEGEND
- =FOUND PROPERTY CORNER AS DESCRIBED
- =BOLLARD
- =SIGN
- =LIGHT POLE
- =ELECTIC METER
- =UTILITY POLE
- =SANITARY SEWER MANHOLE
- =STORM MANHOLE
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- =RETAINING WALL
- EW-51A =REPLACEMENT LANDFILL GAS EXTRACTION WELL
- =REPLACEMENT LANDFILL GAS EXTRACTION LINES
- CS-1 =GAS MONITORING PROBE
- =CONDENSATE SUMP

REV.	DATE	BY	DESCRIPTION

PROPOSED LFGES MODIFICATIONS (PHASE I AND PHASE II)
LANDFILL GAS EXTRACTION SYSTEM MODIFICATIONS
CA INDUSTRIAL HOLDINGS, LLC
TRIANGLE LOGISTICS CENTER
COMMERCE CITY COLORADO

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FIGURE 6

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JOB NO.	25207313
ACAD NO.	005
SHEET NO.:	6 OF 7

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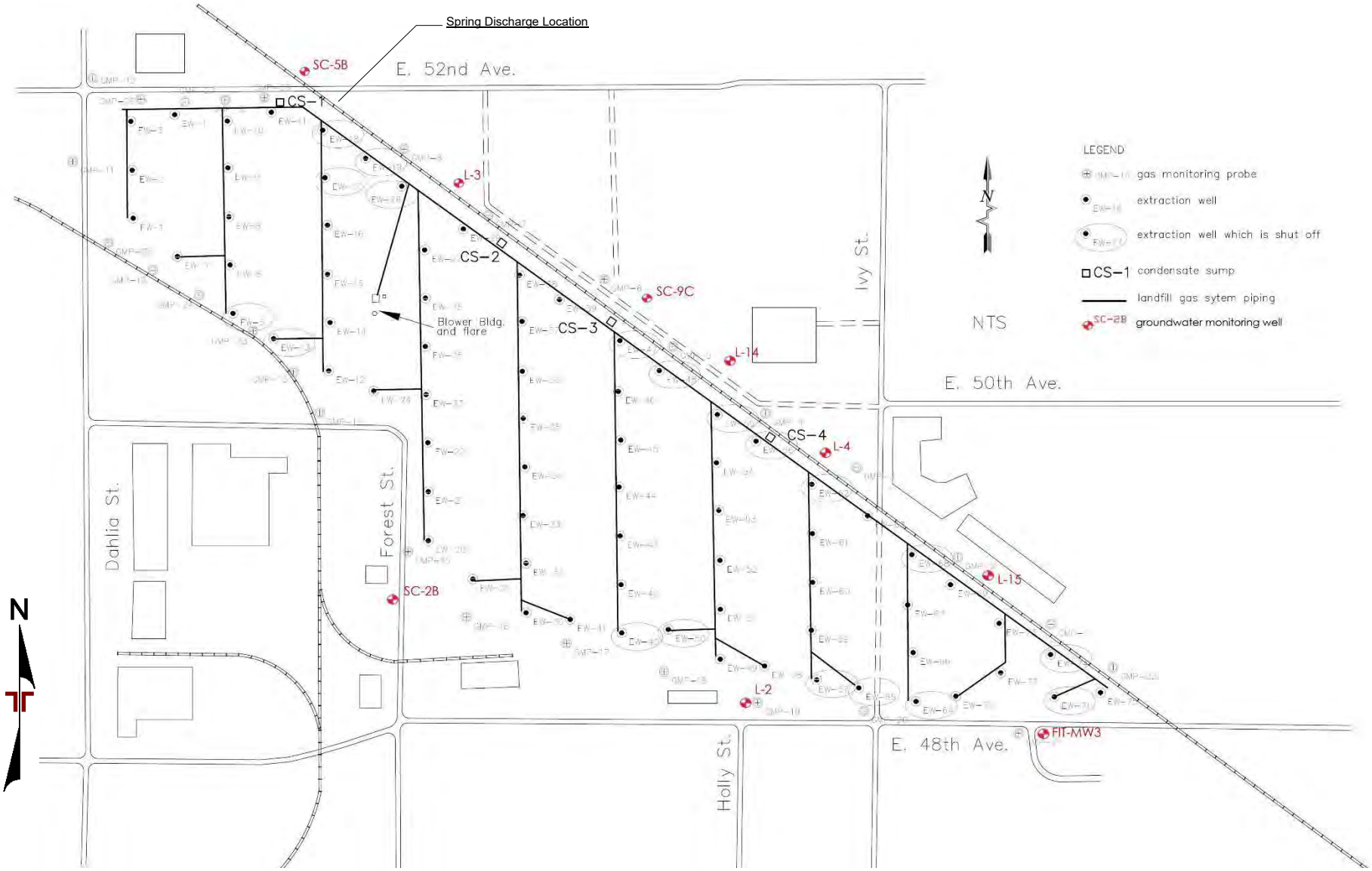

Map Source: Figure 1. Sixth Five-Year Review Report For Sand Creek Industrial Superfund Site City and County of Denver and Commerce City, Coloraod – Prepared by US EPA 09.28.2020

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

Project Manager: BMW	Project No. 25207313
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Approved by: MEW	Date: 9/9/2021

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

GROUNDWATER MONITORING WELL LOCATIONS

Landfill Gas Extraction System Modifications
CAI Industrial Holdings, LLC
Triangle Logistics Center
Commerce City Colorado

Figure .

APPENDIX A

48th and Holly Landfill (Operable Units 3 and 6)
Sand Creek Industrial Superfund Site - Record of Decision

RECORD OF DECISION
DECLARATION STATEMENT

SITE NAME AND LOCATION

48th and Holly Landfill (Operable Units 3 and 6), Sand Creek Industrial Superfund Site, Commerce City, Colorado

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for Operable Units 3 and 6 (OU3/OU6), the 48th and Holly Landfill (the "Landfill"), at the Sand Creek Industrial Superfund Site in Commerce City, Colorado. This remedial action has been developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), applicable state laws, and the National Oil and Hazardous Substances Pollution Contingency Plan (the National Contingency Plan (NCP), Title 40 Code of Federal Regulations Part 300). This decision is based on the administrative record for OU3/OU6.

The State of Colorado concurs with the selected remedy.

ASSESSMENT OF THE OU3/OU6

Actual or threatened releases of hazardous substances from the Landfill, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

The remedial action selected for OU3/OU6 will address the principal threats existing at the Landfill and will ensure that: (1) emissions of landfill gas are controlled to prevent inhalation at levels that pose an endangerment to human health or the environment, (2) accumulation of landfill gas is minimized in order to prevent explosion hazards, (3) dermal contact with the landfill contents is prevented, and (4) the use of ground water underlying the Landfill as a drinking water source is prevented.

The major components of the selected remedy include:

- Continued operation and maintenance of the OU6 landfill gas-extraction system (LFGES) with improvements as required during the normal course of operation and maintenance activities;

- Continued maintenance of the soil cover system with improvements as required during the normal course of operation and maintenance activities;
- Continued maintenance of the perimeter fence and warning signs;
- Continuation of existing institutional controls, and implementation of additional institutional controls, as necessary;
- Implementation of the OU3 monitoring program and periodic site reviews.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for OU3/OU6. Operation of the LFGES to extract and treat landfill gas addresses the principal threat at the Landfill and satisfies the statutory preference for treatment as a principal element. Condensate generated during operation of the LFGES will be treated by a POTW.

The size of the Landfill and the fact that there are no on-site hot spots that represent the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively. However, hazards associated with exposure to landfill contents will be minimized through containment, by maintaining the soil cover system. Groundwater contamination attributable to OU3 is not considered to be a principal threat, and potential exposure pathways for ground water have been addressed to the extent practicable.

Because this remedy will result in hazardous substances remaining on-site, a review will be conducted every five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Jack W. McGraw, Acting Regional Administrator
U.S. Environmental Protection Agency, Region VIII

6/30/03
Date

Thomas P. Looby, Director
Colorado Department of Health

Date

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES
(Continued)

48th AND HOLLY LANDFILL (OPERABLE UNITS 3 AND 6)
SAND CREEK INDUSTRIAL SUPERFUND SITE, COMMERCE CITY, COLORADO
RECORD OF DECISION

I. SITE NAME, LOCATION, AND DESCRIPTION

The Sand Creek Industrial Superfund Site (Figure 1) occupies about 300 acres within portions of both Commerce City in Adams County, Colorado and the City and County of Denver, Colorado. The site is centered near the intersection of 52nd Avenue and Dahlia Street. U.S. Interstate 270 is directly north of the site. Four known sources of contamination are present at the Sand Creek Industrial Superfund Site, and all are currently inactive: the Colorado Organic Chemical property, the 48th and Holly Landfill, the L.C. Corporation (LCC) property, and the Oriental Refinery property (a source of petroleum contamination). The 48th and Holly Landfill (Operable Units 3 and 6; OU3/OU6), hereafter referred to as "the Landfill," is the focus of this Record of Decision (ROD) and is located in the southern portion of the Sand Creek Industrial Superfund Site. The Landfill encompasses an area of approximately 150 acres and is bordered on the north by East 52nd Avenue, on the south by East 48th Avenue, on the west by Dahlia Street, and on the east by the intersection of the railroad right-of-way and East 48th Avenue, approximately one-quarter mile east of Ivy Street.

Land use near the Sand Creek Industrial Superfund Site is primarily industrial and includes trucking firms, petroleum refining operations, chemical production and supply companies, warehouses, and small businesses. Several other Superfund sites are also located in the area, including the Rocky Mountain Arsenal, Chemical Sales Company, and Woodbury. Properties adjacent to the site are zoned for light and heavy industrial, industrial park, industrial park storage and agricultural uses. Fifteen residences with approximately 25 people are located within a mile radius of the site. The daytime population reaches several hundred due to the local businesses and industrial nature of the area. The entire Denver parcel is zoned for heavy industrial use. No changes in zoning are anticipated by the City and County of Denver Planning Administration (CCDPA) in the near future. CCDPA indicates that long-range land-use plans will depend on the fate of Stapleton International Airport following completion of the new Denver International Airport.

The Commerce City parcel is zoned for agricultural and heavy industrial use. Commerce City's Comprehensive Plan for 1985 to 2010 indicates that future land use of this area will be primarily industrial with a recreation/open space designation for the Sand Creek floodplain.

Municipal water for the metropolitan area surrounding OU3/OU6 is supplied by the South Adams County Water and Sanitation District (SACWSD) and the Denver Water Department (DWD). Ground water produced from alluvial and bedrock wells

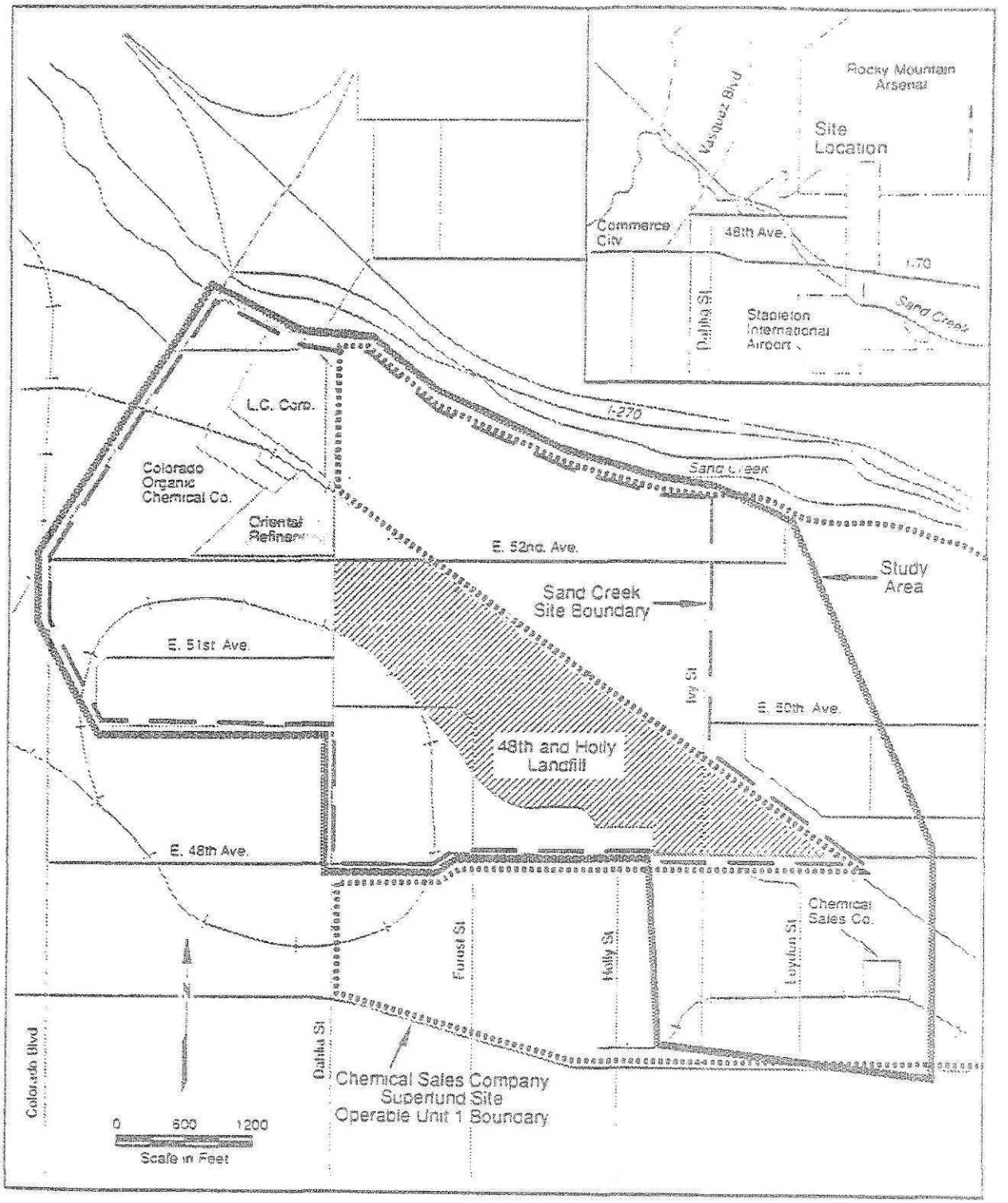

Figure 1. **Location of the 48th and Holly Landfill (OU3/OU6) at the Sand Creek Industrial Superfund Site, Commerce City, Colorado.**

located north of I-270 is a major source of water supplied by SACWSD. Water supplied by the DWD is obtained primarily from surface-water sources located outside of the Sand Creek Industrial Superfund Site area.

In 1990, the Tri-County Health Department (TCHD) prepared an inventory of private wells within the areas bounded on the north by Sand Creek, on the south by Interstate 70 (I-70), on the west by Colorado Boulevard, and on the east by Quebec Street. The Landfill is located within these boundaries and covers most of the western two-thirds of the survey area. The purpose of the inventory was to identify the locations and uses of all wells within the study area. Results indicated only two properties where private wells are used for drinking water and both wells were completed in the Arapahoe Formation (a bedrock aquifer).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Before filling operations began at the Landfill, the land was used primarily for agricultural purposes. A review of aerial photographs taken in 1956 and 1964 shows that sand and gravel mining operations occurred along the southern boundary of the Landfill. Aerial photographs also show that in 1967, a finger drain system, consisting of a series of clay tile lateral collector drains, was reportedly installed along the base of an erosional escarpment located along the south side of the Landfill near 48th Avenue. The reported purpose of the drain system was to intercept groundwater seepage from the terrace deposits forming the escarpment. The drain system routes water beneath the Landfill through a concrete drainpipe which empties via a corrugated metal drainpipe into a 1-acre wetland area adjacent to the Landfill.

Aerial photographs indicate that municipal landfilling operations began at the portion of the Landfill east of Ivy Street in 1967. In 1968, landfilling operations were initiated west of Ivy Street. According to the former Landfill operator, fill activities began at the south end of the Landfill and proceeded to the north in one layer or "lift." Daily cover material was graded from on-site areas, and the waste was watered to aid compaction.

The Landfill accepted both demolition and domestic refuse, and the trash was sorted before dumping. Metal refuse, such as stoves and refrigerators, was placed under the Colorado and Eastern Railroad Company right-of-way. Known hazardous and pathological wastes were reportedly excluded from disposal at the Landfill; however, the method used to exclude these wastes is not known. In addition, it is not known whether this reported operating practice was consistently employed. The Landfill was closed in 1975, and the area was revegetated.

In June 1977, two men were killed and five injured in two explosions of combustible gases that occurred in a water conduit under construction by the DWD

northwest of the intersection of 52nd Avenue and Dahlia Street. A subsequent investigation by the Colorado Department of Health (CDH), TCHD, and the South Adams County Fire Prevention Bureau (SACFPB) concluded that the explosions were caused by methane gas migrating from the Landfill. In response to the explosions and the detection of combustible gases migrating offsite, two methane gas venting systems were installed at the Landfill. Burlington Northern Railroad (BNR), in cooperation with TCHD and CDH, installed an experimental passive venting system utilizing wind turbines along the perimeter of the western 25-acre portion of the Landfill in 1978. In early 1980, an additional passive methane-gas venting system was installed in the eastern portion (east of Ivy Street) of the Landfill. Following the explosion, TCHD and SACFPB also periodically monitored for methane gas in businesses surrounding the Landfill. The detection of methane gas in nearby buildings, especially around cracks in foundations and basement walls, supported the conclusion that methane gas was migrating offsite of the Landfill. In 1981, TCHD determined that the passive venting system was ineffective, and as a result, BNR installed an active venting system along the southwest and northwest edge of the Landfill. Gases collected in this system were vented to the surface through three stacks.

In 1982, the U.S. EPA Field Investigation Team (FIT) performed an evaluation of the Sand Creek Industrial Site to see if it should be placed on the National Priorities List (NPL). A composite migration score (SM) of 59.65 was calculated for the site, and in December 1982 the Sand Creek Industrial site was added to the NPL. In its investigation, FIT conducted groundwater sampling downgradient of the Landfill as well as soil and surface water sampling in order to assess the degree of contamination in the area. Analytical results indicated the presence of several volatile organic compounds (VOCs) in ground water, including 1,1-dichloroethane (1,1-DCA); 1,2 trans-dichloroethene (1,2 trans-DCE); 1,1,1-trichloroethane (1,1,1-TCA); and 1,1-dichloroethene (1,1-DCE). Inorganic compounds that were detected at concentrations elevated above background levels included arsenic, cadmium, nickel, and zinc.

In late 1983, BNR installed 12 monitoring wells within and around the Landfill and collected groundwater and surface-water samples for analysis. Concentrations of arsenic, selenium, lead, antimony, and phenols exceeded EPA drinking water standards or clean water standards in the area. In January 1984, EPA resampled these locations in the northern portion of the Landfill. Elevated levels of volatile organics (benzene; chloroform; 1,2-DCA; 1,1-DCE; 1,2 trans-DCE; tetrachloroethene (PCE); and 1,1,1-TCA), heavy metals (cadmium, iron, and manganese), and one phthalate ester were noted in ground water.

In April 1985, Camp Dresser & McKee, Inc. (CDM) began preparation of a Remedial Investigation/Feasibility Study (RI/FS) for the Sand Creek Industrial Superfund Site. The site characterization report was completed in 1988. During that time, BNR continued to investigate possible groundwater contamination in the vicinity of the Landfill. Four newly installed wells and three existing wells were sampled and

indicated the presence of slightly elevated concentrations of total dissolved solids (TDS) and iron, and low concentrations of 1,1-DCE and 1,1-DCA downgradient of the Landfill.

In August 1987, Engineering-Science, Inc. (ES) collected and analyzed one air sample from each of the three active methane gas venting stacks to determine whether emissions could cause adverse health effects. In addition, ES collected four surficial soil samples to assess emissions resulting from the upward diffusion of gas through the Landfill cover. Collectively, sixteen VOCs were detected in the stack vent gas samples. No indication of contamination was observed in the soil samples from the landfill cover.

On February 8, 1990 EPA issued an Administrative Order on Consent (AOC; Docket No. CERCLA-VIII-90-08) to Landfill, Inc. (LI) and BNR to perform an RI/FS for the 48th and Holly Landfill (OU3). EPA's Statement of Work (SOW) in the OU3 AOC included the existing Landfill, the spring emerging from the toe of the Landfill, and the associated surface-water drainage to the point where the drainage enters a concrete-lined ditch. Harding Lawson Associates, Inc. (HLA) on behalf of LI and BNR, completed the draft revised Risk Assessment (RA) in April 1992 and the final OU3 RI in June 1992. In response to EPA comments and current Superfund guidance, the OU3 RA was revised and finalized in early 1993. The Focused Feasibility Study (FFS) for OU3 was completed and submitted to EPA in March 1993.

On August 15, 1990 EPA issued a Unilateral Order (Docket No. CERCLA-VIII-90-20) to LI and BNR which delineated the PRPs' role in the OU6 Removal Action. The OU6 Order addressed explosive and health risks associated with gaseous emissions released from the Landfill and became effective on August 25, 1990. An amendment issued in September 1990 to the OU3 AOC provided for the inclusion of gaseous emissions from the Landfill (i.e., OU6) under OU3 following the full implementation of the OU6 Removal Action.

In November 1990, an Engineering Evaluation/Cost Analysis (EE/CA) was prepared for OU6 at the Landfill. The report described the site conditions which justified a Removal Action, identified Removal Action objectives, discussed remedial alternatives, and presented the chosen remedy. EPA prepared an Action Memorandum to request and document approval of the PRP-financed Removal Action for OU6 in December 1990. An active landfill gas-extraction system (LFGES) was installed by LI and BNR, which began operation in June 1991 as part of the OU6 Removal Action. The LFGES replaced the previously installed systems and consists of a series of gas extraction wells interconnected by gas collection piping. Two centrifugal blowers connected to a single point in the gas collection system are operated alternately to induce the flow of gases from the gas extraction wells. The gas is diverted to an enclosed flare system for treatment. The enclosed flare system is designed to destroy odors and toxic components of the landfill gas. Gas monitoring probes are also installed around the perimeter of the Landfill to monitor the LFGES performance. The probes are monitored at least monthly for methane concentrations and gas pressure.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

The community has expressed limited interest in OU3 and OU6, specifically, and the Sand Creek Industrial Superfund Site, in general. EPA has undertaken several community relations activities to keep the public informed of issues related to the Landfill.

Community involvement activities for the Sand Creek Industrial Superfund Site began in April 1985. EPA distributed an introductory fact sheet to area residents, businesses, and agencies. The fact sheet provided background information about the site and an explanation of the Superfund process. EPA also attended a public meeting organized by the Citizens Against Contamination, a local group from the area, and compiled a list of property owners for the entire site.

EPA mailed a second fact sheet for the Sand Creek Industrial Superfund Site in November 1985. This fact sheet provided additional information on investigation and clean-up activities associated with hazardous waste sites. During the same month, EPA provided a groundwater contamination briefing at a second public meeting held by the Citizens Against Contamination.

In January 1986, EPA contacted property owners and Commerce City officials to inform them of activities at the Sand Creek Industrial Superfund Site. In April 1987, EPA surveyed area residents about their water-use habits to determine future outreach efforts.

An RI report describing the nature and extent of contamination at the Sand Creek Industrial Superfund Site was released for public review in March 1988. In May 1988, EPA contacted owners for permission to sample soils on their property. In October 1988, EPA met with Commerce City officials to brief them and solicit their reaction to clean-up plans for the site.

On three occasions in 1990, EPA held public meetings addressing all of the Superfund sites in South Adams County, excluding the Rocky Mountain Arsenal. At each meeting, EPA presented its intentions for the Removal Action at OU6 and encouraged public participation. A public comment period was held from October 9, 1990 to November 9, 1990 for the OU6 EE/CA, and no comments were received by EPA.

In the fall of 1991, community interviews were conducted to update the site Community Relations Plan (CRP) originally issued in December 1984. The CRP outlines community concerns, EPA's strategy for implementing the plan, and establishes information repositories. A list of contacts and interested parties throughout government and the local community are also provided. The CRP was released in December of 1991. In addition to meeting directly with the public, EPA and the CDH have met with

the Tri-County Health Department staff, South Adams County Water and Sanitation District, Rocky Mountain Arsenal personnel, Commerce City/Adams County officials, Metro Waste Water officials, and Representative Patricia Schroeder's staff to update them on OU3/OU6 activities.

On June 3, 1992 a public meeting was held to discuss the Risk Assessment prepared for OU3. EPA issued the Proposed Plan for OU3/OU6 to the public on March 19, 1993. The Proposed Plan as well as the RI, RA, and FFS reports were made available to the public through the Administrative Record maintained at the EPA Region VIII Superfund Records Center in Denver and at the information repository at the Adams County Library. A notice of availability of these documents and notification of the public meeting were published in *The Rocky Mountain News* on March 28, 1993 and in the *Commerce City Express* on March 30, 1993.

The public comment period for the OU3/OU6 Proposed Plan was open from March 22, 1993 to April 21, 1993. The public meeting was held at 5:30 p.m. on March 30, 1993 at the Commerce City Recreation Center. EPA explained the alternatives and responded to questions. A transcript of the public meeting has been entered into the Administrative Record. No written or oral comments were received.

IV. SCOPE AND ROLE OF RESPONSE ACTION

Due to the complex nature of the Sand Creek Industrial Superfund Site, EPA has divided it into six OUs, or study areas, in order to more effectively address specific contamination problems. The OUs were established based on the types of contaminants present, the type of media affected, and physical characteristics. As discussed above, two OUs (3 and 6) pertain specifically to the 48th and Holly Landfill. The six operable units at the Sand Creek Industrial Superfund Site are as follows:

- Operable Unit 1: OU1 addresses contaminated buildings, soil contamination greater than 1000 parts per million (ppm), and VOCs in the soils. The OU1 area includes approximately 15 acres of the site, including the Colorado Organic Chemical plant property, the land between Colorado Organic Chemical and the L.C. Corporation, and the northern portion of the Oriental Refinery site.

- Operable Unit 2: This OU addresses the acid waste disposal pits, just north of the Colorado Organic Chemical property, commonly referred to as the L.C. Corporation. It is reported that pits located there were used for disposal of acid waste from various chemical manufacturing activities occurring both off and on site.

- Operable Unit 3: This study area comprises the 48th and Holly Landfill and specifically includes contaminated surface water, ground water, sediment, soil, and air in its vicinity.

- Operable Unit 4: This study area comprises the entire site-wide contaminated ground water.

- Operable Unit 5: OU5 includes the same area as OU1, but addresses pesticides and heavy metals in soils to a depth of 5 feet with contamination greater than action levels and less than or equal to 1000 ppm. There are up to approximately 14,000 cubic yards of contaminated soil in OU5.

- Operable Unit 6: This OU addresses the gaseous emissions at the 48th and Holly Landfill.

At the present time, RODs have been prepared to address remediation action for OU1, OU2, and OU5 at the Sand Creek Industrial Superfund Site. A ROD amendment is currently being developed to address fundamental changes made to the selected remedy for OU5, and the RI/FS for OU4 will be completed in the summer of 1993.

This ROD addresses the principal potential threats to humans and the environment resulting from exposure to the 48th and Holly Landfill (OU3/OU6). As noted above, an amendment (September 1990) to the OU3 Administrative Order for the RI/FS allowed for the inclusion of gaseous emissions from the Landfill in OU3 after the OU6 Removal Action had been fully implemented. The OU3 FFS evaluated three alternatives for reducing exposure to contaminated surface water and landfill gas. Ground water, sediment, and soil were assessed, but remedial alternatives were not considered as a result of evaluation of media of concern and potential exposure pathways addressed under OU3. Specific objectives of the remedial action selected for OU3/OU6 are as follows. Landfill and off-site workers as well as off-site residents will be protected from the landfill contents and gas by ensuring that: (1) emissions of landfill gas are controlled to prevent inhalation at levels that pose an endangerment to human health or the environment, (2) accumulation of landfill gas is minimized in order to prevent explosion hazards, (3) dermal contact with the landfill contents is prevented, and (4) the use of ground water underlying the Landfill as a drinking water source is prevented.

A groundwater monitoring program will be implemented at the site to assess changing aquifer conditions and to continue evaluating the Landfill's impact on groundwater quality. The groundwater monitoring data will provide information for conducting periodic site reviews. In the future, such as when the remedial action for the Chemical Sales site is complete, if it is determined from subsequent evaluations that the Landfill is responsible for unacceptable groundwater contamination, remediation of the ground water at the Landfill will be addressed under OU3.

V. SUMMARY OF SITE CHARACTERISTICS

The Sand Creek Industrial Superfund Site, including the 48th and Holly Landfill, is located in an urban environment that has been extensively modified by industrial development over the past 50 years. The site lies in an area of low relief within the Sand Creek flood plain, which is part of the South Platte River system. The on-site drainage represents less than one-half of one percent of the total drainage to Sand Creek. The only surface-water feature within the Landfill study area is a 1-acre wetland located immediately north of the Landfill. The wetland receives water from a "spring" that discharges from a corrugated metal pipe. This pipe is connected to finger drains that were installed before landfilling operations began to divert seeps originating along the escarpment to the south.

The Landfill is in an area classified as mid-latitude semiarid, indicating an area of high summer temperatures, cold winters, and sparse rainfall. The average annual precipitation is approximately 15 inches.

A. Surface Geology

Topography in the area rises gently to the south, with elevations ranging from approximately 5,180 feet above mean sea level (MSL) in the northwestern corner of the site to approximately 5,250 feet MSL in the southeastern corner. Interpretation of natural features is complicated by the extensive amount of fill that has been brought into the area. Between 2 and 10 feet of soil capping material currently covers the refuse at the Landfill. Natural drainage paths also have been altered by development in much of the area. Natural surficial deposits consist of Pleistocene and Holocene alluvium, eolian sediments, and loess. Alluvial deposits in the vicinity of OU3/OU6 range in thickness from less than 20 feet to more than 100 feet. The deposits generally consist of interbedded gravel, sand, silt, clay, and minor amounts of cobbles and pebbles. In addition, paleochannels eroded in the bedrock may influence the occurrence and movement of ground water in the area.

B. Subsurface Geology

The subsurface geology in the vicinity of the Landfill consists of Quaternary alluvial deposits and Tertiary bedrock. Alluvial deposits consist of sand, silt, and clay of the Piney Creek alluvium, eolian deposits of silt and clay, and sand and gravel of the Broadway alluvium. Clay and gravel sediments of the Slocum alluvium are also locally present. Bedrock in the area is made up of claystone, shale, siltstone, and sandstone of the Denver formation. The Denver formation is underlain by the Arapahoe formation, Laramie formation, and Fox Hills sandstone. Outcrops of bedrock are not visible at the Landfill.

C. Hydrogeology

Three discrete aquifers (Aquifers 0, 1, and 2) have been identified within the unconsolidated sediment overlying bedrock in the vicinity of the Landfill. Bore hole logs taken from investigations in the vicinity of the Landfill show that alluvial deposits are composed of relatively high permeability sands and gravels interbedded with low permeability clayey and silty material.

In the southeastern portion of the Landfill, Aquifer 0 is the only alluvial aquifer present, and it directly overlies bedrock or fine-grained alluvial sediments overlying bedrock. In the central part of the Landfill, Aquifer 0 exists under perched conditions above Aquifer 2. Aquifer 0 is unconfined throughout the Landfill and is underlain by a low permeability clayey layer (Aquitard A), which inhibits downward movement of ground water. Within Aquifer 0, groundwater flow is generally toward the north to northwest.

Aquifer 0 receives recharge from upgradient of the Landfill and discharges to Aquifer 2 where the confining unit separating these aquifers pinches out in the northwest portion of the Landfill. Aquifer 0 also discharges to the spring located north of the Landfill via the finger drain system. The direction of groundwater flow in Aquifers 0 and 2 is generally consistent with the regional flow direction of the alluvial system.

Aquifer 1 is present northwest of the Landfill, including the extreme northwestern portion of the Landfill. Aquifer 1 exists under unconfined conditions and is separated from Aquifer 2 by a clayey impermeable unit (Aquitard B). Groundwater flow within Aquifer 1 is generally toward the east. Ground water may discharge from Aquifer 1 to Aquifer 2 in the area where the confining unit separating these aquifers pinches out, in the vicinity of the northern boundary of the Landfill.

The third alluvial aquifer (Aquifer 2) is present over the western two-thirds of the Landfill. Aquifer 2 underlies Aquifer 0 and Aquifer 1 in areas where present and overlies fine-grained alluvial sediments overlying bedrock. Aquifer 2 exists under confined conditions to the west and northwest of the Landfill but is unconfined beneath the Landfill and south of the site. Groundwater flow within Aquifer 2 is generally toward the north.

D. Nature and Extent of Contamination

A site-wide RI completed in 1988 identified several contaminants in various operable units. The sources and extent of contamination were not well established because of the limited number of samples taken. Therefore, additional samples were collected during the OU3 RI to verify or better define contamination associated with the

Landfill. The following media were assessed for the presence of contamination in the vicinity of the Landfill:

- Surficial soil
- Ground water
- Surface water and sediment
- Air/landfill gas

Surficial soil samples collected during previous investigations within OU3 and during the OU3 investigation of sediment within the spring discharge area indicated that contaminants are not present in these two media. Therefore, the Landfill is not considered a contributor of contaminants to surficial soil and sediment.

Several VOCs, including 1,1,1-TCA; 1,1-DCA; 1,1-DCE; 1,2-DCE (total); chloroform; PCE; and TCE were detected in surface-water samples collected from the spring discharge area. The VOCs detected in surface water are essentially the same as those detected upgradient of the Landfill in the Chemical Sales site contaminant plumes in Aquifer 0. Due to the similarity of compounds detected upgradient and downgradient of the Landfill, and the origin of the water discharged to the spring, the OU3 RI concluded that the most likely source of surface-water contamination is the contaminated groundwater plumes in Aquifer 0 that resulted from past releases from the Chemical Sales site.

Groundwater samples collected from Aquifers 0, 1, and 2 and water samples collected from the landfill gas-extraction wells had detectable levels of a number organic and inorganic constituents. VOCs were the most widespread of the organic constituents detected in groundwater samples and were detected at the highest concentrations. Semi-volatile organic compounds (SVOCs) were also detected in these samples. The distribution and range of concentrations for the SVOCs were significantly lower than those observed for the VOCs.

Major sources of groundwater contamination exist in the vicinity of OU3. These sources include the Chemical Sales site, located southeast of the Landfill, and the Colorado Organic Chemical Company and Oriental Refinery sites, located west of the Landfill. Substantial plumes of VOCs within Aquifer 0, including PCE; TCE; 1,1-DCE; 1,1-DCA; cis-1,2-dichloroethene (cis-1,2-DCE); 1,1,1-TCA; vinyl chloride; methylene chloride; and carbon tetrachloride emanate from the Chemical Sales site and extend to the north at least as far as Sand Creek. Concentrations of several VOCs within these plumes exceed 10,000 micrograms per liter (μg/l) near the source area. These contaminated groundwater plumes from the Chemical Sales site pass beneath the eastern portion of the Landfill and may affect groundwater quality downgradient of OU3/OU6.

Major plumes of hydrocarbon compounds, including benzene, toluene, ethylbenzene, xylenes, chlorinated VOCs, and SVOCs are present within Aquifer 1.

These plumes emanate from the Colorado Organic Chemical Company and/or Oriental Refinery sites (OU1 and OU5) and extend northeast to Sand Creek. The contaminant plumes may pass beneath the extreme northwestern portion of the Landfill and affect groundwater quality downgradient of OU3/OU6.

Pesticides and herbicides were generally not detected in ground water in the vicinity of the Landfill. The inorganic constituents detected in groundwater samples were generally consistent upgradient and downgradient of the Landfill. However, a limited number of inorganic constituents appeared to be slightly elevated in downgradient monitoring wells relative to the range of concentrations observed in upgradient wells. The inorganic constituents detected most frequently at significantly elevated concentrations include iron and manganese. A few additional inorganics including antimony, barium, cadmium, calcium, cobalt, magnesium, nickel, potassium, sodium, and chloride, were detected downgradient of the Landfill at slightly elevated levels.

Water samples were collected from selected landfill gas-extraction wells during construction of the LFGES to assess the presence of contaminants within the Landfill. The most frequently detected organic constituents include ketones, benzene, ethylbenzene, toluene, total xylenes, and several chlorinated VOCs. The ketones were detected in the highest concentrations, ranging as high as 5600 μg/l for 2-butanone. Chlorinated VOCs were detected less frequently and at generally lower concentrations. The compounds detected most frequently in samples from landfill gas-extraction wells were generally not detected in monitoring wells located downgradient of the Landfill. Inorganic constituents were detected in samples from landfill gas-extraction wells at concentrations significantly exceeding background concentrations in Aquifer 0.

As discussed in the OU3 RI, the chemical data for the various media indicate that the Landfill is not contributing significantly to organic and inorganic contamination downgradient of the Landfill. Other source areas in the vicinity of the Landfill are clearly contributing substantial levels of organic constituents to ground water, both upgradient and downgradient of the Landfill. The Chemical Sales site appears to be the source for most of the chlorinated VOCs that are detected in the ground water.

The inorganic analytical data indicate that iron and manganese may originate in the Landfill. These constituents are elevated in the landfill gas-extraction well water samples and are also observed at elevated levels downgradient of the Landfill.

Air samples were collected from stack vents associated with landfill gas-collection systems formerly operating at the Landfill. Analytical results for these samples showed the presence of several VOCs, including benzene; chloroform; 1,1-DCE; PCE; and vinyl chloride. Most concentrations were less than 10 mg/m^3. In addition, the methane gas explosions that occurred near the Landfill in 1977 indicated that landfill gas is capable of migrating from the Landfill. The LFGES installed at the Landfill in 1991 as part of the

OU6 Removal Action is designed to prevent the migration of landfill gas from the Landfill.

E. Water Diversions

The rights for surface-water diversion from Sand Creek exist at two separate locations downstream of the Landfill. The first diversion point is the proposed Henrylyn Sand Creek Diversion, which is approximately 1.5 miles downstream of the Sand Creek Industrial Superfund Site on the northeast quarter of Section 12, Township 3 South, Range 68 West (T3S, R68W). Diversions from this location could reach 250 cubic feet per second of water for direct irrigation and storage in existing and planned reservoirs. The second diversion point is approximately 2 miles downstream of the Sand Creek Industrial Superfund Site where the Burlington Ditch intersects Sand Creek. A maximum of 250 cubic feet per second of water is appropriated for irrigation and domestic use at this location. According to a representative of the Burlington Ditch Company, water rights along the proposed Henrylyn Sand Creek Diversion or the existing Burlington Ditch have not been exercised to date.

VI. SUMMARY OF OU3/OU6 SITE RISKS

CERCLA mandates that EPA protect human health and the environment from current and potential exposures to hazardous substances at the 48th and Holly Landfill. Therefore, a Risk Assessment (RA) was prepared for OU3 to evaluate potential human health and environmental baseline risks associated with contamination at the site in the absence of any remedial action. The OU3 RA supplements and updates a previous RA prepared in 1987 for the Landfill by incorporating data collected during the OU3 RI. The OU3 RA also addresses risks posed by baseline conditions present at OU6 prior to implementation of the Removal Action. Two primary types of hazards are associated with the Landfill: the potential health hazard posed by contamination related to the Landfill, and the potential explosive hazard associated with methane gas generated within the Landfill.

A. Contaminants of Concern

Ground water in Aquifers 0, 1, and 2, surface water, and air were identified as media of concern in the OU3 RI. Soil and sediment were eliminated since investigations indicated that they were not significantly contaminated. Analytical data collected from 1986 through 1991 for the media of concern were evaluated according to EPA data validation criteria, a concentration toxicity screen was performed, and the fate and transport properties of individual chemicals were examined in developing a list of chemicals of concern (COC) for the Landfill. The 23 COCs selected include VOCs,

SVOCs, and metals. These contaminants represent all the carcinogenic chemicals detected in media of concern and the non-carcinogenic chemicals present that are the most likely to pose the greatest relative risk to humans and the environment. Chemicals detected in stack vent air samples and used as indicator chemicals in the previous RA are also considered as COCs for the air medium. A list of COCs for specific media of concern is presented in Table 1.

B. Exposure Assessment

Exposure pathways and receptors were identified based on the OU3 site conceptual model. Potential release mechanisms associated with the Landfill include leaching of chemicals in refuse and their subsequent movement into ground water, and volatilization of landfill gas. Although an active LFGES is currently operating at the Landfill, baseline conditions that were present before remedial measures were implemented were considered in assessing risk associated with the Landfill. Transport processes at the Landfill include groundwater flow and withdrawal, groundwater discharge to surface water, and dispersion of VOCs from the Landfill.

Exposure pathways that were quantitatively evaluated for the current land-use scenario in the OU3 RA are: inhalation of ambient air for local residents, nearby workers, nearby neighborhoods, and the nearest school; and dermal exposure to surface water for children potentially wading in the spring discharge area. Environmental receptors (i.e., plants and wildlife) potentially exposed to COCs in surface water were also qualitatively assessed. Under the current land-use scenario, no human receptors are known to be exposed to chemicals at the Landfill via the domestic use of ground water. The ground water beneath the Landfill is classified by the State of Colorado as a potential drinking water supply, and the South Adams County Water and Sanitation District (SACWSD) draws municipal supplies from the area north of the Landfill. There is currently a limited use of ground water for crop irrigation and livestock watering in the area. The SACWSD, irrigation, and livestock watering pathways will be assessed as part of the entire Sand Creek Industrial Superfund Site under OU4.

Exposure pathways that were quantitatively evaluated for local residents under the potential future land-use scenario are: ingestion of groundwater contaminants in drinking water, inhalation of VOCs from ground water while showering, dermal exposure to irrigation water derived from ground water, dermal exposure to surface water for children potentially wading in the spring discharge area, and inhalation of ambient air from vapors emanating from the Landfill. Risks associated with aquatic life coming into direct contact with surface water were also quantitatively assessed for the hypothetical future scenario.

Estimated current and potential future risks were based on an average or most likely exposure concentration (MLE) and a reasonable maximum exposure concentration

Table 1. Chemicals and Media of Concern for the 48th and Holly Landfill (OU3 and OU6), Sand Creek Industrial Superfund Site.

CHEMICALS OF CONCERN	SURFACE WATER	GROUND WATER	AIR
VOLATILE ORGANICS:			
Benzene	X	X	X
Chloroform	X	X	X
1,2-Dichloroethane (1,2-DCA)	X	X	
1,1-Dichloroethene (1,1-DCE)	X	X	X
1,2-Dichloroethene (1,2-DCE)	X	X	
1,2-Dichloropropane	X	X	
Tetrachloroethene (PCE)	X	X	X
1,1,1-Trichloroethane (1,1,1-TCA)	X	X	
Trichloroethene (TCE)	X	X	
1,1,2-Trichloroethane (1,1,2-TCA)	X	X	
Vinyl Chloride	X	X	X
SEMIVOLATILE ORGANICS:			
Naphthalene	X	X	
INORGANICS:			
Antimony	X	X	
Arsenic	X	X	
Barium	X	X	
Cadmium	X	X	
Fluoride	X	X	
Manganese	X	X	
Mercury	X	X	
Nickel	X	X	
Vanadium	X	X	
ADDITIONAL VOLATILE ORGANICS FOR AIR			
Chlorobenzene			X
Toluene			X

(RME) using concentrations of COCs in ground water and surface water. Because of limited numbers of groundwater samples for each well location and the need to compute exposure point concentrations for each individual well, RME concentration values were established as the maximum detection on a per well basis. The MLE concentrations were computed as the arithmetic mean of the data collected for each well. For air, maximum concentrations modeled for the previous RA were used as exposure point concentrations, since the OU3 RA does not consider operation of the OU6 LFGES. The exposure point concentrations for COCs in ground water, surface water, and air are presented in Table 2.

Intakes of COCs for each of the exposure scenarios were calculated separately by exposure route and then summed. The exposure assessment was structured to address potentially sensitive subpopulations, including children. Exposure assumptions used to estimate risk associated with MLE and RME exposure scenarios are presented in Table 3.

C. Risk Characterization

Potential health risks to humans are expressed in two ways: carcinogenic (cancer causing) and non-carcinogenic. For carcinogens, it is assumed that there is no safe dose, but that the risk of cancer lessens as the dose decreases. Cancer potency factors (CPFs) or slope factors are used for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. Excess lifetime cancer risk is determined by multiplying the intake level by the CPF. These risks are probabilities and are generally expressed as excess cancer risks. An excess lifetime cancer risk indicates the chance, over and above the background average risk (approximately one in four), that an individual has of developing cancer as a result of exposure to a carcinogen over a 70-year lifetime under specific exposure conditions. In determining the need for remedial action at Superfund sites, EPA guidance states that the total excess cancer risk for all contaminants must fall below the range of one chance in ten thousand (1.0E-04) to one chance in one million (1.0E-06).

Non-carcinogenic risks are calculated by assuming that there is a dose below which no adverse health effects will occur. This dose is referred to as the reference dose (RfD) and is used to estimate the hazard quotient (HQ) associated with the potential exposure to non-carcinogens. HQs are determined by calculating the ratio of the estimated intake level to the RfD. A hazard index (HI) can be generated by adding the HQs for all chemicals having similar target organs or critical effects within a medium, or by adding HQs across all the media to which a population may reasonably be exposed. The HI provides a useful reference point for evaluating the potential significance of multiple contaminant exposures within a single medium or across media. An HI of 1 is identified in the NCP as a Superfund site remediation goal.

Table 2. Chemicals of Concern and Exposure Point Concentrations

CHEMICALS OF CONCERN	SURFACE WATER (µg/L)		AIR (mg/m³)				GROUND WATER (µg/L)[a]	
	MLE[a]	RME[b]	@10 feet[c]	@600 feet[c]	@0.75 miles[c]	@1.25 miles[c]	MLE max[c]	RME max[d]
VOLATILE ORGANICS:								
Benzene	0.3	0.5	4.00E-5	6.30E-05	5.60E-05	1.32E-04	303	540
Chloroform	0.8	1.0	2.57E-04	1.61E-04	8.40E-05	5.60E-05	37.0	37.0
1,2 Dichloroethane (1,2-DCA)	0.5	0.5	---	---	---	---	11.5	25.0
1,1-Dichloroethene (1,1-DCE)	13.7	15.0	0.00E-06	0.00E-06	4.10E-05	2.74E-04	1500	1500
1,2 Dichloroethene (1,2-DCE)	46.3	53.0	---	---	---	---	443	920
1,2 Dichloropropane	0.5	0.5	---	---	---	---	10.5	25.0
Tetrachloroethene (PCE)	21.0	23.0	1.23E-04	2.37E-04	1.93E-04	4.02E-04	3700	5500
1,1,1-Trichloroethane (1,1,1-TCA)	13.7	15.0	---	---	---	---	3177	7200
Trichloroethene (TCE)	10.0	11.0	---	---	---	---	1350	2400
1,1,2-Trichloroethane (1,1,2-TCA)	0.5	0.5	---	---	---	---	10.5	25.0
Vinyl Chloride	1.0	1.0	6.00E-06	4.20E-05	2.70E-05	8.00E-06	30.0	50.0
SEMIVOLATILE ORGANICS:								
Naphthalene	5.0	5.0	---	---	---	---	130	140
INORGANICS:								
Antimony	12.0	12.0	---	---	---	---	57.9	87.1
Arsenic	1.5	1.9	---	---	---	---	43.3	81.7
Barium	48.9	48.9	---	---	---	---	1090	1090
Cadmium	1.5	1.5	---	---	---	---	9.1	13.1
Fluoride	1900.0	1900.0	---	---	---	---	14,000	14,000
Manganese	68.4	72.4	---	---	---	---	12,560	24,520

Table 2. Chemicals of Concern and Exposure Point Concentrations (Continued)

Mercury	0.9	1.1	---	---	---	---	0.7	1.7
Nickel	6.0	6.0	--	---	---	---	1918	3830
Vanadium	5.1	5.1	---	---	---	---	28.0	26.0
ADDITIONAL VOLATILE ORGANICS FOR AIR								
Chlorobenzene	---	---	0.00E-06	3.00E-06	5.00E-06	2.70E-05	---	---
Toluene	---	---	1.86E-04	3.48E-04	2.24E-04	1.79E-04	---	---

[a] MLE = Most likely exposure concentration
[b] RME = Reasonable maximum exposure concentration
[c] Ambient air exposure point concentrations were modeled (ES, 1987). Values shown are maximum concentrations estimated for receptors at the indicated distance from the source.
Distance/Receptor: 10 feet = trespassers; 600 feet = local residents or nearby workers; 0.75 mile = nearest developed neighborhood; 1.25 miles = nearest school.
[d] Groundwater concentrations are from 31 wells within, upgradient, and downgradient of the landfill. Wells included may be affected by chemicals from other sources.
[e] MLE concentrations were calculated for individual wells. The value shown is the highest groundwater MLE concentration reported.
[f] RME concentrations were calculated for individual wells. The value shown is the highest groundwater RME concentration reported.

Source: OUS RA (IHA, 1993)

Table 3. Exposure Assumptions Used to Estimate Risks for MLE and RME Scenarios

PARAMETER	UNITS	MLE	RME
Averaging Time	days	25,550 (carcinogens/adult) 3,285 (noncarcinogens/adult) 3,285 (noncarcinogens/child)	25,550 (carcinogens/adult) 10,950 (noncarcinogens/adult) 3,285 (noncarcinogens/child)
Body Weight	kg	70 (adult) 18 (child)	70 (adult) 18 (child)
Dermal Surface Area (surface water)	cm^2/event	3,000 (adult) 1,500 (child)	3,000 (adult) 1,500 (child)
Exposure Frequency (non-surface water)	days/year	350 (adult) 350 (child)	350 (adult) 350 (child)
Exposure Frequency (surface water)	events/year	7 (adult) 7 (child)	62 (adult) 62 (child)
Exposure Duration	years	9 (adult) 9 (child)	30 (adult) 9 (child)
Exposure Time (surface water)	hours/day	2.0 (adult) 2.0 (child)	2.6 (adult) 2.6 (child)
Ingestion Rate (water)	l/day	1.4 (adult) 0.7 (child)	2.0 (adult) 1.0 (child)
Inhalation Rate (air)	m^3/day	20 (adult) 5 (child)	20 (adult) 5 (child)

Source: OU3 RA (HLA, 1993).

The RME and MLE cancer and non-cancer risk estimates by exposure pathways for current and potential future land-use scenarios at the study area are presented in Table 4.

1. Current Human Health Risks

Under the assumption that the LFGES is no longer functioning and nearby residents are exposed to maximum concentrations of chemicals in air, the inhalation of ambient air is the greatest contributor to carcinogenic risk for the current land-use scenario. Total mean RME and MLE cancer risk estimates for dermal exposure to surface water and inhalation of vapors from ambient air are both approximately 4.0E-05. This total RME and MLE cancer risk for the current scenario does not exceed the highest acceptable risk of 1.0E-04 but exceeds the point of departure for assessing the need for remedial action of 1.0E-06, as defined by the NCP. For the current land-use scenario the total HI is less than 1 and indicates there are no unacceptable potential adverse non-carcinogenic health effects.

Though ground water in the area is classified as a potential drinking water supply by the State of Colorado, there is no unacceptable current health-risk due to ingestion, inhalation, or skin contact with contaminated ground water since water for residential use is provided through treated water from either the Denver Water Department or SACWSD. The operation of the LFGES currently eliminates emissions from the Landfill. However, if the LFGES was not operating, the estimated cancer risk for inhalation of landfill gas vapors would be approximately four people in 100,000.

2. Future Human Health Risks

As part of the human health risk assessment for the potential future land-use scenario, the domestic use of ground water was evaluated. Individual cancer risks and hazard indices were calculated for 31 well locations within the study area for the hypothetical future groundwater-use scenario. Estimated risk levels for this scenario indicate that RME cancer risk exceeds 1.0E-04 near the southeast and northwest portions of the Landfill, and that 1,1-DCE, vinyl chloride, and arsenic are the primary contributors to the total carcinogenic risk in these areas. These values represent risks posed to humans using alluvial ground water for domestic purposes. The total site-wide RME cancer risk of 3.0E-03 for the potential future land-use scenario is greater than the target risk range of 1.0E-06 to 1.0E-04. Similarly, the total MLE cancer risks for the potential future land-use scenario of 4.0E-04 also exceeds the target risk range. The pathway contributing the most to the overall cancer risk for the potential future-use scenario is the domestic use of ground water. Cancer risk associated with inhalation of gas vapors in the future could be as high as 2.0E-06 risk for children and 9.0E-07 risk for adults assuming continuous exposure to maximum chemical concentrations.

Table 4. Total Cancer and Non-Cancer Risk Estimates by Exposure Pathway for Current and Potential Future Scenarios.

EXPOSURE PATHWAY	CANCER RISKS		NON-CANCER RISKS	
	MLE	RME	MLE	RME
Current Use				
• Dermal Exposure to Surface Water (Child)	5.0E-09	6.0E-08	<1	<1
• Inhalation of Ambient Air* (Child located at nearest school)	4.0E-05	4.0E-05	<1	<1
TOTALS	4.0E-05	4.0E-05	<1	<1
Potential Future Use				
• Ingestion of Ground Water	2.0E-04	1.0E-03	4 (adult) 7 (child)	7 (adult) 13 (child)
• Inhalation of VOCs from Ground Water	2.0E-04	2.0E-03	<1 (adult) <1 (child)	<1 (adult) <1 (child)
• Dermal Exposure to Ground Water	1.0E-08	7.0E-07	<1 (adult) <1 (child)	<1 (adult) <1 (child)
• Inhalation of Ambient Air* (Local residents)	9.0E-07 (adult) 2.0E-06 (child)	9.0E-07 (adult) 2.0E-06 (child)	<1 (adult) <1 (child)	<1 (adult) <1 (child)
TOTALS	4.0E-04	3.0E-03	4 (adult) 7 (child)	7 (adult) 14 (child)

*Risk estimates for the inhalation of ambient air pathway represent baseline conditions and assume that the LFGES is not in operation.
Source: OU3 RA (HLA, 1993).

For non-carcinogenic contaminants, the potential future land-use scenario exhibits total HIs in excess of 1 (see Table 4). These elevated HIs are associated with the hypothetical domestic use of ground water and are attributed to the individual exceedances of HQs for PCE (critical effect: liver), antimony (critical effect: blood), manganese (critical effects: the central nervous and respiratory systems), fluoride (critical effect: tooth enamel), and nickel (critical effect: body weight).

In summary, the risk analysis indicates that the greatest contributing pathway to the total cancer risk for a potential residential future land-use scenario would be the domestic use of ground water. Potential cancer risks for this pathway range from one person in one thousand to one person in one hundred at OU3/OU6. The risk (above background) of contracting cancer from ground water in the vicinity of the site is currently estimated to be highest southeast and northwest of the Landfill. The risk calculations also indicate that there is a potential for adverse health effects resulting from exposure to non-carcinogenic contaminants through groundwater ingestion.

3. Risk Associated with Methane Gas

Methane, the component of landfill gas that presents the greatest explosion risk, is combustible when present in air at concentrations between 5 percent and 15 percent. Potential explosive risks were virtually eliminated with the installation of the LFGES during the spring of 1991. However, if the LFGES were to malfunction, fail, or cease operating outside of the normal course of O&M activities, then explosive conditions could occur at the Landfill. It is not possible to quantitatively predict health risks that could be associated with failure of the system.

4. Environmental Risk

The potential hazards to environmental receptors were qualitatively evaluated in the OU3 RA. Terrestrial and aquatic habitats present at the Landfill were described and individual species known to occur in the vicinity were identified. No federally threatened or endangered plant or animal species are known to be present at the Landfill.

Exposure of terrestrial receptors to COCs in ground water is considered remote because ground water is not accessible except at the point of discharge into the marsh. Exposure point concentrations and maximum concentrations of COCs in surface water collected at the marsh were compared to federal ambient water quality criteria (AWQC) and state water quality standards for protection of aquatic life. Maximum surface water concentrations were lower than AWQC and state standards for all COCs having an established standard. Based on the expected chemical fate, incomplete exposure pathways, low chemical concentrations, and comparison of COC concentrations in

surface water to aquatic life protection criteria, environmental impacts associated with the Landfill are expected to be minimal.

In conclusion, the OU3 RA indicates that actual or threatened releases of hazardous substances from this Landfill, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

VII. DESCRIPTION OF ALTERNATIVES

A. Remedial Actions Already Implemented

Remedial actions that have already been implemented at the Landfill under the OU6 Removal Action include soil cover improvements, installation and operation of the LFGES, and construction of a perimeter fence and warning signs. In 1992, a soil cover system improvement program was initiated to address erosion, poor drainage, and lack of vegetative cover. Approximately 62,000 cubic yards of fill was placed in designated areas of the Landfill to provide a minimum cover depth of 2 feet. The soil cover was graded to improve runoff characteristics and revegetated to promote evapotranspiration and control erosion.

An active gas extraction system was installed in 1991 to control the accumulation of landfill gas and eliminate odors and toxic gas emissions. The LFGES consists of a series of 75 gas extraction wells interconnected by over 15,700 feet of piping. Two centrifugal blowers alternately operate to induce the flow of gases from the gas extraction wells. The extracted gas is conveyed to a 50-foot high enclosed flare system for treatment before release to the atmosphere. Condensate generated by the gas extraction system is collected in 4 sumps and conveyed to a 10,000 gallon storage tank. The condensate is discharged from the storage tank to a sanitary sewer for treatment in a publicly owned treatment works (POTW) operated by the City and County of Denver. Twenty-two gas monitoring probes (in addition to the 6 previously existing probes) were installed around the perimeter of the Landfill to monitor the performance of the LFGES. These probes are sampled monthly to monitor methane concentrations and gas pressure. The system is operated so that the concentration of methane within the probes does not exceed 5% by volume.

In an effort to limit human access to the Landfill, a 3-strand, smooth wire fence was erected around the perimeter of the Landfill in 1991. Signs are posted on the fence to warn against trespassing and hazardous conditions. In addition, EPA has issued an Access Order to Colorado Paint Company (CPC), which allows EPA, LI, and BNR to control the activities that can be conducted on the Landfill for a period of up to 25 years in order to protect the integrity of the response action. EPA has entered into an access agreement with the Colorado and Eastern Railroad Company (CERC) which allows

EPA and authorized representatives to conduct and maintain response actions on the CERC property. As discussed previously, EPA has also issued a Unilateral Order for OU6 that provides for implementing, operating, and maintaining the LFGES.

B. Alternatives Developed for the Landfill

The detailed analyses of remedial alternatives, presented in the Focused Feasibility Study (FFS) for OU3, resulted in the development of three alternatives for site remediation. These alternatives are summarized below:

1. Alternative 1: No Action

The Superfund program requires that the "No-Action" alternative be considered at every site. Under this alternative, EPA would take no action to control the source of contamination. However, groundwater monitoring and a site review would be conducted at least every five years.

Under this alternative, the operation of the LFGES would be discontinued. The landfill soil cover system and existing institutional controls would not be maintained, and the perimeter fence would not be repaired or maintained. Alternative 1 would therefore not provide for any additional remediation of affected media within OU3/OU6. Ceasing operation of the LFGES would likely result in an accumulation of landfill gas beneath the Landfill. Erosion would degrade the integrity of the landfill soil cover system. Natural fate processes, including degradation and attenuation, would continue to reduce contaminant concentrations in ground water over time. A groundwater monitoring program would be implemented, and periodic site reviews would also be conducted.

2. Alternative 2: No Further Action

The major components of this alternative are: continued operation and maintenance of the LFGES, continued maintenance of the landfill soil cover system, continuation of existing institutional controls, continued maintenance of the perimeter fence and warning signs, implementation of a groundwater and landfill gas monitoring program, and periodic site reviews.

Under this alternative, the LFGES would continue to extract and treat landfill gas and maintenance would be performed as necessary. A landfill gas monitoring program would be used to assess the operational performance of the LFGES.

The landfill soil cover system would be maintained. Revegetation and soil cover maintenance would be performed as necessary to maintain landfill appearance, promote

evapotranspiration, control runon and runoff, prevent excessive erosion of soil cover, and provide a barrier to direct contact with landfill contents.

Alternative 2 would include continued maintenance of the OU6 Administrative Order, OU6 Access Order, and the CERC access agreement. The perimeter fence and warning signs would be maintained in order to control access to the Landfill. Repairs would be made as necessary to the fence, and signs would be replaced if damaged or stolen to prevent trespassing.

Natural fate processes, including degradation and attenuation, would continue to reduce contaminant concentrations with time in ground water. A groundwater and landfill gas monitoring program would be implemented and periodic site reviews would also be conducted.

3. Alternative 3: Engineering and Institutional Controls

Under Alternative 3, a combination of institutional and engineering controls would be implemented in the vicinity of the Landfill to limit exposure to affected media. The major components of Alternative 3 are: continued operation and maintenance of the LFGES and continued maintenance of the soil cover system, with improvements to both as required during the normal course of operation and maintenance (O&M) activities; continued maintenance of the perimeter fence and warning signs; continuation of existing institutional controls; implementation of additional institutional controls, as necessary; implementation of a groundwater and landfill gas monitoring program; and periodic site reviews. If warranted, remedial action will be taken at OU3/OU6 if new information obtained from the groundwater monitoring program indicates that the Landfill contributes unacceptable levels of contamination to the ground water.

The Administrative Order for the OU6 LFGES, the Colorado Paint Company (CPC) Access Order, and the CERC access agreement already preclude certain activities at the site that would be inconsistent with or interfere with the response actions for OU6. Current zoning prohibits residential development on most of the Landfill (i.e., the CPC and BNR portions of the site). Additional institutional controls may be utilized as necessary in Alternative 3 to supplement the controls that are already in place to ensure that the response action remains effective. Furthermore, EPA would have continuing oversight authority over response actions at the Landfill. EPA approval may be required for activities at the site beyond continued O&M of the LFGES, the soil cover system, and fencing/warning signs to the extent that such activities would interfere with or be inconsistent with the response action. The primary purposes of the institutional controls would be: (1) to protect the integrity of the soil cover system in order to prevent dermal or direct contact with the landfill contents, (2) to prevent the use of ground water underlying the Landfill as a drinking water source, and (3) to protect the LFGES.

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In this section, alternatives developed for OU3/OU6 of the Sand Creek Industrial Superfund Site are evaluated and compared to each other using the nine evaluation criteria required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to identify the alternative that provides the best balance among the criteria. The relative performance of the alternatives is summarized by highlighting the key differences among the alternatives in relation to the following criteria:

1. Overall Protection of Human Health and the Environment
2. Compliance with Applicable, or Relevant and Appropriate Requirements (ARARs)
3. Long-Term Effectiveness and Performance
4. Reduction of Toxicity, Mobility, or Volume Through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

A. Criterion 1: Overall Protection of Human Health and the Environment

This criterion is categorized as a threshold criterion (i.e., alternatives must pass this criterion to remain in the evaluation). This criterion assesses the protection afforded by each alternative, considering the magnitude of the residual risk remaining at the site after the response objectives have been met. Protectiveness is determined by evaluating how site risks from each exposure route are eliminated, reduced, or controlled by the specific alternative. The evaluation also takes into account short-term or cross-media impacts that result from implementation of the alternative remedial activity.

Overall protection of human health and the environment would be provided by Alternatives 2 and 3. Alternative 1, the No-Action alternative, would not provide adequate protection of human health and the environment, because (1) ceasing operation of the LFGES would increase the likelihood of explosion and increase the potential for inhalation of landfill gas and (2) discontinuing maintenance of the soil cover system and the perimeter fence with warning signs would increase the potential for direct contact with landfill contents. Alternative 3 would provide even greater overall protection of human health and the environment than the current sufficient protection afforded by Alternative 2 because the implementation of additional institutional controls, as necessary, within OU3 would further reduce the risks associated with (1) potential future use of ground water and (2) potential for direct contact with landfill contents. In addition, Alternative 3 includes a provision for making improvements to the LFGES and

soil cover system, as required, to ensure adequate protection of human health and the environment.

B. Criterion 2: Compliance with ARARs

This criterion is also a threshold criterion in that all alternatives must attain ARARs to be considered as site remedies or, if ARARs are not attained a justifiable ARARs waiver must be obtained. Section 121(d) of the Superfund Amendments and Reauthorization Act (SARA) mandates that for all remedial actions conducted under CERCLA, cleanup activities must be conducted in a manner that complies with ARARs. The NCP and SARA have defined both applicable requirements and relevant and appropriate requirements as follows:

- Applicable requirements are those federal and state requirements that would be legally applicable, either directly, or as incorporated by a federally authorized state program.

- Relevant and appropriate requirements are those federal and state requirements that, while not legally "applicable," are designed to apply to problems sufficiently similar to those encountered at CERCLA sites that their application is appropriate. Requirements may be relevant and appropriate if they would otherwise be "applicable," except for jurisdictional restrictions associated with the requirement.

- Other requirements to be considered are federal and state non-regulatory requirements, such as guidance documents or criteria. Advisories or guidance documents do not have the status of potential ARARs. However, where there are no specific ARARs for a chemical or situation, or where such ARARs are not sufficient to be protective, guidance or advisories should be identified and used to ensure that a remedy is protective.

Federal and state ARARs which must be considered include those that are: chemical-specific, location-specific, and action-specific. Chemical-specific ARARs govern the extent of site cleanup in terms of actual cleanup levels. For example, Colorado Interim Organic Pollutant Standards (CIOPS) for stream segments classified for aquatic life and/or water supply are chemical-specific ARARs for the site. Location-specific ARARs govern natural site features such as wetlands, floodplains, and man-made features such as archeological and historic areas. Action-specific ARARs are technology or activity-based requirements that set restrictions on particular kinds of action at CERCLA sites.

Alternatives 1, 2, and 3 would comply with ARARs. Since no remedial action would be implemented under the No-Action alternative, there are no action-specific

ARARs for Alternative 1. Analyses of samples collected in the spring discharge area during the OU3 RI indicate that the CIOPS are not exceeded. The investigation of OU3 also revealed that there are no listed archeological or historic properties, or endangered or threatened species present at the Landfill. In addition, it is not expected that the remedial activities associated with OU3/OU6 would adversely impact any wetlands at or near the Landfill.

The next five criteria are designated as balancing criteria. These criteria are used to measure the positive and negative aspects of performance, implementability, and cost for each alternative.

C. Criterion 3: Long-Term Effectiveness and Permanence

The focus of this evaluation is to determine the effectiveness of each alternative with respect to the risk posed by treatment of residuals and/or untreated wastes after the cleanup criteria have been achieved. Several components were addressed in making the determinations, including:

- Magnitude of residual risk from the alternative.
- Likelihood that the alternative will meet process efficiencies and performance specifications.
- Adequacy and reliability of long-term management controls providing continued protection from residuals.
- Associated risks in the event the technology or permanent facilities must be replaced.

Comparison of alternatives with respect to long-term effectiveness and permanence indicates that Alternative 3 would provide the most effective and permanent remedial solution for OU3/OU6. Alternative 1 would not reduce the residual risk at the Landfill since it does not include provisions to maintain existing controls that would manage untreated materials at the Landfill. Under Alternative 1, hypothetical risks would likely increase after ceasing operation of the LFGES and discontinuing maintenance of the soil cover system. Alternative 3 is more effective and permanent than Alternative 2. Alternative 3 includes additional institutional controls, as necessary, and provisions for improvements to the LFGES and the soil cover system, as required. Therefore, Alternative 3 provides more reliable controls for future management of untreated materials at the Landfill than Alternative 2.

D. Criterion 4: Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion evaluates the ability of the alternatives to significantly achieve reduction of the toxicity, mobility, or volume of the contaminants or wastes at the site, through treatment. The criterion is a principal statutory requirement of CERCLA. This analysis evaluates the quantity of contaminants treated and destroyed, the degree of expected reduction in toxicity, mobility, or volume measured as a percentage of reduction, the degree to which the treatment will be irreversible, the type and quantity of residuals produced, and the manner in which the principal threat will be addressed through treatment. The risk posed by residuals will be considered in determining the adequacy of reduced toxicity and mobility achieved by each alternative.

Alternatives 2 and 3 would reduce the toxicity, mobility, or volume of landfill gas through extraction and treatment while landfill gas COC concentrations, mobility, and volume would likely increase under Alternative 1. Maintenance of the soil cover system would continue to reduce the mobility of landfill contents under Alternatives 2 and 3. The provision in Alternative 3 for modifications of the LFGES and the soil cover system, as required, ensures that reductions in toxicity, mobility and volume of landfill gas and reduction in the mobility of landfill contents would be maintained in the event of changing conditions at the Landfill. However, under present conditions, Alternatives 2 and 3 are essentially equivalent with respect to reducing toxicity, mobility, or volume.

Under Alternatives 2 and 3, the toxicity of landfill gas would be significantly reduced by the flare system, which incinerates the extracted gas. The mobility of landfill gas would be controlled through capture and extraction by the LFGES. Review of 1992 gas monitoring probe data indicates that the mobility of methane has been substantially reduced since operation of the LFGES began. The volume of landfill gas would be reduced through extraction and treatment by the LFGES. Currently, approximately 700,000 cubic feet of landfill gas per day are collected and treated by the LFGES.

The mobility of the landfill contents would be reduced through continued maintenance of the soil cover system and would thereby minimize the potential for direct contact with landfill contents. The soil cover system prevents transport of refuse by animals as well as by wind and erosion. The soil cover system does not contribute to a reduction in the toxicity or volume of the landfill contents. However, the toxicity of the landfill contents may be reduced by natural biodegradation.

Alternatives 2 and 3 would not provide a reduction in the toxicity, mobility, or volume of contaminated ground water beyond those processes occurring naturally. Reductions in toxicity as a result of natural attenuation and biodegradation processes may occur in ground water. Volatilization of organic compounds may result in a minor reduction in volume.

Alternative 1 would not reduce the toxicity, mobility, or volume of landfill gas, ground water, or landfill contents beyond what would occur through natural degradation and attenuation processes.

E. Criterion 5: Short-Term Effectiveness

The short-term effectiveness of each alternative was assessed based on the risk associated with the implementation of the remedial action to the community, workers, and environment and the time required to achieve the response objectives. Measures to mitigate releases and provide protection are central to this determination.

The evaluation of the alternatives indicate that all three are essentially equivalent with respect to short-term adverse environmental impacts and protection of the community and workers. With the exception of the groundwater monitoring program and additional institutional controls, as necessary, all remedial actions associated with Alternatives 2 and 3 have already been implemented. Alternative 3 may involve future improvements to the LFGES and soil cover system, but adverse short-term impacts should be minimized through standard engineering controls and adherence to standard health and safety practices. Because no remedial actions are proposed under Alternative 1, no potential short-term exposure to the community, construction workers, or additional impacts to the environment would occur as a result of implementing a remedial action.

F. Criterion 6: Implementability

This criterion analyzes technical feasibility, administrative feasibility, and the availability of services and materials. Technical feasibility assesses the difficulty of construction or operation of a particular alternative and unknowns associated with process technologies. The reliability of the technologies based on the likelihood of technical problems that would lead to project delays is critical in this determination. The ability to monitor the effectiveness of the alternative is also considered.

Administrative feasibility assesses the ease or difficulty of obtaining permits or rights-of-way for construction. Availability of services and materials evaluates the need for off-site treatment, storage, or disposal services, and the availability of such services. Necessary equipment, specialists, and additional resources are also evaluated in determining the ease by which these needs could fulfilled.

Each of the alternatives evaluated would be technically feasible. No additional construction, maintenance, or operations beyond those already existing would be required under any of the alternatives with the exception of Alternative 3, which may require improvements to existing systems. These improvements are expected to be readily implementable because no implementation difficulties were experienced during

the installation of the LFGES and improvement of the soil cover system. The groundwater monitoring program included in Alternatives 1, 2, and 3 is technically implementable because existing groundwater monitoring wells would be utilized to accomplish the proposed monitoring. The off-site monitoring of landfill gas included in Alternatives 2 and 3 is also technically implementable since existing monitoring probes would be used.

It is unlikely that the regulatory agencies or the public would accept shutdown of the LFGES as proposed under Alternative 1. Alternative 2 would be administratively feasible. Institutional controls, as necessary, in Alternative 3 would require additional legal effort to be implemented and would be dependent in certain instances on cooperation of property owners and municipalities or other governmental entities, and satisfaction of legal requirements. Alternative 2 would likely be the easiest to implement with respect to administrative feasibility because no additional actions would be required.

G. Criterion 7: Cost

Alternatives are evaluated for cost in terms of both capital costs and long-term O&M costs necessary to ensure continued effectiveness of the alternatives. Capital costs include the sum of the direct capital costs (materials, equipment, labor, land purchases) and indirect capital costs (engineering, licenses, or permits). Long-term O&M costs include labor, materials, energy, equipment replacement, disposal, and sampling necessary to implement the alternative. The objective of the cost analysis is to eliminate those alternatives that (1) do not provide measurably greater protection of human health and the environment, and (2) include costs that are substantially greater than those of other alternatives.

The present worth analysis is used to evaluate expenditures that would occur during different time periods. By discounting all costs to a common base year (i.e., 1992), the costs could be compared on the basis of a single figure for each alternative. Total present worth costs were calculated by multiplying the capital and O&M cost incurred during each year by the present worth factor. An interest rate of 5 % and a project duration of 30 years was used in accordance with EPA guidance.

The total present worth costs are identical ($7,283,000) for Alternatives 2 and 3 since the additional expenditures required for Alternative 3 (i.e., additional institutional controls and required improvements to the LFGES and soil cover system, as necessary) cannot be estimated. A total present worth cost of $4,316,000 is estimated for Alternative 1. Operation and maintenance costs incurred to date were included for Alternative 1, but future O&M for the LFGES and soil cover system were excluded since this alternative proposed discontinuation of these systems. Total annual O&M costs for Alternative 1 include only the implementation of a groundwater monitoring program and periodic site reviews and are estimated at $47,000. For both Alternatives 2 and 3, total

estimated capital costs and annual O&M costs are $3,170,000 and $240,000, respectively. However, capital costs for Alternative 3 are likely to be somewhat higher than indicated due to costs associated with additional institutional controls, if necessary.

H. Criterion 8: State Acceptance

This modifying criterion evaluates technical and administrative issues that may be raised by the State. EPA has involved CDH throughout the RI/FS and remedy selection process. The State of Colorado concurs with EPA's selected alternative, as presented in Section IX.

I. Criterion 9: Community Acceptance

This modifying criterion evaluates questions and comments on the Proposed Plan received from members of the community. It appears that the community supports EPA's selected remedy, as presented in Section IX. No comments on the Proposed Plan were received by EPA during the public comment period. Therefore, preparation of a Responsiveness Summary for this ROD was not necessary.

IX. SELECTED REMEDY

Based on consideration of the requirements of CERCLA and the detailed analysis of alternatives, EPA with the concurrence of the State of Colorado has determined that Alternative 3, Engineering and Institutional Controls, is the most appropriate remedy for OU3/OU6 of the Sand Creek Industrial Superfund Site. This remedy includes extraction and treatment of landfill gas; maintenance of the soil cover system and LFGES with improvements, as required; maintenance of the perimeter fence and warning signs; implementation of additional institutional controls, as necessary; implementation of a monitoring program and site reviews; and additional remedial action, as necessary, if monitoring indicates that the Landfill contributes to unacceptable contamination of ground water. The PRPs will be responsible for maintenance of each component of the remedy.

The detailed analysis of alternatives shows that for overall protection of human health and the environment; effectiveness; and reduction of toxicity, mobility or volume, the selected alternative is superior to Alternatives 1 and 2. The selected remedy and Alternative 2 are essentially equivalent in terms of technical and administrative feasibility, although cooperation of landowners or governmental entities may be necessary for implementation of certain additional institutional controls under the selected alternative. Costs for the selected remedy and Alternative 2 are also similar, however, there may be additional costs for the selected alternative due to costs

associated with additional institutional control implementation, if necessary, and any improvements required to the LFGES and soil cover system during the normal course of O&M activities.

The selected remedy incorporates removal, treatment, and containment technologies. The principal components of the selected alternative are described below in greater detail. Capital and annual O&M costs for these components are presented in Table 5.

Landfill Gas-Extraction System: The LFGES was installed within the boundaries of the Landfill during the spring of 1991 as part of the OU6 landfill gas Removal Action. The LFGES has the following primary components: seventy-five landfill gas-extraction wells; gas collection piping, consisting of a main header and 13 subheaders; four condensate sumps, piping, and a knockout pot; a 10,000-gallon condensate storage tank; two gas-extraction blowers and ancillary equipment; an enclosed gas flare system and a blower building; and 22 gas monitoring probes. Condensate collected in the storage tank is discharged via a sanitary sewer to the Denver Metro Central Treatment Plant. The LFGES is designed to capture as much of the landfill gas within the Landfill as possible and minimize its vertical and lateral migration via the extraction wells and gas collection piping. The enclosed flare system destroys odors and toxic components of the landfill gas. The gas monitoring probe network monitors the LFGES performance. Based on results from the gas monitoring probes and extraction wells sampled weekly and evaluated quarterly, the LFGES is adequately capturing methane and mitigating off-site gas migration. The preferred alternative provides for improvements or upgrades to the LFGES, as required.

Soil Cover System: Site improvements were undertaken at the Landfill during the spring of 1992 to enhance the integrity of the soil cover system and improve general erosion control and site appearance. The site improvements were also expected to improve O&M of the LFGES by reducing infiltration of ambient air into the Landfill. The site improvements consisted of: (1) the placement, grading, and compaction of approximately 62,000 cubic yards of fill material; (2) the placement of fill in low/eroded areas and the construction of terraces and straw bale dikes to control surface-water runoff; and (3) the revegetation of approximately 30 acres and interseeding of 8 acres of the Landfill. Under the preferred alternative, the soil cover system will be maintained (i.e., mowing the grass and spot reseeding as necessary) and improved as conditions at the Landfill warrant. The need for additional improvements to the soil cover system will be based on visual indications, such as surface erosion or a lack of vegetation.

Fencing: The Landfill is currently fenced with a 3-strand smooth wire fence that was installed in August 1991. Warning signs are posted around the entire perimeter of the fence. Maintaining the wooden fence posts, repairing broken strands of wire, and replacing warning signs as required will ensure that the fence will continue to be an effective deterrent to public access to the Landfill.

Table 5. Cost Summary for the Selected Remedy[a]

Capital Costs:	
• Landfill Gas Extraction System	- $2,470,000
• Landfill Soil Cover System	- $ 673,000
• Perimeter Fence	- $ 16,000
• Groundwater Monitoring Program Design	- $ 11,000
TOTAL CAPITAL COSTS	- $3,170,000
Estimated Annual O&M Costs:	
• Landfill Gas Extraction System	- $ 152,000
• Landfill Soil Cover System	- $ 40,000
• Groundwater Monitoring Program	- $ 36,000
• Periodic Site Assessment	- $ 11,400
TOTAL ANNUAL O&M COSTS	- $ 240,000 (rounded)
TOTAL PRESENT WORTH (1992 $)[b]	- $7,283,000 (rounded)

[a] The capital costs of the selected remedy are likely to be higher than indicated due to costs associated with implementation of additional institutional controls, as necessary. However, these costs were not included because of uncertainties in estimating costs associated with negotiating and implementing the additional institutional controls.

[b] Total present worth costs assume an annual discount rate of 5% and a project duration of 30 years.

Source: OU3 FFS (HLA, 1993).

Institutional Controls: The purposes of the institutional controls component of the selected alternative are (1) to protect the integrity of the soil cover system to prevent dermal or direct contact with the landfill contents, (2) to prevent the use of ground water underlying the Landfill as a drinking water source, and (3) to protect the LFGES operating at the Landfill. These objectives are already achieved in part through EPA oversight of the response action; state restrictions on permitting and constructing water wells in areas of known contamination; and maintenance of the existing controls under the OU6 Order, the CPC Access Order, and the Consent for Access on CERC property. Additional institutional controls that may be implemented as necessary include further EPA Orders issued pursuant to CERCLA § 106, judicial Consent Decrees under CERCLA § 122, zoning and subdivision regulations, building permits, recording requirements, state statutes, and local ordinances. Institutional controls currently in place at OU3/OU6 as well as available and potential supplemental institutional controls are summarized in Appendix A.

OU3 Monitoring Program: The OU3 monitoring program consists of groundwater and landfill gas monitoring components. Under the preferred alternative, both components will be implemented or continued. The duration of the OU3 monitoring program will be established in a Unilateral Order. The groundwater monitoring component is designed to assess changing conditions in Aquifers 0 and 2, and to continue evaluation of the Landfill's impact on groundwater quality. Key elements of the monitoring program include: annual sampling of 3 existing upgradient wells, annual sampling of 6 existing downgradient wells, annual sampling of one location at the spring discharge area, and proposed target analytes based on the results of the OU3 RI.

The landfill gas monitoring component was implemented with the startup of the LFGES in the spring of 1991. The perimeter network of 22 gas monitoring probes will continue to be monitored to evaluate the performance of the LFGES. In addition, six gas monitoring probes existing on the northwest perimeter of the Landfill prior to the OU6 Removal Action will also continue to be monitored to provide additional information regarding system performance and the migration of landfill gas. The LFGES is operated so that the concentration of methane within the monitoring probes does not exceed 5% by volume.

Data from both components of the OU3 monitoring program will support assessment of landfill conditions and LFGES performance as well as the need for improvements as provided for under the selected remedy. In addition, the data will be used to assess the site and ongoing activities during the periodic site review. In the future, if it is determined that the Landfill is responsible for unacceptable groundwater contamination, the remediation of ground water at the Landfill will be addressed under OU3.

X. STATUTORY DETERMINATIONS

EPA's primary responsibility at Superfund sites is to undertake remedial actions that achieve adequate protection of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete, the selected remedial action for a site must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified. The selected remedy must also be cost effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatments that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as their principal element. The following discussion addresses how the selected remedy meets these statutory requirements.

A. Protection of Human Health and the Environment

EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (1988) indicates that protectiveness may be achieved by reducing exposure through actions such as containment, limiting access, or providing an alternate water supply. The remedial actions described for the selected remedy will permanently address the principal threats to human health and the environment for OU3/OU6 through treatment to reduce the toxicity, mobility, and volume of landfill gas and containment of landfill contents. Concentrations of contaminants of concern in the spring discharge area do not exceed preliminary remediation goals, so remedial action objectives for aquatic life have been achieved. The risks associated with potential future activities at the Landfill will be addressed by the implementation of additional institutional controls, if necessary.

Though CERCLA favors active remediation, institutional controls may be implemented under CERCLA in appropriate circumstances. As provided by the Preamble to the NCP (55 Federal Register 8666, 8706 [March 8, 1990]):

> Examples of institutional controls, which generally limit human activities at or near facilities where hazardous substances, pollutants, or contaminants exist or will remain onsite, include land and resource use and deed restrictions, well drilling prohibitions, building permits, and well use advisories and deed notices. EPA believes ...that institutional controls have a valid role in remediation and are allowed under CERCLA (e.g., Section 121(d)(2)(B)(ii) appears to contemplate such controls). Institutional controls are a necessary supplement when some waste is left in place, as it is in most response actions. Also, in some instances where the balancing of tradeoffs among alternatives during selection of remedy process indicates no practicable way to actively remediate a site, institutional controls such as deed restrictions or well-drilling prohibitions are the only means available to provide protection of human health.

Institutional controls are particularly suited for application at municipal landfills. For example, as provided in EPA's *Conducting Remedial Investigation/Feasibility Studies for CERCLA Municipal Landfill Sites* (1991):

> For municipal landfill sites, the major purpose of deed restrictions is to protect the integrity of the cap. The restrictive covenant should limit subsurface development (excavation), excessive vehicular traffic (including off-road vehicles), and groundwater use. Additional deed restrictions may be required for effective implementation of other technologies. The permissible uses/limitations for the specific landfill property should be identified based on the risk the site poses and the remedial actions likely to be implemented.

B. Compliance with ARARs

All federal and state ARARs will be met by the selected remedy. Federal and state ARARs which must be considered include those that are: chemical-specific, location-specific, and action-specific. Potential ARARs identified for OU3/OU6 are provided below.

Chemical-Specific ARARs:

- Colorado Interim Organic Pollutant Standards (CIOPS) for Stream Segments Classified for Aquatic Life.

Sampling data from OU3 indicates that none of these standards are exceeded. Therefore, the selected alternative complies with this potential ARAR.

Location-Specific ARARs:

- Archeological and Historic Preservation Act, 16 USC § 469;40 CFR § 6.301(c).

The investigations of OU3 have not revealed any data that would trigger the effect of the Act or its regulations. The selected remedy will comply with this potential ARAR.

- National Historic Preservation Act (NHPA), 16 USC § 470; 40 CFR § 6.301(b); 36 CFR Part 800.

Studies of OU3 have not revealed any historic properties that would trigger the effect of this Act or its regulations. The selected alternative will comply with this potential ARAR.

- Colorado Register of Historic Places, Colo. Rev. Stat. § 24-80.1.101, et seq., 8 CCR 1504-5.

Studies of OU3 have not revealed any historic properties that would trigger the effect of this Act or its regulations. The selected alternative will comply with this potential ARAR.

- Endangered Species Act, 16 USC § 1531, et seq.; 50 CFR Part 17; 40 CFR § 6.302(h).

Studies of OU3 have not indicated the presence of any listed species that would trigger the effect of this Act or its regulations. The selected alternative will comply with this potential ARAR.

- Non-Game Endangered or Threatened Species Conservation Act, Colo. Rev. Stat. § 32.101, et seq.; 2 CCR 406-8.

Studies of OU3 have not indicated the presence of any listed species that would trigger the effect of this Act or its regulations. The selected alternative will comply with this potential ARAR.

- Executive Order on Protection of Wetlands, Executive Order No. 11990; 40 CFR § 6.302(a).

The U.S. Fish and Wildlife Service does not believe that the remedial activities associated with OU3 will adversely impact any wetland that may be present at or near the Landfill (letter dated June 6, 1991 from the U.S. Department of the Interior). Therefore, the Executive Order and its regulations are not ARARs for OU3. In the event that the OU3 remedial activities adversely impact any wetlands at OU3, the Executive Order and regulations may be ARARs.

Action-Specific ARARs and Guidance To Be Considered (TBC):

- Conducting Remedial Investigation/Feasibility Studies for CERCLA Municipal Landfill Sites (EPA, 1991).

EPA has provided guidance specifically intended to address the remediation of municipal landfills. In particular, the guidance addresses the type of cover suggested for municipal landfills and recognizes a soil

cover as sufficient to prevent dermal contact with landfill contents. It is apparent that EPA's municipal landfill guidance is not an ARAR (see NCP, 40 CFR § 300.400(g)(3)). However, as an Agency guidance, it may be a TBC for OU3.

- Potential Action-Specific ARARs Pertinent to Operation of the Gas Collection System at OU6, as set forth in the Sand Creek Industrial Superfund Site OU6 EE/CA (HLA, 1990).

  Gas Collection System:

  - Clean Air Act, 42 USC §§ 7401 et seq., National Ambient Air Quality Standards (NAAQS).

  NAAQS are ARARs for the Landfill. The landfill area is an attainment area for sulfur dioxide, nitrogen dioxide, and lead, and a non-attainment area for particulates, carbon monoxide, and ozone. However, since the gas collection system is not expected to exceed NAAQS levels during the remedial action, this requirement is relevant and appropriate.

  - Colorado Air Pollution Control Regulations, 5 CCR 1001-1 et seq.

  Based on experience with other similar gas removal systems and the performance of the OU6 LFGES to date, it is not expected that the LFGES will qualify as a major stationary source. However, if the gas collection system should ever qualify as a major stationary source, the pertinent substantive requirements applicable to major stationary sources in the Colorado Air Pollution Control Regulations would be potential ARARs.

  - Colorado Solid Waste Disposal Sites and Facilities Regulations, 6 CCR 1007-2, Section 2.

  These regulations include requirements concerning explosive gas concentrations at solid waste disposal facilities. Section 2.2.5 requires that explosive gas concentrations be monitored regularly. Section 2.2.6 limits explosive gas concentrations for solid waste facilities and requires that the concentration of explosive gases must not exceed 1% by volume of air within facility structures or 5% by volume of air at the site boundary. Section 2.4.4 provides that concentrations of explosive gases generated by the facility for solid waste disposal shall not exceed 5% in

the air at the site boundary after closure. These requirements are potential ARARs for the gas collection system.

Condensate Management:

- RCRA Subtitle C Requirements, 6 CCR 1007-3.

The condensate generated from operation of the LFGES should not be a hazardous waste because it is not a listed waste and it is not derived from a listed hazardous waste. Based on sampling of condensate from the LFGES and past experience with landfill condensate, it is not expected that concentration limits set forth in the TCLP rule will be exceeded or that the condensate will otherwise exhibit a characteristic of hazardous waste. Therefore, RCRA Subtitle C requirements should not be ARARs for the management of condensate. In the unlikely event that (1) the condensate exhibits a characteristic of a hazardous waste, and (2) the condensate is not managed in a manner excluded from RCRA Subtitle C regulation, requirements pertinent to the management of the condensate would be potential ARARs.

- Compliance with Colorado Discharge Permit System Regulations, 5 CCR 1002-2.

Substantive provisions of these regulations would be potential ARARs in the event that management of the condensate involved a point source discharge to Sand Creek. However, condensate will be stored in a 10,000-gallon storage tank and discharged to a POTW.

- Federal Pretreatment Regulations

Colorado has adopted the federal General Pretreatment Regulations for Existing and New Sources of Pollution, 40 CFR Part 403, as amended 55 Fed. Reg. 30082 (July 24, 1990). Therefore, Colorado regulations will not be more stringent than federal regulations, which are potential ARARs since the condensate will be discharged to a POTW.

- Local Pretreatment Rules

Section 121(d) of CERCLA does not require CERCLA response actions to comply with local laws (i.e., local laws by themselves are not

ARARs). While local pretreatment requirements technically are not considered to be ARARs, the LFGES is expected to comply with applicable provisions of these requirements.

C. Cost Effectiveness

The selected alternative is cost-effective in its approach to remediating landfill gas, containment of landfill contents, and restricting access to the site. The OU3 monitoring program will allow assessment of the conditions at the Landfill relative to (1) groundwater contamination attributable to the site and (2) accumulation and migration of landfill gas. The analysis of sampling data collected will allow for cost-effective decisions regarding any future improvements that may be required for the remedial systems. Total capital, annual O&M, and present worth costs for the selected remedy are $3,170,000; $240,000; and $7,283,000; respectively. However, if implementation of additional institutional controls are necessary, capital costs for the selected remedy are likely to be higher than indicated.

D. Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

The selected remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable for the 48th and Holly Landfill. Specifically, the use of the LFGES to extract and treat landfill gas results in a permanent reduction in methane and concentrations of COCs in landfill gas through thermal destruction. Condensate generated by the operation of the LFGES will be treated by a POTW. Because no hot spots were located within the Landfill, it was considered impractical and unnecessary to remediate landfill contents. Direct contact with landfill contents will be eliminated by containing the refuse beneath the landfill cap.

Of the alternatives that are protective of human health and the environment and comply with ARARs, EPA believes that the selected remedy provides the best balance in terms of long-term effectiveness and permanence; reduction in toxicity, mobility, or volume achieved through treatment; short-term effectiveness; implementability; cost; and the statutory preference for treatment as a principal element. Overall protection of human health and the environment, and long-term effectiveness and permanence were the most decisive criteria in selecting Alternative 3 as the preferred remedy.

The selected remedy offers greater overall protection of human health and the environment than afforded by Alternatives 1 or 2 because future potential exposure pathways for ground water are addressed through additional institutional controls, as necessary. Alternative 1 would not be protective of human health or the environment. The preferred alternative provides the greatest long-term effectiveness by including

provisions for future modifications and improvements to the LFGES and soil cover system as required during the normal course of O&M activities. The selected remedy and Alternative 2 are essentially equivalent with respect to the evaluation of compliance with ARARs; reduction of toxicity, mobility, or volume; short-term effectiveness; and implementability. Alternative 1 would not reduce residual risk associated with landfill gas, landfill contents, or groundwater exposure pathways; nor would it employ any treatment options that would reduce the toxicity, mobility, or volume of contaminants in the media of concern. Alternative 1 is also not likely to be administratively feasible. The additional capital expenditure for the selected alternative associated with implementation of additional institutional controls, as necessary, is not expected to be significant in comparison to Alternative 2.

E. Preference for Treatment as a Principal Element

The selected remedy satisfies the statutory preference for treatment as a principal element and is fully consistent with the NCP. Operation of the LFGES to extract and treat landfill gas addresses the principal threat posed by landfill gas. The LFGES will reduce the potential for explosion and inhalation hazards by mitigating the migration and accumulation of landfill gases. Combustible and toxic components of the landfill gas will be permanently destroyed through thermal destruction by the flare system. Condensate generated from the extraction of landfill gas will be treated by the Denver Metro POTW.

The size of the Landfill and the fact that there are no on-site hot spots that represent the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively. However, hazards associated with exposure to landfill contents will be minimized through containment by maintaining the soil cover system. Groundwater contamination attributable to the Landfill is not considered to be a principal threat, and potential exposure pathways for ground water have been addressed to the extent practicable.

Because this remedy will result in hazardous substances remaining on-site, a review will be conducted every five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

APPENDIX A

SUMMARY OF INSTITUTIONAL CONTROLS FOR OU3/OU6

Table A.1. Institutional Controls Currently in Place at OU3/OU6.

Institutional Control	Purposes of Institutional Control
OU6 Order	Requires implementation of methane gas recovery system; restricts activities to the extent that such activities conflict with response actions at OU6, and requires continued maintenance of response action.
Access Order	Allows access to CPC property by BN, LI and EPA in order to allow such parties to conduct OU6 removal action on CPC property; restricts present and future activities on CPC property which would interfere with removal action.
Consent for Access	Provides access for Response Actions to be conducted by EPA and its authorized representatives on CERC property.
EPA Oversight Activity	Precludes activities at site that would interfere with response actions, unless approved by EPA.
State of Colorado's Office of State Engineers, State Board of Examiners of Water Well Construction and Pump Installation Contractors (revised effective July 30, 1988), Rule 10.2.2	Precludes permitting and construction of wells in areas of known contamination.

Table A.2. Available Supplemental Institutional Controls.

Institutional Control	Purposes of Institutional Control
Commerce City Zoning "AG"	Limits the types of development allowed in the CERC property.
Commerce City Zoning "I-3"	Prohibits residential development on CPC property, and consequently prohibits water wells serving the residential development.
Denver Zoning "I-2"	Prohibits residential development on Burlington Northern property, and consequently prohibits water wells serving the residential development.
Denver and Commerce City Subdivision Regulations	Requires title check and review of proposed subdivision by various government agencies which should disclose any recorded information relating to the prior use of the Site as a landfill or any methane hazards disclosed therein.
Commerce City Subdivision Regulations	Requires water sampling in order to prevent use of unpotable water, if any, under the Site.
Denver and Commerce City Building Departments/Uniform Building Code	Requires soil borings and/or excavations to determine content of soils under proposed development site; prohibits issuance of building permits where dangerous conditions exist.
Denver and Commerce City Subdivision Regulations/Recording of other Documents in Appropriate Real Property Records	Requires recording in the appropriate county records of any existing or future Unilateral Order or Consent Decree affecting the Site. Such recording be disclosed by any title search required by the Subdivision Regulations and inform reviewing agencies of the prior use of the Site as landfill and/or any existing methane hazards.

Table A.3. Potential Additional Supplemental Institutional Controls

Institutional Control	Purposes of Institutional Control
Further EPA Orders issued pursuant to CERCLA § 106	May serve itself as institutional control and provide further use restrictions against property owners as necessary for response actions.
Judicial Consent Decree under CERCLA's § 122	May serve itself as institutional control and provide further use restrictions against property owners as necessary for response actions.
Correspondence to Colorado Land Use Commission and local governments requesting designation of Site as "Area of Interest" under the Land Use Act	To obtain a designation of the Site as a "Area of Interest" under the Colorado Land Use Act, requiring all potential developers to obtain a permit prior to development of any portion of the Site.
Ordinances adopted by Commerce City and/or Denver under their police powers.	To adopt well bans.
Easement in Gross	Voluntary landowner control granted to restrict development of property.
Colorado Excavation Statute/filing of appropriate notices with Denver and Adams County Clerk and Recorder	To require any potential developer on the property to provide notification of any proposed excavation on the Site.

APPENDIX B

United States Environmental Protection Agency Statement of Work – Remedial Design/ Remedial Action - Sand Creek Superfund Site Operable Units 3/6

STATEMENT OF WORK
REMEDIAL DESIGN / REMEDIAL ACTION
SAND CREEK SUPERFUND SITE
OPERABLE UNITS 3/6

Table of Contents

STATEMENT OF WORK
REMEDIAL DESIGN / REMEDIAL ACTION
SAND CREEK SUPERFUND SITE
OPERABLE UNITS 3/6

I. INTRODUCTION

A. PURPOSE OF THE STATEMENT OF WORK

This Statement of Work (SOW) has been prepared to establish the requirements for the Remedial Design/Remedial Action (RD/RA) program to be performed by the Respondents at the Sand Creek Superfund Site, 48th and Holly Landfill (the Landfill), Commerce City, Colorado, pursuant to Unilateral Administrative Order, Docket No. CERCLA VIII-93-27. This SOW details the procedures, tasks, and schedule that shall be followed by the Respondents in performing the selected remedial measures.

B. SITE DESCRIPTION

The Site shall refer to the definition of "the Landfill" as provided in the Unilateral Administrative Order and as described more fully in the Record of Decision (ROD).

C. PERFORMANCE STANDARDS

Performance Standards shall include cleanup standards, standards of control, quality criteria, and other substantive requirements, criteria, or limitations set forth in the ROD. These Performance Standards shall be found in the OU3/6 ROD.

II. ROLE OF EPA - EPA APPROVAL

Pursuant to Section IX of the Unilateral Administrative Order, EPA retains the right to approve or disapprove submittals during Remedial Design and Remedial Action. This action is administrative in nature to allow the Respondents to proceed to the next step in implementing the site remedy. This action may be taken for contractors, plans and specifications, processes, and other submittals within the context of the Unilateral Administrative Order. It does not imply any warranty of performance or that the remedy, when constructed, will meet Performance Standards or will function properly and be accepted.

III. SCOPE OF WORK TO BE PERFORMED

A. OBJECTIVES OF REMEDIAL DESIGN/REMEDIAL ACTION (RD/RA)

The purpose of the RD/RA program is to ensure that:

* Emissions of landfill gas are controlled to prevent inhalation at levels that pose an endangerment to human health or the environment.
* Accumulation of landfill gas is minimized to prevent explosion hazards.
* Dermal contact with landfill contents is prevented.
* The use of groundwater underlying the Landfill as a drinking water source is prevented.

Based on these objectives the Respondent will develop the RD/RA Work Plan which includes the following items:

- Introduction
- Project Participants
- RD/RA Tasks
- Operation & Maintenance
- Maps Detailing, the Locations of Groundwater Monitoring Wells
- Reporting and Schedule
- Cost Summary
- Health and Safety Plan - The Respondents will continue with and comply with the existing Health and Safety Plan which was in place during the Remedial Investigation/Feasibility Study and Removal Action work.

B. RD/RA TASKS

The remedial measures shall consist of the following tasks:

Task 1 - Continue Operation and Maintenance (O&M) of the landfill gas-extraction system (LFGES) with improvements, as required, during the normal course of O&M activities.

Task 2 - Continue maintenance of the soil cover system with improvements, as required, during the normal course of O&M activities.

Task 3 - Continue maintenance of the perimeter fence and warning signs.

Task 4 - Implement an environmental monitoring program.

Task 5 - Continue existing institutional controls and implement additional institutional controls, as necessary.

Task 6 - Conduct periodic site reviews.

The Respondents shall perform Tasks 1 through 4 consistent with the U.S. Environmental Protection Agency (EPA)-issued Record of Decision (ROD) and the schedules, specifications, and reporting requirements identified in this document and in the associated Unilateral Administrative Order. The Respondents shall also cooperate with EPA, as required, in the performance of Tasks 5 and 6.

C. OPERATION AND MAINTENANCE (O&M)

The Respondents shall perform and document the tasks described in Section B above in accordance with the plans and schedules detailed elsewhere in this document.

1. Landfill Gas-extraction System

Since the May 31, 1991 startup of the system, the LFGES has been in continuous operation except for brief periodic maintenance activities. After the first year ("shakedown") of operations, routine O&M of the LFGES was established. The Respondents shall continue O&M of the LFGES in accordance with the manufacturer's specifications and the EPA-approved final O&M Manual (1991), as amended. LFGES performance shall be monitored as part of the environmental monitoring program as specified in this SOW. The Respondents shall evaluate and implement, if necessary, improvements to the LFGES during the normal performance of O&M activities. Continuous operation of the LFGES may be modified, with EPA approval, if the monitoring data show that methane gas levels in the perimeter gas monitoring probes are below levels of regulatory concern.

2. Soil Cover System

Site improvement activities, including fill placement, erosion control, and reclamation, were undertaken at the Landfill during spring 1992 to enhance the integrity of the soil cover system, improve general erosion control and site

appearance, and improve O&M of the LFGES by reducing infiltration of ambient air into the Landfill. The Respondents shall continue maintenance of the soil cover system with the following activities:

- Periodic visual inspection of the cover during routine LFGES O&M activities at the Landfill
- Spot reseeding of areas as required to maintain grass cover
- Mowing as required to maintain grass cover and control weeds

The Respondents shall evaluate and implement, if necessary, improvements to the soil cover system during the normal performance of O&M activities.

3. Fencing

The Landfill is currently fenced with three-strand, smooth wire that was installed in August 1991. Warning signs are posted around the entire perimeter of the fence. The Respondents shall continue maintenance of the fence by performing the following activities, as needed

- Maintaining/repairing fence posts
- Repairing cut strands of wire
- Replacing warning signs

4. Environmental Monitoring Program

The Respondents shall implement an environmental monitoring program, which consists of (1) landfill gas monitoring and (2) groundwater monitoring. Data from both components of the monitoring program will support assessment of landfill conditions and LFGES performance. In addition, the data will be used to assess the site and ongoing remedial measures during the periodic site reviews. The appropriate reports as identified in Section IV of this SOW shall be submitted to document the activities and data resulting from the monitoring program.

a. Landfill Gas Monitoring

The landfill gas monitoring component of the environmental monitoring program was implemented with the startup of the LFGES on May 31, 1991. Landfill gas monitoring is required to evaluate the operation and performance of the LFGES and to ensure the effectiveness and continued safe operation of the system. On the basis of such monitoring, operational modifications may be made to the LFGES to

ensure the system extracts sufficient landfill gas to minimize vertical and horizontal migration and intrusion of atmospheric air into the Landfill. The existing landfill gas monitoring network of 28 gas monitoring probes located along the perimeter of the Landfill shall continue to be monitored to evaluate the performance of the LFGES and monitor for migration of landfill gas. Gas monitoring probes shall be monitored for percent methane and well pressure on a monthly basis to evaluate the effectiveness of the system and to modify operations to ensure prevention of lateral migration of gas in accordance with the EPA-approved final O&M Manual, as amended. Upon EPA review of the five year reviews, with EPA approval, if emissions from the landfill gas no longer pose an endangerment to human health and the environment, the LFGES and landfill gas monitoring may be modified or terminated. To achieve safe and efficient operation, the following parameters shall be monitored at least monthly at the following locations:

At each extraction well:

- Vacuum
- Gas temperature
- Methane concentration

At the flare:

- Gas flow rate
- Methane
- Flare temperature

Building inlet sample ports (on main header):

- Gas temperature
- Inlet vacuum

b. Groundwater Monitoring

The purpose of the groundwater monitoring component of the environmental monitoring program is to provide on a continuing basis a means by which potential impacts of the Landfill to groundwater quality can be assessed. Three existing upgradient and six existing downgradient wells will be sampled and measured for water levels semi-annually to provide a basis for comparison with previous results. The monitoring program will also include collecting one

groundwater discharge to surface-water sample semi-annually from the spring discharge.

Groundwater sampling locations include wells hydraulically upgradient and downgradient of the Landfill completed within Aquifer 0 and 2, the alluvial aquifers directly underlying the majority of the Landfill. Sampling locations were selected to provide a wide geographic distribution of monitoring locations along the perimeter of the Landfill. Sampling locations for the groundwater monitoring program are listed below.

- Upgradient of the Landfill
  - Aquifer 0 - two existing wells (L-2 and FIT-MW3)
  - Aquifer 2 - one existing well (SC-2B)
- Downgradient of the Landfill
  - Aquifer 0 - three existing wells (L-14, L-4, and L-15)
    - groundwater discharge to surface-water sample
  - Aquifer 2 - three existing wells (SC-9B, L-3, and SC-5B)

The analytical program and associated statistical evaluation will be established during the RD phase. After two years of monitoring, the constituents and monitoring locations may be modified, with EPA approval, if the statistical evaluation of pertinent groundwater monitoring data shows no significant degradation of groundwater quality directly attributable to the Landfill. The Respondents shall review the Quality Assurance Project Plan (QAPP) approved by EPA and propose any recommended changes to EPA. Therefore, groundwater sampling and analysis activities shall be conducted in conformance with a current EPA approved QAPP.

c. Well Abandonment Plan

The Respondent shall develop a Well Abandonment Plan that must contain the following:

- Recommended Groundwater Wells for abandonment
- Rationale for Abandonment
- Procedures used to abandon the well
- Procedures for disposal of contaminated well materials (if appropriate)
- Schedule for well abandonment

Additionally, a report shall be generated to describe the well abandonment results.

5. Institutional Controls

The primary purposes of institutional controls are to (1) protect the integrity of the soil cover system to prevent dermal or direct contact with the Landfill contents, (2) prevent the use of the groundwater underlying the Landfill as a drinking water source, and (3) protect the LFGES. Existing institutional controls identified in the ROD will be maintained. Additional controls will be implemented, if necessary, to ensure the RD/RA program objectives are met.

6. Site Reviews

The Respondents shall prepare a review every 5 years, evaluating the effectiveness of the remedy. The report shall include a summary of remedial activities conducted under this SOW and an interpretation of monitoring data collected under this SOW during the proceeding five years relative to the 48th and Holly Landfill. The first report will be submitted on or prior to September 25, 1995 (i.e., three months prior to the first five-year Sand Creek Site Review). Subsequent five year review reports will be due on the same day of the year every five years thereafter until completion of the obligations under the Unilateral Administrative Order and this SOW.

IV. REPORTING

The Respondents shall prepare the following reports:

A. REMEDIAL DESIGN REPORT

The Respondents shall submit the draft and final Remedial Design to EPA for review. The Remedial Design will describe the Respondents's plan for implementation of the Remedial Action within the terms and conditions of the Unilateral Administrative Order and this Statement of Work. It will contain at a minimum the following elements:

- Description of the work and field operations as specified in this SOW.
- Schedule of Remedial Action activities.
- Identification of the Remedial Action Team for construction management, including the key personnel, descriptions of duties, and lines of authority.

B. O & M REPORTS

O & M reports will be submitted semiannually to EPA for review. The O & M reports will include, at a minimum, the following elements:

- A description of O & M activities performed during the reporting period;
- A description of the performance of each component of the Remedial Action requiring O & M, including a summary of any monitoring data demonstrating the performance of the remedy and its effectiveness in meeting Performance Standards;
- A description and summary of the results of all monitoring performed in connection with the remedy;
- A statistical evaluation of the groundwater monitoring data and a conclusion as to whether the results exceed appropriate criteria, and whether any exceedances necessitate the implementation of contingency measures;
- Identification of any problems or potential problems and a description of all steps taken or to be taken to rectify the problems;
- An appendix containing all validated data and supporting documentation on Contract Laboratory Program Form I's or in a similar format for groundwater samples collected during the reporting period and not previously submitted; and
- Groundwater Monitoring Data in a format suitable for input into the Sand Creek Groundwater Data Base.

C. REMEDIAL ACTION COMPLETION REPORT

Once the remedy is performing according to design specifications, the Respondents shall submit the draft Site Remedial Action Completion Report (Completion Report) to the EPA for review. The process for documentation of Site completion is provided in OSWER Directive 9320.2-3A Procedures for Completion and Deletion of NPL Sites, April, 1989, and updated December, 1989. In addition, if available, the respondents will utilize the most current EPA guidance in preparing this report. Thirty days after EPA has reviewed the draft Completion Report, the Respondents shall submit the final Completion Report.

D. FIVE YEAR REVIEW REPORT

As described in Section 6 on Page 6, the Respondents shall prepare a review every 5 years, evaluating the effectiveness of the remedy. The Report shall include a summary of remedial activities conducted under this SOW and an interpretation of monitoring data collected under this SOW and an interpretation of monitoring data collected under this SOW during the preceding five years relative to the 48th and Holly Landfill. The first report will be submitted on or prior to September 25, 1995 (i.e., three months prior to the first five-year Sand Creek Site Review). Subsequent five year review rports will be due on the same day of the year every five years thereafter until completion of the obligations under the Unilaterl Administrative Order and this SOW. The Respondents shall cooperate with EPA, if requested, regarding the implementation of additional institutional controls identified in the ROD.

Schedule of Respondents Deliverables

Deliverable	Due Date
Notice that Respondents will comply with the UAO	Within 5 days after the effective date of UAO
Notification Designating Project Manager, Staff and Contractors	Within 7 days after the effective date of the UAO
Notification of changes in Project Manager, Staff or Contractors	At least 7 days prior to their Performing any Work
O & M Reports	In accordance with the RD
Five Year Review Reports	On September 25, 1995 and on the same date every five years thereafter
Draft RD/RA Work Plan (WP) Well Abandonment Plan Remedial Design	Within 90 days after the effective date of the UAO
Final RD/RA WP Well Abandonment Plan Remedial Design	Within 14 days after EPA review and comment on draft
Draft Remedial Action Completion Report	Within 45 days after EPA approval of the RD/RA WP
Final Remedial Action Completion Report	Within 30 days after EPA review and comment on draft Completion Report

APPENDIX C

Final Work Plan/ Remedial Design Report for Remedial Design/Remedial Action - 48th and Holly Landfill

Final Work Plan/Remedial Design Report For the Remedial Design/Remedial Action 48th and Holly Landfill Commerce City, Colorado

Prepared for

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7575 North Eldridge
Houston, Texas 77079

Burlington Northern Railroad
9401 Indian Creek Parkway
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HLA Project No. 27114 112

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July 29, 1994

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CONTENTS

TABLES

FIGURES

APPENDIXES

DISTRIBUTION

1.0 INTRODUCTION

This final Work Plan/Remedial Design (WP/RD) Report for the 48th and Holly Landfill (the Landfill), Sand Creek Industrial Superfund Site (Sand Creek Site), was developed pursuant to the Unilateral Administrative Order (UAO) for Remedial Design/Remedial Action (RD/RA), Sand Creek Operable Units (OUs) No. 3 and No. 6, U.S. Environmental Protection Agency (EPA) Docket No. CERCLA VIII-93-27. The WP/RD Report has been prepared by Harding Lawson Associates (HLA), on behalf of Browning-Ferris Industries of Colorado, Inc. (BFI of Colorado) and Burlington Northern Railroad (BNR) in accordance with the requirements set forth in the EPA Statement of Work (SOW), Exhibit 2 to the UAO. This WP/RD Report is also consistent with EPA correspondence provided to clarify requirements of the UAO (EPA, 1994f; 1994g) and with comments, as addressed, regarding the draft WP/RD Report (EPA, 1994h) (see Appendix B).

1.1 Purpose and Scope

The purpose of this WP/RD Report is to provide a basis and plan for completing the RD/RA for the Landfill and for performing long-term operation and maintenance (O&M) activities at the Landfill. This document combines requirements for both the WP and the RD, as well as those requirements for the well abandonment plan, in accordance with the EPA SOW.

1.2 Report Organization

The WP/RD Report is divided into nine sections. The remainder of Section 1.0 provides background information and identifies project participants. Section 2.0 presents the RD/RA tasks. Sections 3.0 and 4.0 further describe and detail the RD and RA tasks, respectively. Reporting requirements are explained in Section 5.0. Section 6.0 presents a schedule of activities. Costs are summarized in Section 7.0. Sections 8.0 and 9.0 provide acronyms and a bibliography, respectively.

1.3 Background

This section provides a brief description and recent history of the Landfill. Detailed background information is provided in the Record of Decision (ROD) (EPA, 1993) and associated administrative record.

1.3.1 Landfill Description

The Sand Creek Site is located partly within the City and County of Denver (CCD), Colorado, and partly within Commerce City in Adams County, Colorado (Figure 1.1). The Landfill is in the southern portion of the Sand Creek Site and is bordered on the north by East 52nd Avenue, on the south by East 48th Avenue, and on the west by Dahlia Street. The surface area of the Landfill is approximately 150 acres.

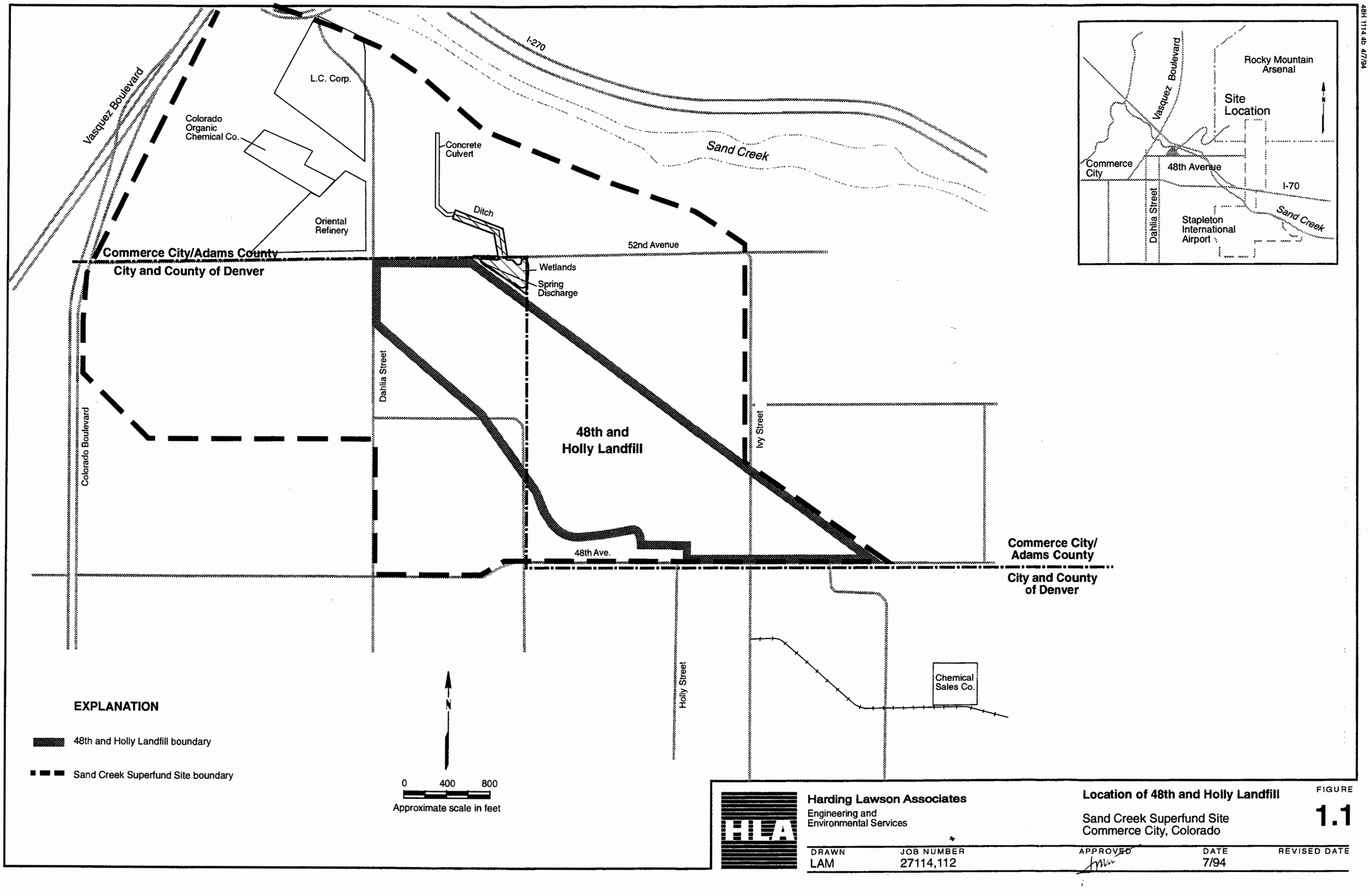
EPA defined six OUs within the Sand Creek Site as follows:

- OU 1: Within the Colorado Organic Chemical Company source area, 10 cubic yards (cy) of soil highly contaminated with pesticides; subsurface soil contaminated with volatile organic compounds (VOCs); and contaminated buildings and tanks
- OU 2: Contaminated soil in the vicinity of the L.C. Corporation property
- OU 3: Contaminated groundwater, surface water, sediment, soil, and air in the vicinity of the Landfill
- OU 4: Contaminated groundwater underlying the Sand Creek Site
- OU 5: Within the Colorado Organic Chemical Company source area, surface soil to a depth of 5 feet with contaminant concentrations greater than action levels and less than or equal to 1000 parts per million (ppm)
- OU 6: Gaseous emissions from the Landfill

1.3.2 Recent Activities

On February 8, 1990, EPA issued Administrative Order on Consent Re: Remedial Investigation and Feasibility Study for Operable Unit 3, Docket No. CERCLA VIII-90-08 (AOC). BFI of Colorado (then Landfill, Inc.) and BNR performed the work in accordance with the OU 3 AOC and completed the following major deliverables (among others) documenting the work:

48H 1114.4b 4/7/94



Harding Lawson Associates
Engineering and Environmental Services

Location of 48th and Holly Landfill

Sand Creek Superfund Site
Commerce City, Colorado

FIGURE **1.1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
LAM	27114,112		7/94	

- Revised Final Remedial Investigation Report - June 3, 1992
- Final Revised Risk Assessment Report - February 4, 1993
- Final Focused Feasibility Study Report - March 19, 1993

On August 15, 1990, EPA issued Unilateral Administrative Order for Removal Action for Operable Unit 6, Docket No. CERCLA-VIII-90-20, which addressed risks associated with gaseous emissions from the Landfill. The Engineering Evaluation/Cost Analysis (EE/CA) was approved by EPA on December 11, 1990. The Final Design Submittal for the OU 6 Landfill Gas-extraction System (LFGES) was approved by EPA on January 28, 1991. Major completed milestones associated with the OU 6 UAO include:

- Construction start - February 25, 1991
- Prefinal inspection - May 30, 1991
- System startup - May 31, 1991
- Final inspection - June 26, 1991
- Final Removal Action Report - October 31, 1991

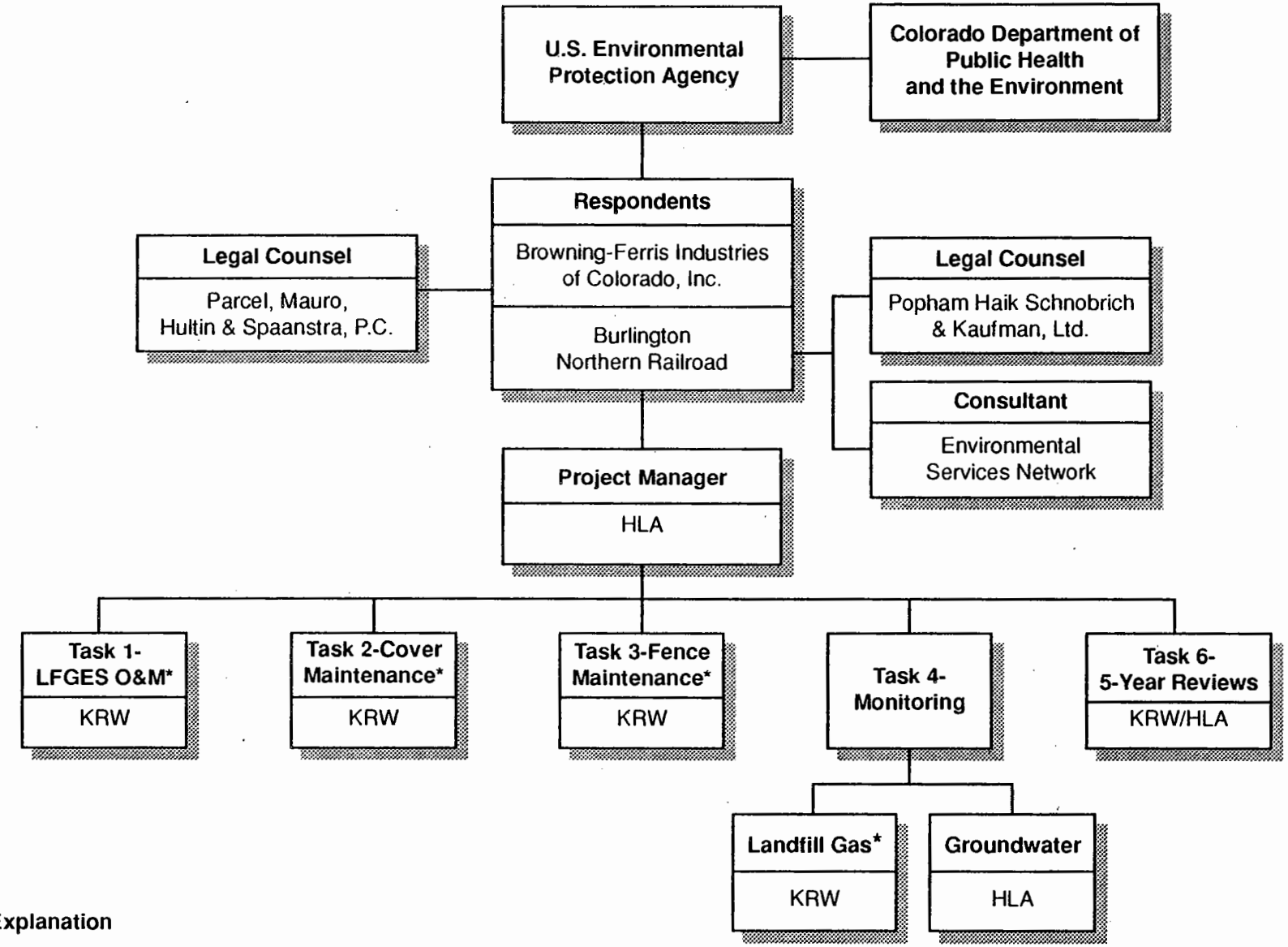
EPA issued the Proposed Plan for OU 3/OU 6 to the public on March 19, 1993. On June 30, 1993, EPA issued a ROD for OU 3/OU 6 that identified a remedial action developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), applicable state laws, and the National Contingency Plan (NCP), Title 40 Code of Federal Regulations Part 300. Subsequently, EPA issued the UAO for RD/RA at OU 3 and 6, which became effective January 31, 1994.

1.4 Project Participants

A project organization chart for the RD/RA at the Landfill is presented in Figure 1.2. This organization was identified earlier in the notification of selection of project manager submitted February 8, 1994, by Parcel, Mauro, Hultin & Spaanstra, P.C. (PMHS), on behalf of BFI of Colorado and BNR,

pursuant to the UAO for RD/RA. As shown in Figure 1.2, BFI of Colorado and BNR plan to continue utilizing the services of legal and technical consultants who participated in previous OU 3 and OU 6 activities. EPA acknowledged selection of the project manager in its correspondence to PMHS dated March 21, 1994.

48H 1175 4/4/94



Explanation

* Ongoing activities

HLA Harding Lawson Associates

KRW KRW Consulting, Inc.

LFGES O&M Landfill gas-extraction system operation and maintenance

Harding Lawson Associates
Engineering and Environmental Services

Project Organization Chart
Remedial Design/Remedial Action
48th & Holly Landfill
Commerce City, Colorado

FIGURE
1.2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
LAM	27114,112		7/94	

2.0 REMEDIAL DESIGN/REMEDIAL ACTION TASKS

The purpose of the RD/RA program is to ensure that:

- Emissions of landfill gas are controlled to prevent inhalation at levels that pose an endangerment to human health or the environment
- Accumulation of landfill gas is minimized to prevent explosion hazards
- Dermal contact with landfill contents is prevented
- The use of groundwater underlying the Landfill as a drinking water source is prevented

In the ROD for OU 3/OU 6, EPA established that a remedial action alternative comprising engineering and institutional controls was the most appropriate remedy for the Landfill. The remedy consists of the following tasks:

- Task 1 - Continue O&M of the LFGES with improvements, as required, during the normal course of O&M activities
- Task 2 - Continue maintenance of the soil cover system with improvements, as required, during the normal course of O&M activities
- Task 3 - Continue maintenance of the perimeter fence and warning signs
- Task 4 - Implement an environmental monitoring program
- Task 5 - Continue existing institutional controls and implement additional institutional controls, as necessary
- Task 6 - Conduct periodic site reviews

Tasks 1 through 3, the landfill gas monitoring portion of Task 4, and Task 5 are already ongoing as part of long-term O&M. Task 6, by nature, does not represent a remedial measure requiring "design."

The groundwater monitoring portion of Task 4 has not yet been implemented. The design tasks associated with this activity include:

- Development of the groundwater monitoring program
- Development of the well abandonment plan

The two design tasks cited above were completed as part of the remedial design phase of the project and are documented in Section 3.0 of this report.

3.0 REMEDIAL DESIGN

3.1 Groundwater Monitoring Program

This section describes the groundwater monitoring program to be implemented as part of the RA activities at the Landfill. This section presents the hydrogeologic conceptual model and the groundwater monitoring locations, and describes the nature and frequency of monitoring and data collection, data evaluation, and data management activities for the groundwater monitoring program.

3.1.1 Objective

As specified in the ROD and in the EPA SOW, the objective of the groundwater monitoring program is to assess on a continuing basis the potential impact of the Landfill on the quality of groundwater downgradient of the Landfill. To achieve this objective the groundwater monitoring program was designed to:

- Evaluate changes in groundwater quality downgradient of the Landfill within Aquifers 0 and 2
- If changes are observed, evaluate whether these changes are related to impacts from the Landfill

3.1.2 Hydrogeologic Conceptual Model

Identification of aquifers in the vicinity of the Landfill was previously established during the Sand Creek RI (EPA, 1988) and further developed during the OU 4 RI (URS Consultants, Inc. [URS], 1993). The aquifers identified by EPA appear to reasonably define the hydrogeologic system in the vicinity of the Landfill. Three discrete aquifers have been identified within the unconsolidated alluvial sediment overlying bedrock in the vicinity of the Landfill. Figure 3.1 shows the distribution in plan view of the three alluvial aquifers in the vicinity of the Landfill.

In the southeastern portion of the Landfill, Aquifer 0 is the only alluvial aquifer present, directly overlying bedrock or fine-grained alluvial sediments overlying bedrock. In the central part of the Landfill, Aquifer 0 exists under perched conditions above Aquifer 2. Aquifer 0 is unconfined

throughout the area beneath the Landfill. Groundwater flow within Aquifer 0 is generally toward the north to northwest. The potentiometric surface of Aquifer 0 is shown in Figure 3.2.

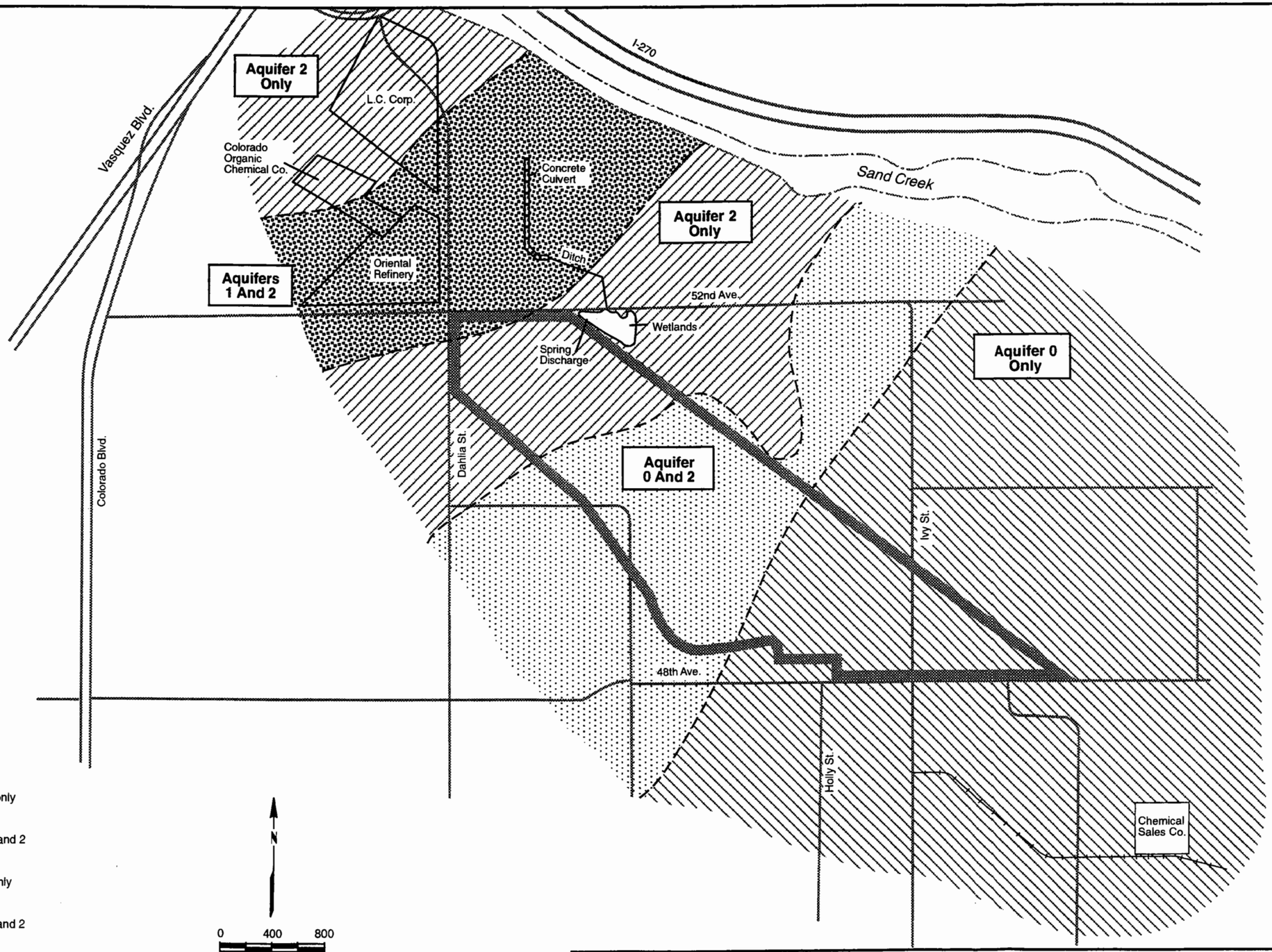
Aquifer 0 receives recharge from upgradient of the Landfill and discharges to Aquifer 2 where the confining unit separating these aquifers pinches out. Aquifer 0 also discharges to the spring located north of the Landfill through a drain located beneath the Landfill, as described below. The direction of groundwater flow in Aquifers 0 and 2 is generally consistent with the regional flow direction of the alluvial system reported by EPA.

Aquifer 2 is the lowermost alluvial aquifer and is present over the western two-thirds of the Landfill. Where present, Aquifer 2 overlies bedrock or fine-grained alluvial sediments overlying bedrock. Aquifer 2 exists under confined conditions to the west and northwest of the Landfill but is unconfined beneath the Landfill and south of the Landfill. Groundwater flow within Aquifer 2 is generally to the north. The potentiometric surface of Aquifer 2 is shown in Figure 3.3.

Aquifer 1 is present in the extreme northwestern portion of the Landfill. Aquifer 1 is unconfined and is separated from Aquifer 2 by a fine-grained confining unit.

The only major surface-water feature in the vicinity of the Landfill is a 1-acre marsh located just north of the north end of the Landfill. The marsh receives water derived from Aquifer 0 that discharges to a spring via a pipe. The pipe is connected to finger drains installed to divert seeps that originated along the escarpment before landfilling operations began. Drainage from the marsh passes under 52nd Avenue where it flows along an unlined ditch for several hundred feet before entering a concrete-lined culvert that eventually discharges into Sand Creek.

48H 1063.3b 4/11/94



EXPLANATION

- Estimated extent of Aquifer 0 only
- Estimated extent of Aquifers 0 and 2
- Estimated extent of Aquifer 2 only
- Estimated extent of Aquifers 1 and 2
- Landfill boundary

N

0 400 800

Approximate scale in feet

Source: Revised Final Remedial Investigation Summary Report, Operable Unit 3, 48th and Holly Landfill (HLA, 1992)

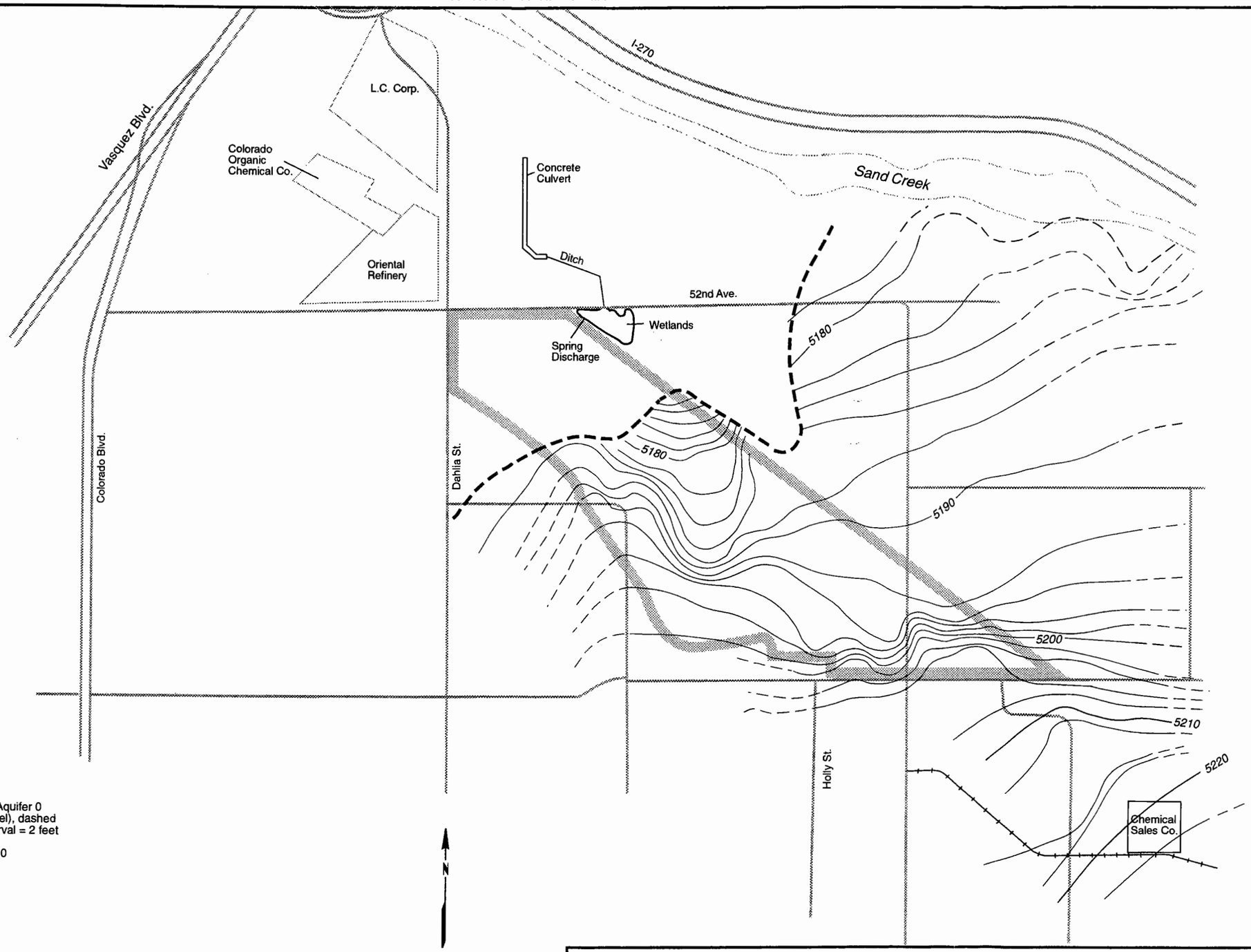
HLA

Harding Lawson Associates
Engineering and Environmental Services

Estimated Areal Extent of Alluvial Aquifers in Plan View
48th and Holly Landfill
Commerce City, Colorado

FIGURE **3.1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
LAM	27114,112		7/94	



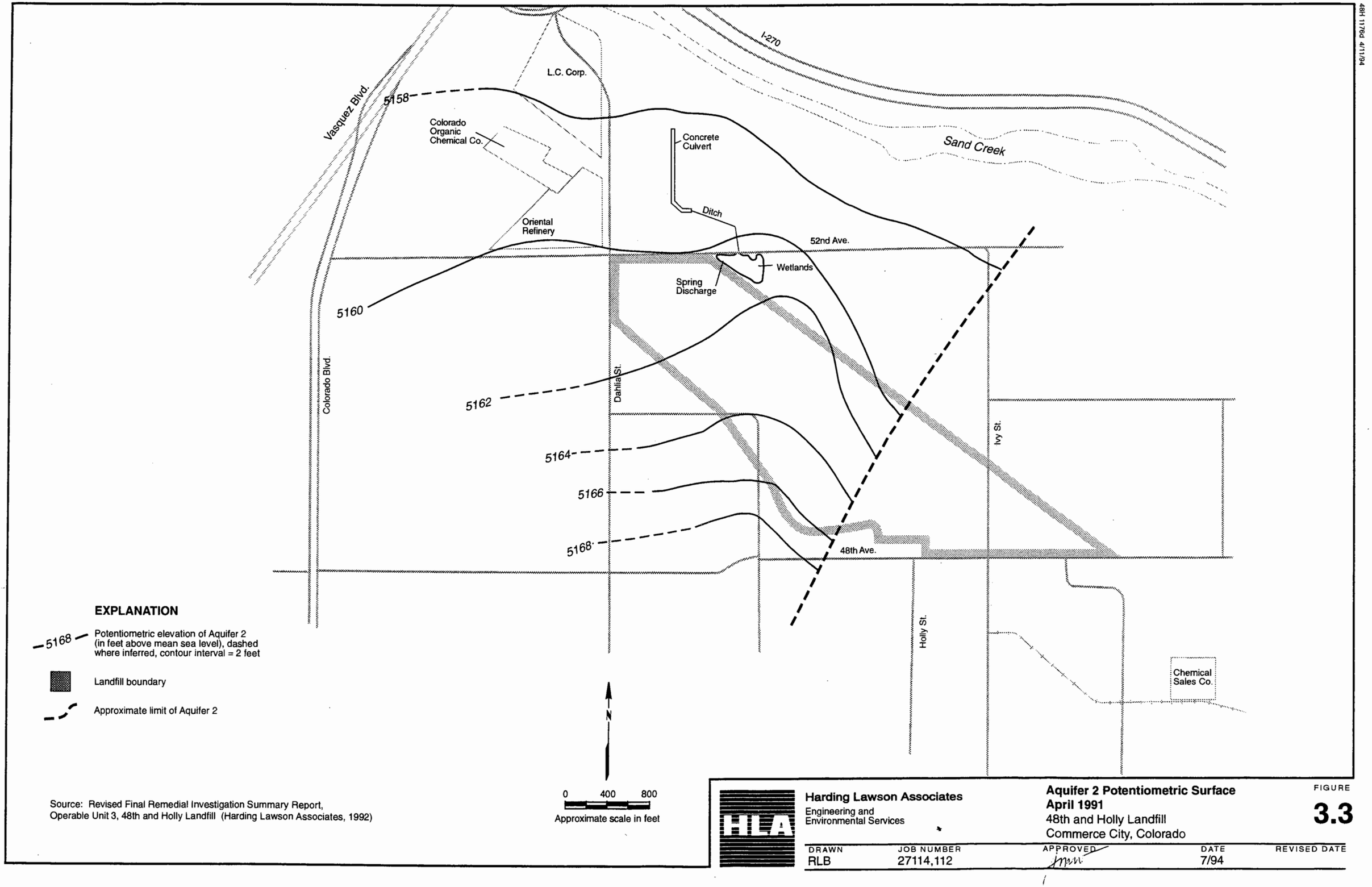
Source: Revised Final Remedial Investigation Summary Report, Operable Unit 3, 48th and Holly Landfill (Harding Lawson Associates, 1992)

Harding Lawson Associates
Engineering and Environmental Services

Aquifer 0 Potentiometric Surface
April 1991
48th and Holly Landfill
Commerce City, Colorado

FIGURE
3.2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RLB	27114,112		7/94	



Source: Revised Final Remedial Investigation Summary Report, Operable Unit 3, 48th and Holly Landfill (Harding Lawson Associates, 1992)

Harding Lawson Associates
Engineering and Environmental Services

Aquifer 2 Potentiometric Surface
April 1991
48th and Holly Landfill
Commerce City, Colorado

FIGURE **3.3**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RLB	27114,112		7/94	

3.1.3 Groundwater Monitoring Locations

To achieve the objective of the groundwater monitoring program, nine existing groundwater monitoring wells will be used as specified in the EPA SOW. These wells are located hydraulically upgradient and downgradient of the Landfill and are completed within Aquifers 0 and 2, underlying the majority of the Landfill. The locations of these groundwater monitoring wells are shown in Figure 3.4.

Three monitoring wells are located upgradient of the Landfill. These include wells L-2 and FIT-MW3 completed within Aquifer 0, and well SC-2B completed within Aquifer 2. These monitoring wells will be used to evaluate upgradient water quality.

Six monitoring wells are located downgradient of the Landfill. These include wells L-14, L-4, and L-15 completed within Aquifer 0, and wells L-3, SC-5B, and SC-9B completed within Aquifer 2. These monitoring wells will be used to monitor and evaluate potential changes in groundwater quality downgradient of the Landfill. Downgradient water quality will be compared with upgradient water quality to evaluate whether the Landfill is impacting the quality of groundwater downgradient of the Landfill.

One sample will be collected at the surface location of the groundwater discharge to the spring. Results of analysis of this sample will provide additional information regarding the quality of groundwater in Aquifer 0.

3.1.4 Data Collection

The following sections describe the data collection activities including water-level measurements and groundwater sampling. Before initiating monitoring activities, a field evaluation of the selected monitoring locations will be performed. This field evaluation will take into consideration factors such as current integrity and materials of construction given that the wells have been idle for

approximately three years. If the current conditions of any monitoring location are found to be unsuitable for long-term monitoring, a replacement well will be identified.

Sampling and analysis procedures to be followed during implementation of the groundwater monitoring program will be described in an addendum to the existing field sampling plan, the Final Sampling Plan for the OU 3 RI/FS (HLA, 1991) (FSP). Quality assurance/quality control (QA/QC) procedures to be followed will be described in the updated Quality Assurance Project Plan (QAPP). Health and safety guidelines will be described in the updated Health and Safety Plan (HSP) (see Section 4.2.2.).

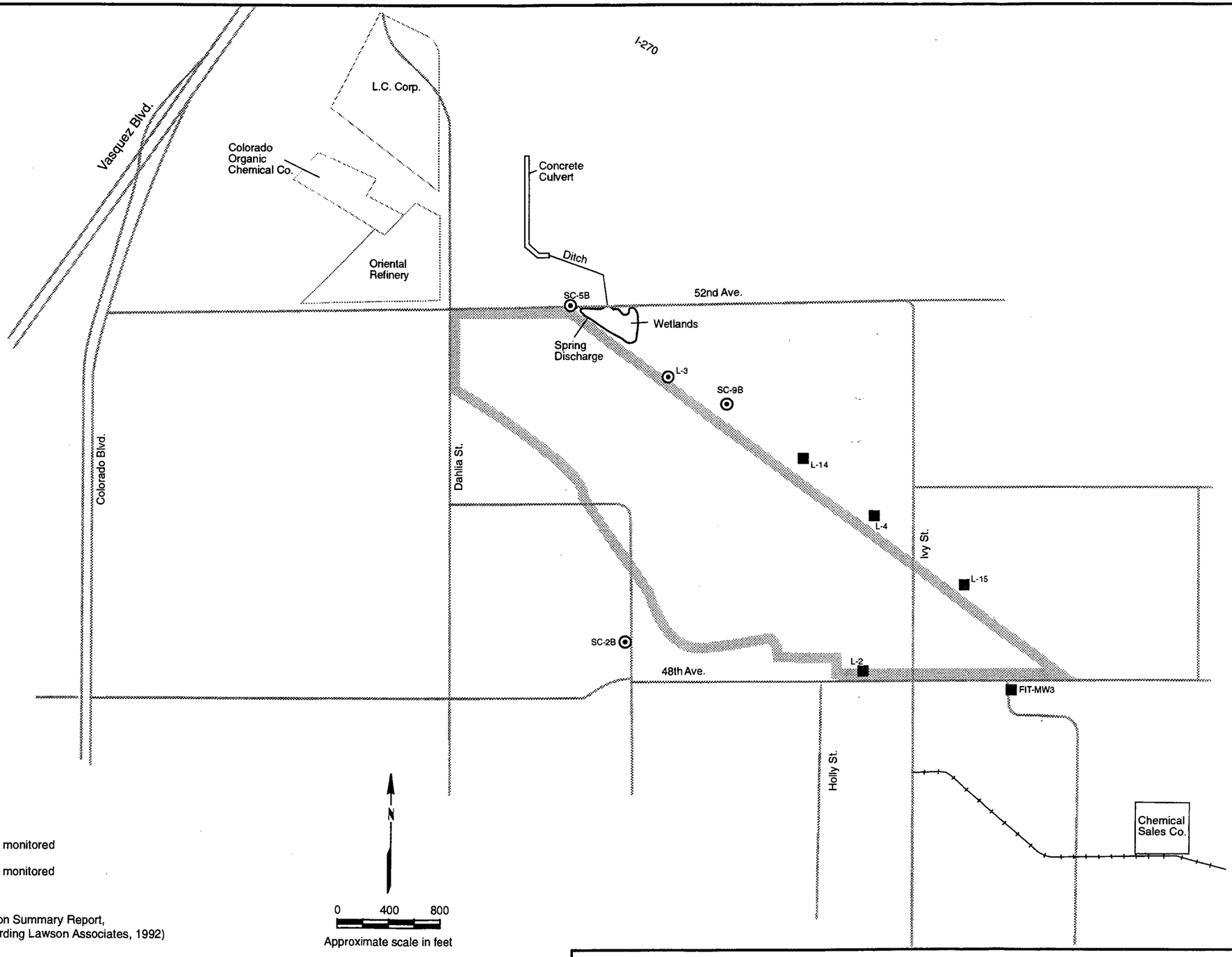
3.1.4.1 Water-level Measurements

Water levels will be measured in the nine selected groundwater monitoring wells upgradient and downgradient of the Landfill. Water-level measurements will be recorded semiannually concurrent with the groundwater sampling events.

Water-level measurements will also be collected in selected existing monitoring wells upgradient of the Landfill and downgradient of the Chemical Sales Company (CSC) site. The specific additional monitoring wells selected for water-level measurements will be listed in the updated FSP. These measurements will be collected at an appropriate frequency relative to the schedule for remediation at the CSC site to evaluate whether the groundwater flow patterns beneath the Landfill are affected by pumping or other activities that may be occurring during remediation of the CSC site. Such changes in the groundwater flow patterns, if they occur, may have significant impact on the interpretation of the data collected during the groundwater monitoring program associated with the Landfill.

3.1.4.2 Groundwater Sampling and Chemical Analysis

Groundwater samples will be collected semiannually from the nine groundwater monitoring wells and at the groundwater discharge to surface water-location. Groundwater sampling procedures are



EXPLANATION

- Existing Aquifer 2 monitoring well to be monitored
- Existing Aquifer 0 monitoring well to be monitored
- Landfill boundary

Source: Revised Final Remedial Investigation Summary Report, Operable Unit 3, 48th and Holly Landfill (Harding Lawson Associates, 1992)

Harding Lawson Associates
Engineering and Environmental Services

Groundwater Monitoring Well Network
48th and Holly Landfill
Commerce City, Colorado

FIGURE **3.4**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RLB	27114,112		7/94	

briefly described in Section 4.2.4 and will be detailed in the updated FSP. Groundwater samples will be collected and preserved in accordance with requirements provided in Table 3.1. The sample containers will be cleaned and prepared in accordance with EPA specifications and quality control procedures for sample containers, as specified in Section 5.3 of the QAPP.

As a result of discussions with the EPA Remedial Project Manager regarding the draft WP/RD Report, groundwater samples will be analyzed for volatile organics and metals as shown in Table 3.2. The analytes selected represent Landfill chemicals of concern that are also of sitewide interest. The analytical methods to be used in the groundwater monitoring program will be taken from the EPA Contract Laboratory Program (CLP) Statements of Work. The specific method references are contained in Table 3.3.

Method-specific QA/QC procedures will be performed. In addition, sufficient documentation and raw data will be provided with the analytical report of results to allow for data validation as described in the QAPP and an assessment of the quality, usability, and defensibility of the data. The documentation for organics analyses will include, whenever applicable, instrument performance or tuning checks, initial calibration data, continuing calibration data, method blank results, internal standard data, surrogate results, matrix spike/matrix spike duplicate results, and target compound identification/quantitation data. Documentation for metals will include, whenever applicable, initial instrument calibration data, initial calibration checks, continuing calibration data, calibration blank results, preparation blank results, duplicate results, matrix spike results, and target analyte identification/quantitation data. Any additional QA/QC results and documentation produced by the laboratory during the analyses will be provided. Chain-of-custody documentation will be submitted as well as pertinent information concerning dates of sample collection, preparation, extraction, and analysis to allow the data validator to evaluate whether technical holding times were met.

3.1.5 Data Evaluation

This section describes the methods that will be used to evaluate the data collected during the groundwater monitoring program including methods for evaluating the water-level data and the groundwater analytical data.

3.1.5.1 Analysis of Water-level Data

Water-level data will be collected for the nine selected wells during each sampling event and may be collected more frequently, as appropriate, for additional monitoring wells upgradient of the Landfill and in the vicinity of the CSC site upon initiation of remedial activities at the CSC site (as indicated in Section 3.1.4.1). Water-table maps will be constructed by plotting water-level data next to each well location and contouring the data. The maps will be used to evaluate the groundwater flow patterns in the vicinity of the Landfill and to assess any temporal changes in the groundwater flow directions and hydraulic gradient direction and magnitude. Water-level data will be used to (1) evaluate whether activities associated with the remediation of the CSC site, such as pumping, are affecting the groundwater flow pattern upgradient and beneath the Landfill and (2) to assess the impact of such changes on the Landfill groundwater monitoring program.

3.1.5.2 Analysis of Chemical Data

As was discussed at the July 14, 1994, project meeting with EPA, the requirement for a statistical evaluation of groundwater data as specified in the UAO has been eliminated at EPA's request. As a result of subsequent discussions with EPA, chemical data will be qualitatively evaluated to assess, on a continuing basis, potential impacts of the Landfill to groundwater quality as specified in the UAO. It is anticipated that the data evaluation process will include (1) an evaluation of data resulting from the current monitoring event and (2) a comparison of current data with historical data collected for the well network. Evaluation of groundwater data will be included in the semiannual O&M Report as described in Section 5.3.

Table 3.1: Containers, Preservation, Packaging, and Shipping Requirements

Analysis	Bottles and Jars	Preservation	Holding Time	Volume of Sample	Shipping	Normal Packaging
Volatile Organics	Two 40-ml glass vials with Teflon septum-lined cap	Iced to 4°C in dark storage	10 days	Fill completely, no air bubbles	Delivered daily	Bubble pack
Metals	One-1-liter polyethylene bottle	Filtered, HNO_3 to pH < 2.0, iced to 4°C	6 months	Fill 90 percent full	Delivered Daily	Bubble pack

ml Milliliter
°C Degrees Celsius

Table 3.2: Analytical Program

Volatile Organics
Benzene
Chloroform
1,1-Dichloroethene (1,1-DCE)
1,2-Dichloroethene (1,2-DCE)
Tetrachloroethene (PCE)
1,1,1-Trichloroethane (1,1,1-TCA)
Trichloroethene (TCE)
Vinyl chloride

Metals
Antimony
Arsenic
Manganese

Table 3.3: Summary of Analytical Methods for Analysis of Groundwater

Target Analytes	Method	Method Description
Volatile Organics	CLP SOW Doc. No. OLC01.0*	Gas chromatography/mass spectrometry
Antimony and Manganese	CLP SOW Doc. No. ILM02.0*	Inductively coupled argon plasma
Arsenic	CLP SOW Doc. No. ILM02.0*	Graphite furnace atomic absorption

CLP Contract Laboratory Program
SOW Statement of Work

* Or more current version, if available.

The current monitoring data evaluation will consider the following:

- The field sampling program. Information gained during collection of groundwater samples will be used to assess data quality and usability.
- The analytical program. Information gained from the laboratory during analyses of groundwater samples will also be used to assess data quality and usability as referenced above in Section 3.1.4.2.
- Analytical results. A data table consolidating results for the nine selected wells and one groundwater to surface-water discharge sample will be developed. This table will reflect the current groundwater conditions in the vicinity of the Landfill.

The comparison of current data with historical data will focus on the identification of trends, if any, and the nature of the trends (i.e., increasing or decreasing) over time. Conditions/activities in other areas of the Sand Creek Site, upgradient of the Landfill, and at the CSC site will be evaluated, as appropriate, for potential impacts on groundwater monitoring results. Data tables and data plots will be developed, as required, to support interpretations presented regarding quality of groundwater in the vicinity of the Landfill.

Additional tables and maps will be prepared to clarify results of the groundwater monitoring program as situations warrant. BFI of Colorado and BNR recognize the need for adequate documentation of the groundwater monitoring program, both for near-term reporting requirements as well as for support of five-year reviews and delisting of the Sand Creek Site.

3.1.6 Data Management

Data collected during the groundwater monitoring program will be entered into a computerized database to facilitate retrieval, handling, and analysis of data. The data storage and information system capabilities include:

- Preparing, sorting, and entering data into computerized data storage files
- Providing stored data points with associated QA/QC qualifiers that indicate the level of confidence or quality of data. These qualifiers indicate what QA/QC activities were included in the major steps of the monitoring process and quantitatively describe the precision/accuracy of the analysis.

- Supporting future data analysis

Information stored in the computerized database will include the following:

- Well identification, well construction information, well survey information, and water-level measurements
- Groundwater sample identification numbers, date of collection, depth, type, and analytical laboratory
- Analytical results for groundwater and data qualifiers

Data will be entered via a keyboard or computer disks provided by the chemical laboratories. Data will be checked against chain-of-custody forms, hard copies of the laboratory reports, field measurements, or other documents. Data will be entered when received. Access to the analytical database will be restricted to authorized personnel. Backup duplicates on computer disks will be made whenever the database has been modified. Data from field instrumentation may periodically be transferred via modem, in ASCII format using appropriate communication software as required.

3.1.7 Well Maintenance

Maintenance of wells in the monitoring network will be implemented subsequent to the field inspection described in Section 3.1.4 and the first monitoring event. Activities will include inspection and repair tasks necessary for maintaining the wells in a condition suitable for long-term monitoring.

3.2 Well Abandonment Plan

BFI of Colorado and BNR recommend abandoning well C-4 as part of the RA field activities. Well C-4 was installed within the eastern portion of the Landfill on Colorado Paint Company property in 1984. The gravel filter pack in well C-4 extends to within 2 feet of the base of the Landfill, and the integrity of the seal above the filter pack is uncertain. Therefore, as indicated in the OU 3 RI report (HLA, 1992a), water quality results reflect direct impact from the Landfill and do not represent water quality in Aquifer 0 beneath the Landfill. As such, use of well C-4 for groundwater monitoring purposes is not planned, and the well should be abandoned. Procedures for abandoning

well C-4 and the disposal of well materials (if appropriate) are described in Section 4.3. These procedures will be applicable to potential future well abandonment activities.

4.0 REMEDIAL ACTION/OPERATION AND MAINTENANCE

As indicated in Section 2.0, the remedy selected by EPA for OU 3/OU 6 comprises engineering and institutional controls. This section details ongoing remedial actions and those to be implemented pursuant to this plan upon EPA approval.

4.1 Remedial Actions Already Implemented

Previously implemented remedial actions at the Landfill include the OU 6 LFGES, landfill soil cover system improvements, fencing, landfill gas monitoring, and institutional controls. These remedial actions are described below.

4.1.1 Task 1 - Landfill Gas-extraction System

An active gas-extraction system was installed within the boundaries of the Landfill in 1991 as part of OU 6 activities to control the accumulation of landfill gas and minimize odors and components of the landfill gas that could pose an endangerment to public health or the environment. The LFGES consists of a series of gas extraction wells interconnected by gas collection piping. Two centrifugal blowers that connect to a single point in the gas collection piping and operate alternately induce the flow of gases from the gas-extraction wells. The gas is diverted to an enclosed flare system for treatment before it is emitted to the atmosphere. Condensate generated in the gas collection piping is piped to a condensate storage tank before being discharged to a sanitary sewer. Condensate is pumped to the sanitary sewer by a submersible pump suspended in the condensate storage tank. Major components of this system are presented in Figure 4.1 and are further described as follows. The majority of the information regarding the OU 6 LFGES is documented in the Final Removal Action Report (HLA, 1991e).

Gas-extraction Wells

Seventy-five landfill gas-extraction wells were installed at the Landfill. Extraction wells were installed by drilling 36-inch-diameter boreholes to the bottom of the refuse. The base of the Landfill was assessed visually by the absence of trash in the drill cuttings. Extraction wells consist of solid

and perforated 6-inch high-density polyethylene (HDPE) pipe. The length of perforated pipe was determined by the depth of refuse. The length of solid pipe is 12 feet for wells 30 feet deep or less and 15 feet for wells more than 30 feet deep. Extraction wells are protected at the ground surface by fiberglass well encasements with removable locking lids.

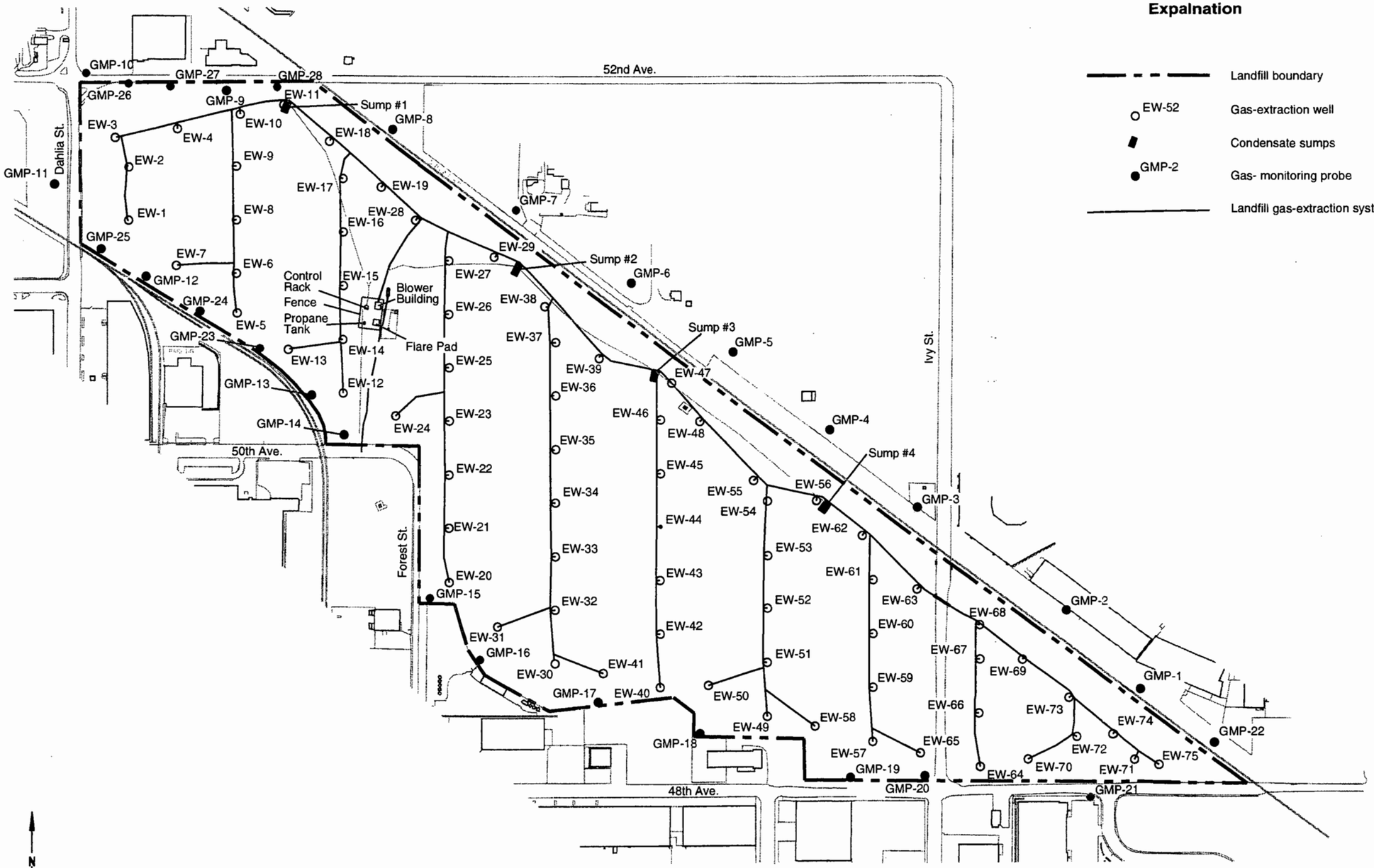
Piping

Approximately 15,700 feet of HDPE pipe were installed at the Landfill to transport landfill gas from the extraction wells to the enclosed flare system. Pipe was installed by excavating into the refuse and placing the pipe on compacted sand bedding as designed. Buried piping was backfilled using refuse-free soil. The landfill gas collection piping was installed with a minimum slope of 2 percent to allow condensate to drain into one of four condensate sumps located at low points in the piping system.

Blower Building

A 22-foot-wide by 26-foot-long, preengineered metal building was installed at the Landfill to house a condensate knockout pot and two centrifugal blowers. The building is equipped with an explosion-proof exhaust fan to provide ventilation and an explosionproof heater to prevent freezing of condensate in the knockout pot.

The centrifugal blowers were mounted in the blower building to draw gas from the extraction wells. The outlet of the blowers is piped to the enclosed flare system. A knockout pot constructed of HDPE was also installed in the blower building to capture condensate in the gas stream. Before entering the blowers, gas is diverted through the knockout pot. The knockout pot is equipped with a sight glass to monitor the fluid level and a manual drain system that is connected to the 10,000-gallon condensate storage tank.



Expalnation

- Landfill boundary
- EW-52 — Gas-extraction well
- Condensate sumps
- GMP-2 — Gas- monitoring probe
- Landfill gas-extraction system piping

48th & Holly\27114100 7/29/94 LDZ

Harding Lawson Associates
Engineering and Environmental Services

Major Components of the Landfill Gas-extraction System
48th and Holly Landfill
Commerce City, Colorado

FIGURE **4.1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
LDZ	27114,112		7/94	

Condensate Sumps

Condensate sumps were installed at four locations in the gas collection piping. The condensate sumps are located at low points in the gas collection piping system to allow the condensate in the piping to drain by gravity. Condensate drains to the sumps and is transferred to the 10,000-gallon condensate storage tank using a submersible pump suspended in each sump. Approximately 2800 feet of HDPE condensate piping were installed to transfer condensate from tanks located in each of the four condensate sumps. The submersible pumps are automatically activated by electronic level controls in the sumps.

Condensate Storage Tank

An underground condensate storage tank was installed to collect condensate from the condensate sumps located in the gas collection piping and the knockout pot located in the blower building. The tank is double-walled and constructed of fiberglass-reinforced plastic with a condensate-holding capacity of 10,000 gallons. The annular space between the primary and secondary tanks is filled with a colored brine solution for leak detection during and after installation. A monitoring system continuously monitors the level of brine solution in the annular space and provides an audible and visual alarm that will sound if a leak occurs from the primary tank.

Enclosed Flare System

An enclosed flare was installed for the purpose of flaring collected gases. The enclosed flare system consists of a 50-foot-tall by 8-foot-diameter stack with three burners, flare pilot assembly, purge blower, and control panel. A propane tank supplies the flare pilot assembly with fuel to ignite a pilot flame. Landfill gas entering the system is diverted through the burners and ignited by the flare pilot assembly.

Gas Monitoring Probes

Twenty-two gas monitoring probes were installed around the perimeter of the Landfill to monitor gas-extraction system performance. (Six existing gas monitoring probes are maintained and monitored as part of the probe network.) The landfill gas monitoring program is detailed in Section 4.1.4.

Since the startup of the system on May 31, 1991, the LFGES has been in continuous operation except for brief periodic maintenance activities. After the first year of operations (shakedown), routine O&M of the LFGES was established. To date approximately 7200 gallons of condensate have been generated, of which approximately 5500 gallons have been discharged to the sanitary sewer. KRW Consulting, Inc. (KRW), on behalf of BFI of Colorado and BNR, will continue O&M of the LFGES in accordance with the equipment manufacturer's specifications and the EPA-approved final O&M Manual (HLA, 1992a), as amended. Performance of the LFGES will continue to be monitored as described in Section 4.1.4. BFI of Colorado and BNR will evaluate and implement, if necessary, improvements to the LFGES during the normal performance of O&M activities. Pursuant to the EPA SOW, continuous operation of the LFGES may be modified or terminated, with EPA approval, if the monitoring data indicate that methane gas levels in the perimeter gas monitoring probes are below levels of regulatory concern.

4.1.2 Task 2 - Soil Cover System

In 1992, a soil cover system improvement program was implemented to address erosion, poor drainage, and lack of vegetative cover identified during the normal course of O&M activities at the Landfill. The program included the following.

Fill Placement

Fill placement was undertaken in the areas of the Landfill where the thickness of the cover material was less than 2 feet. Areas where the cover was less than 2 feet thick were identified from two data sources: (1) seventy-five boring logs that coincided with the construction of the landfill-gas extraction wells and (2) forty-five soil borings performed with a hand auger to assess the cover

thickness between the areas where the 75 landfill gas-extraction wells were installed. Based on these soil borings, a fill plan was devised to ensure a uniform cover thickness of 2 feet.

Fill placement activities included (1) preparing the site (clearing and recompaction), (2) delivering approximately 62,000 cubic yards of fill to the Landfill, (3) placing the fill in the designated areas, (4) grading the fill to the elevations specified, and (5) compacting the fill. Revegetation, which was conducted for the areas of the Landfill that received fill, included a native seed mixture, an organic fertilizer, a mulch, crimping, and application of a tackifier.

Erosion Control

Erosion control activities were performed for the areas of the Landfill where channelized flow, high flow velocities, and/or erosion to the existing cover were jeopardizing cover integrity. Fill was placed and compacted in existing gullies, trenches, and depressions that were caused by erosion. Several terraces were constructed across portions of the Landfill where the potential for runoff was high. Also, several straw bale dikes were constructed to control runoff. The straw bale dikes were constructed in areas that historically experienced severe erosion.

Reclamation

Reclamation activities were performed over approximately 30 acres of the Landfill that were void of perennial vegetation. Any existing vegetation was disked and tilled to prepare the soil surface for revegetation. Revegetation involved applying the following materials: (1) a native seed mixture, (2) an organic fertilizer/soil amendment, (3) a mulch, and (4) a tackifier. In addition to the revegetation, approximately 8 acres of the Landfill were interseeded. Interseeding was performed in those areas that contained weak strands of grass, poor quality vegetation, and/or annual plants. Interseeding involved applying a native seed mixture to the existing vegetation with a drill seeder.

KRW, on behalf of BFI of Colorado and BNR, will continue maintenance of the soil cover system. Ongoing maintenance includes the following:

- Periodic visual inspection of the cover during routine LFGES O&M activities at the Landfill
- Spot reseeding of areas as required to maintain grass cover
- Mowing as required to maintain grass cover and control weeds

BFI of Colorado and BNR will evaluate and implement, if necessary, improvements to the soil cover system during the normal performance of the O&M activities.

4.1.3 Task 3 - Fencing

A three-strand, smooth-wire fence was installed around the perimeter of the Landfill in 1991 as part of the OU 6 activities. The wires are equally spaced and supported by 4-foot-high steel posts. Warning signs are posted along the entire length of the fence. KRW, on behalf of BFI of Colorado and BNR, will continue maintenance including the following:

- Maintaining/repairing fence posts
- Repairing cut strands of wire
- Replacing warning signs

4.1.4 Task 4 - Environmental Monitoring Program (Landfill Gas Monitoring)

The landfill gas monitoring component of the environmental monitoring program was implemented with the startup of the LFGES. Landfill gas monitoring is performed to evaluate the operation and performance of the LFGES and to maintain the effectiveness and continued safe operation of the system. On the basis of such monitoring, operational modifications can be made to ensure the system extracts sufficient landfill gas to minimize vertical and horizontal migration and intrusion of atmospheric air into the Landfill. KRW, on behalf of BFI of Colorado and BNR, will continue to monitor the following parameters at least monthly at the following locations:

- At each extraction well
  - Vacuum
  - Gas temperature

  - Methane concentration
- At the flare
  - Gas flow rate
  - Methane
  - Flare temperature
- Building inlet sample ports (on main header)
  - Gas temperature
  - Inlet vacuum

Additionally, KRW will monitor, on a monthly basis, the gas monitoring probes along the landfill perimeter for percent methane and well pressure to evaluate the performance of the system and to modify operations to prevent lateral migration of gas.

If gaseous emissions from the Landfill no longer pose an endangerment to human health and the environment, the LFGES and landfill gas monitoring may be modified or terminated, with EPA approval.

4.1.5 Task 5 - Institutional Controls

The primary purposes of institutional controls are to: (1) protect the integrity of the soil cover system to prevent dermal or direct contact with landfill contents, (2) prevent the use of the ground-water underlying the Landfill as a drinking water source, and (3) protect the LFGES. The perimeter fencing and signs deter access to the Landfill, warn against trespassing, and identify the hazardous conditions. As described above in Section 4.1.3, the Landfill fencing will continue to be maintained as part of the remedial action. Also, current zoning prohibits residential development on most of the Landfill (i.e., the Colorado Paint Company and BNR portions; see Figure 4.2).

In addition, EPA has issued an access order to Colorado Paint Company that allows EPA, BFI of Colorado, and BNR, and their authorized representatives to control the activities that can be

conducted on the Colorado Paint Company property for a period of up to 25 years to protect the integrity of the remedy in place for the Landfill (in the Matter of Sand Creek Industrial Superfund Site, Denver, Colorado, Colorado Paint Company, Respondent, Administrative Order Directing Compliance with Request for Access to Conduct Removal Action, Docket No. CERCLA VIII-91-07 [Colorado Paint Access Order]). Likewise, EPA has entered into an access agreement with the Colorado and Eastern Railroad Company that allows EPA and its authorized representatives to conduct and maintain response actions on the Colorado and Eastern Railroad Company property (Consent for Access to Property, August 20, 1990. [Colorado and Eastern Access Agreement]).

Additional institutional controls may be implemented, if necessary, to ensure the RD/RA program objectives are met. BFI of Colorado and BNR will cooperate with EPA pursuant to the EPA SOW in the implementation of additional institutional controls, if required, under Task 5.

4.2 Task 4 - Environmental Monitoring Program (Groundwater Monitoring)

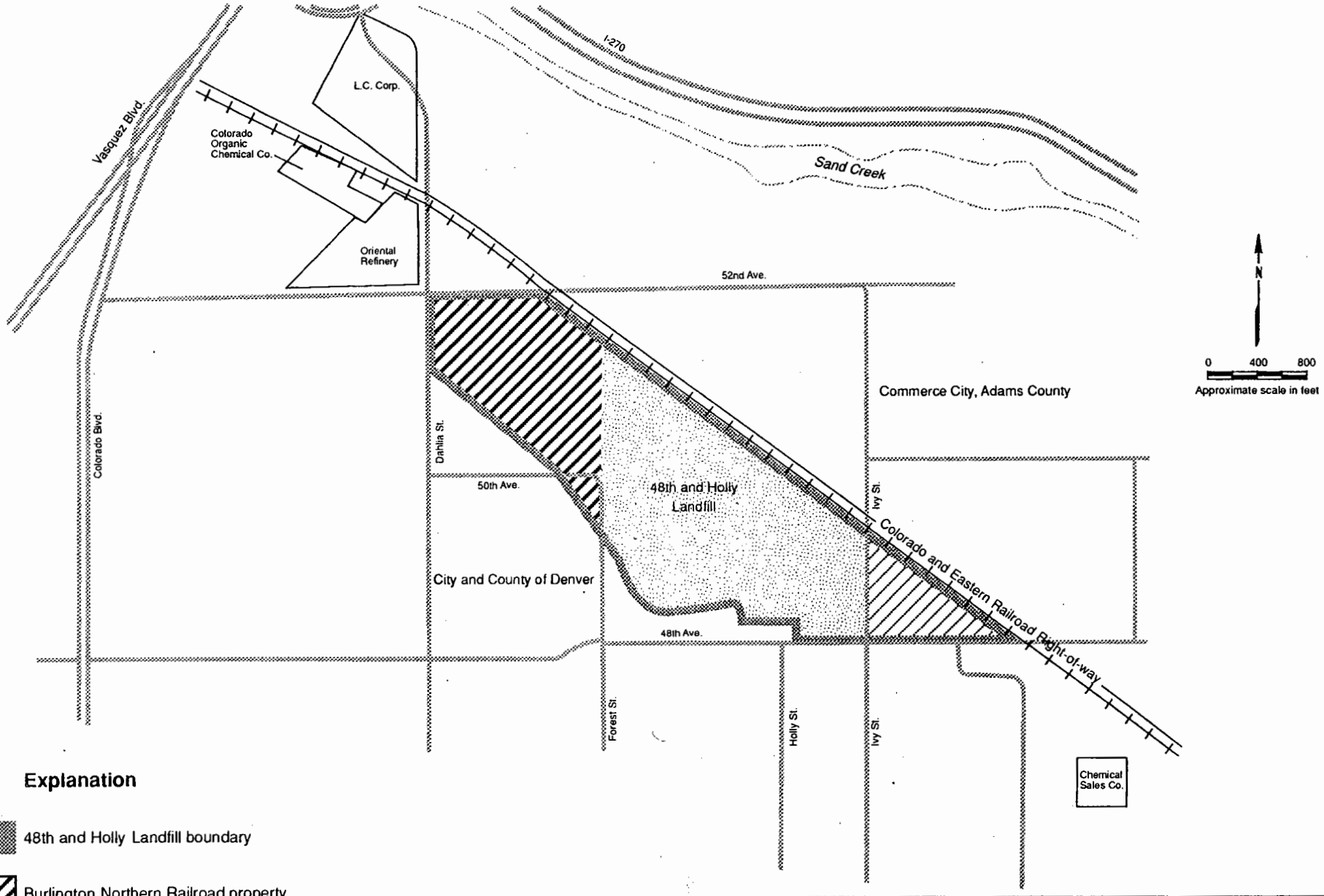
4.2.1 Access

Upon approval of this WP/RD Report by EPA, BFI of Colorado and BNR will use best efforts to negotiate and obtain site access agreements from owners of property on which wells for the groundwater monitoring program are located. These access agreements are intended to address the long-term nature of the monitoring program. Pursuant to the EPA SOW, the access agreements will provide access for EPA and its authorized representatives and will specify that BFI of Colorado and BNR are not EPA's representatives with respect to the Landfill or Landfill activities. Also, copies of the access agreements will be provided to EPA prior to initiation of field sampling activities.

4.2.2 Program Documentation Update

As part of planning activities for the groundwater monitoring program, program documentation will be reviewed and updated as described below.

48H 1161.2



Explanation

- 48th and Holly Landfill boundary
- Burlington Northern Railroad property
- Colorado Paint Company property
- Colorado and Eastern Railroad property

Harding Lawson Associates
Engineering and Environmental Services

Property Ownership
Remedial Design/Remedial Action
48th and Holly Landfill
Commerce City, Colorado

FIGURE
4.2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
LAM	27114,112		7/94	

Health and Safety Plan

Pursuant to the EPA SOW, HLA, on behalf of BFI of Colorado and BNR, will utilize the HSP developed for the Remedial Investigation/Feasibility Study (RI/FS) (HLA, 1991c) for the groundwater monitoring program. HLA will update the HSP to reflect current site conditions and applicable regulations.

Quality Assurance Project Plan

HLA, on behalf of BFI of Colorado and BNR, will perform sampling and analysis activities in conformance with the current EPA-approved QAPP, pursuant to the EPA SOW. According to correspondence to HLA dated July 21, 1994, EPA has approved the use of the QAPP developed for the RI/FS (HLA, 1991b), without modifications, for use in the RA activities.

Field Sampling Plan

Concurrent with the HSP and QAPP updates, HLA will review and update the FSP for the RI/FS (HLA, 1991a) to reflect current site conditions and specific requirements for the long-term groundwater monitoring program. The FSP, in conjunction with the HSP and QAPP, will be used to guide field personnel in performing sampling activities.

4.2.3 Water-level Measurements

Water levels will be measured during the RA activities on a semiannual basis (concurrent with the groundwater sampling events) within the wells identified in the updated FSP. Water levels in additional monitoring wells may be measured as described in Section 3.1.4.1. Water levels will be taken with an electric well sounder and will be recorded to within an accuracy of 0.01 feet.

4.2.4 Groundwater Sampling

Groundwater samples will be collected semiannually from the groundwater monitoring wells and at the groundwater discharge to surface water-location. The groundwater samples will be collected after purging of the monitoring wells. Well purging will continue until the parameters of electrical conductivity, temperature, and pH are stabilized. At least three volumes will be removed from each

well. Groundwater samples will be collected as soon as well purging is complete. If a well is pumped or bailed dry before removing three well volumes, removal of three volumes will not be required and the well will be allowed to recover sufficiently to permit sample collection. Samples will be collected as soon as possible after recharge occurs to minimize loss of VOCs. Detailed groundwater sample collection procedures will be outlined in the updated FSP.

4.3 Well Abandonment

Well abandonment will be carried out in accordance with Rule 11 "Abandonment Standards" set forth in "The Rules and Regulations for Well Construction and Pump Installation Applying to the Construction of Water Wells, Test Holes, Monitoring and Observation Wells, Dewatering Wells and the Installation of Pumping Equipment Into Such Wells" as promulgated by the State of Colorado, Office of the State Engineer (State Engineer). The following is a summary of well abandonment procedures that will be used at the Landfill.

4.3.1 Procedures

Well abandonment will involve removal of casing materials and plugging the remaining borehole. The following steps will be implemented:

1. The following measurements will be recorded on the field form:
   - Total measured depth of monitoring well
   - Depth to water
   - Casing diameter
   - Casing type
   - If feasible to obtain, length of casing, length and slot size of the screen, the interval and size of the filter pack, the intervals of grout and bentonite seals, and the length of a sump if one is present
2. Casing(s), screen, and other downhole materials (if present) will be drilled out using a mud rotary technique. The borehole will be reamed until the borehole walls are natural, in situ material. The borehole depth will be measured. The depth will be at least two feet greater than the measurement depth. The borehole should be free of debris or caved formation material. The borehole depth and diameter will be recorded on the field form.

3. The estimated grout take will be computed based on borehole depth and diameter and will be recorded in the field form.

4. Materials used for backfilling will be clean and free from contaminants. Backfill materials may include: (1) grout slurry consisting of portland type I and II cement with 5 percent powdered bentonite and mixed with tap water, distilled water, or other approved water of such quality so as not to contaminate the aquifer, or (2) bentonite pellets hydrated with water of such quality as previously described.

5. The grout will be pumped through a tremmie pipe into the borehole until the borehole is filled with grout to ground surface. The actual take of grout will be recorded on the field form.

6. After the grout has been allowed to set for at least 12 to 24 hours, the field representative will check to see if shrinkage has occurred. If so, the open borehole will be filled with additional grout so that the final level of the sealing material is flush with the ground surface.

7. A cement cap will be constructed over the decommissioned boring.

8. Final remarks will be recorded on the field form.

4.3.2 Waste Generated During Well Abandonment Activities

Waste or debris generated from well abandonment activities may include the following materials:

- Polyvinyl chloride (PVC) or steel well casing material
- PVC or steel well screen material
- Filter pack (sand, gravel, or synthetic) material
- Steel protector casing material
- Concrete pad debris

Waste or debris that may be generated during well abandonment activities are not considered hazardous waste. Information acquired during the OU 3 RI reveals that listed hazardous wastes are not present at the site. Moreover, the waste and debris cannot be expected to exhibit any of the four RCRA hazardous waste characteristics (ignitibility, corrosivity, reactivity, or toxicity). Groundwater and rinsewater generated during the OU 3 RI and during the installation of the OU 6 LFGES were analyzed for the RCRA hazardous waste characteristics and were ultimately classified as nonhazardous.

Waste generated during well abandonment activities is proposed to be disposed at a sanitary landfill as nonhazardous. Waste will be contained in accordance with applicable requirements of the sanitary landfill. Certain debris, such as steel protector casings, may be sprayed with high-pressure steam, scrubbed with detergent, and recycled or reused.

4.4 Task 6 - Five-year Reviews

It is understood that EPA will conduct five-year reviews of the Sand Creek Site beginning December 1995 and every five years thereafter. BFI of Colorado and BNR will prepare reports as described in Section 5.4 of this WP/RD Report in support of these reviews. Also, BFI of Colorado and BNR will cooperate with EPA pursuant to the EPA SOW in the performance of Task 6.

5.0 REPORTING

The EPA SOW, as clarified by EPA guidance to BFI of Colorado and BNR, identifies four types of reports, exclusive of this WP/RD report. Two types of reports, the semiannual O&M report and the five-year review report, are required long-term for documentation of O&M of the RA. Reporting requirements are described in the following sections.

5.1 Well Abandonment Report

The well abandonment report required by the State Engineer (Form No. GWS-9) with field forms attached will be concurrently submitted to EPA within 60 days after completion of well abandonment. This submittal will fulfill the requirement for a report of well abandonment as specified in the EPA SOW.

5.2 Remedial Action Completion Report

A draft Remedial Action (RA) Completion Report will be prepared and submitted to EPA within 45 days after EPA approval of this WP/RD Report. The primary guidance document for the RA Completion Report is EPA Publication 9355.0-39FS, Remedial Action Report, Documentation for Operable Unit Completion (Appendix A). A final RA Completion Report will be prepared and submitted within 30 days after EPA review of the draft version of the report.

5.3 Semiannual Operation and Maintenance Reports

O&M reports will be prepared and submitted to EPA semiannually on or before the 10th day of June and December and continuing until EPA determines that the frequency of reporting may be reduced. The reports will include, as a minimum, the following elements:

- A description of O&M activities performed during the reporting period
- A description of the performance of each component of the RA requiring O&M, including a summary of any monitoring data demonstrating the performance of the remedy and its effectiveness in meeting performance standards
- A description and summary of the results of monitoring performed in connection with the remedy

- A qualitative evaluation of the groundwater monitoring data and a conclusion as to whether the results exceed appropriate criteria, and whether any exceedances necessitate the implementation of contingency measures
- Identification of any problems or potential problems and a description of steps taken or needed to rectify the problems
- An appendix containing validated Form I's or forms with a similar format for groundwater samples collected during the reporting period and not previously submitted
- Groundwater monitoring data in a format suitable for input into the Sand Creek Groundwater Database

5.4 Five-year Review Reports

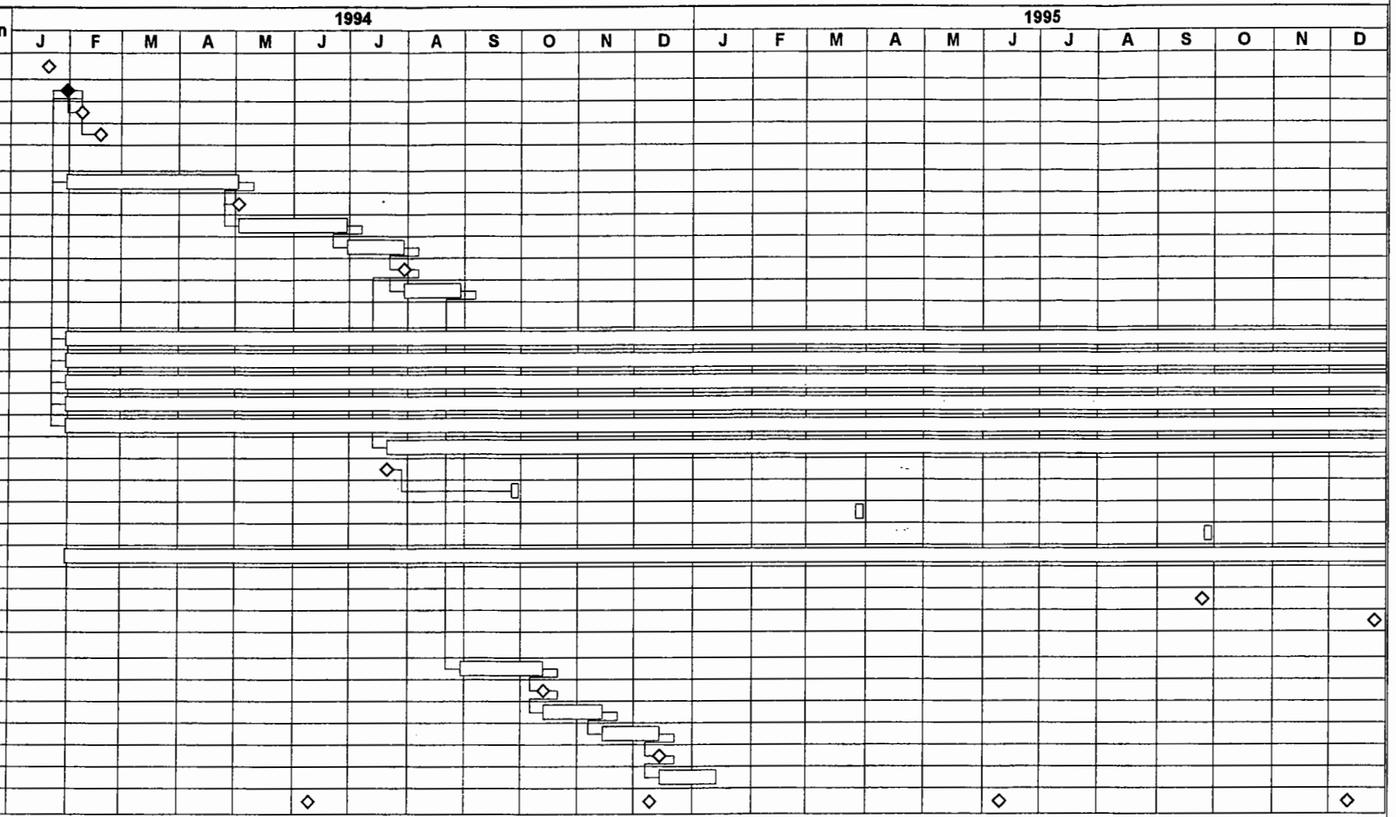
A report in support of five-year site reviews will be prepared and submitted to EPA on or before September 25, 1995, and on the same date every five years thereafter until completion of the obligations under the UAO for RD/RA. The report will include a summary of remedial activities performed pursuant to the EPA SOW, an interpretation of monitoring data, and an evaluation of the effectiveness of the remedy.

6.0 SCHEDULE

A proposed schedule for the activities associated with the RD/RA is presented in Figure 6.1. Ongoing activities are included in the schedule for completeness. EPA reviews and approvals are also included in this schedule. Because of the interdependency of activities, delays relative to these reviews and approvals will necessitate a day-for-day extension of subsequent milestones.

REMEDIAL DESIGN/REMEDIAL ACTION (THROUGH 1995)

Task Name	Sched Start	Sched Fin
UAO Approved	**01/21/94**	**01/21/94**
UAO Effective	01/31/94	01/31/94
Respondents' Identification of Staff	02/08/94	02/08/94
Respondents' Notice of Intent to Comply	02/18/94	02/18/94
Work Plan/Remedial Design (WP/RD)	**01/31/94**	**08/29/94**
Prepare Draft WP/RD	01/31/94	05/02/94
Submit Draft WP/RD	05/02/94	05/02/94
EPA Review of Draft WP/RD	05/03/94	06/29/94
Prepare Final WP/RD	06/30/94	07/29/94
Submit Final WP/RD	07/29/94	07/29/94
EPA Approval of Final WP/RD	07/30/94	08/29/94
Remedial Action/O&M *	**01/31/94**	**01/01/96**
Task 1 - Continue O&M of LFGES #	01/31/94	01/01/96
Task 2 - Continue O&M of Cover System #	01/31/94	01/01/96
Task 3 - Continue Maintenance of Fence #	01/31/94	01/01/96
Task 4 - Implement Monitoring Program	01/31/94	01/01/96
Landfill Gas #	01/31/94	01/01/96
Groundwater	07/21/94	01/01/96
EPA Approval of QAPP	07/21/94	07/21/94
Groundwater Monitoring Event #1	09/26/94	09/29/94
Groundwater Monitoring Event #2	03/27/95	03/30/95
Groundwater Monitoring Event #3	09/26/95	09/29/95
Task 5 - Institutional Controls #	01/31/94	01/01/96
Task 6 - Five-Year Reviews *	09/25/95	12/25/95
Report	09/25/95	09/25/95
Review	12/25/95	12/25/95
Remedial Action (RA) Completion Report	**08/29/94**	**01/13/95**
Prepare Draft RA Completion Report	08/30/94	10/13/94
Submit Draft RA Completion Report	10/13/94	10/13/94
EPA Review of Draft RA Completion Rpt	10/14/94	11/14/94
Prepare Final RA Completion Report	11/15/94	12/14/94
Submit Final RA Completion Report	12/14/94	12/14/94
EPA Approval of Final RA Completion Rpt	12/15/94	01/13/95
Semi-Annual O&M Reports *	**06/10/94**	**12/11/95**



* Activities continue past 01/01/96, the extent of this schedule.

Remedial activities already implemented.

Explanation

EPA U.S. Environmental Protection Agency
LFGES Landfill Gas-extraction System
O&M Operation and Maintenance
QAPP Quality Assurance Project Plan
UAO Unilateral Administrative Order

Harding Lawson Associates
Engineering and
Environmental Services

Project Schedule
Remedial Design/Remedial Action
48th & Holly Landfill
Commerce City, Colorado

FIGURE
6.1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
NLM	27114,112		7/94	

7.0 COST SUMMARY

The summary of estimated costs for components of the remedy to be implemented is presented in Table 7.1. The summary includes both estimated capital and annual O&M costs associated with the components of the remedy as described in Section 4.0 of this report.

Table 7.1 Summary of Estimated Costs

Estimated Capital Costs	
Well abandonment	$3,000
Additional institutional controls, as necessary	NE
Estimated Annual Operation and Maintenance (O&M) Costs*	
Landfill gas-extraction system#	152,000
Groundwater monitoring program	72,000
Five-year reviews	11,400

NE Not estimated because of uncertainties in costs associated with negotiating and implementing additional institutional controls, as necessary.

* Actual O&M costs will vary depending on particular site conditions; however, these costs are anticipated to decrease over time.

\# Includes costs for landfill gas monitoring, fence maintenance, and soil cover system maintenance.

8.0 ACRONYMS

µg/l	Micrograms per liter
1,1-DCE	1,1-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
1,2-DCE	1,2-dichloroethene
AOC	Administrative Order on Consent
BFI of Colorado	Browning-Ferris Industries of Colorado, Inc.
BNR	Burlington Northern Railroad
CCD	City and County of Denver
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
CSC	Chemical Sales Company
cy	Cubic yard
EE/CA	Engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
ES	Engineering-Science, Inc.
FSP	Field sampling plan
HDPE	High-density polyethylene
HLA	Harding Lawson Associates
HSP	Health and Safety Plan
KRW	KRW Consulting, Inc.
Landfill	48th and Holly Landfill
LFGES	Landfill gas-extraction system
NCP	National Contingency Plan
O&M	Operation and maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable unit

OU 3 RI	Operable Unit 3 Remedial Investigation
PCE	Tetrachloroethene
PMHS	Parcel, Mauro, Hultin & Spaanstra, P.C.
ppm	Parts per million
PVC	Polyvinyl chloride
QAPP	Quality assurance project plan
QA/QC	Quality assurance/quality control
RA	Remedial action
RD/RA	Remedial design/remedial action
RI	Remedial investigation
RI/FS	Remedial investigation and feasibility study
ROD	Record of Decision
Sand Creek Site	Sand Creek Industrial Superfund Site
SARA	Superfund Amendments and Reauthorization Act
SOW	Statement of Work
SVOC	Semivolatile organic compound
TCE	Trichloroethene
UAO	Unilateral Administrative Order
URS	URS Consultants, Inc.
VOC	Volatile organic compound
WP/RD	Work plan/remedial design

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Appendix A

U.S. ENVIRONMENTAL PROTECTION AGENCY PUBLICATION 9355.0-39FS, REMEDIAL ACTION REPORT, DOCUMENTATION FOR OPERABLE UNIT COMPLETION

United States Environmental Protection Agency | Office of Solid Waste and Emergency Response | Publication 9355.0-39FS June 1992

EPA

Remedial Action Report

Documentation for Operable Unit Completion

Office of Emergency and Remedial Response
Hazardous Site Control Division OS - 220W

Quick Reference Fact Sheet

The progress in moving a site toward the ultimate goal of deletion from the NPL typically involves several operable units or multiple phases of construction over a period of several years. The purpose of the Remedial Action Report is to document the activities that occur under each specific remedial action operable unit at a site. This report provides documentation that a particular operable unit has met its objectives as well as summary information for subsequent inclusion in the Superfund Site Close Out Report. The report also serves as an excellent source of lessons learned for project managers and designers of future remedial action projects.

The Environmental Protection Agency's (EPA) Superfund Comprehensive Accomplishments Plan (SCAP) and Strategic Targeted Activities for Results System (STARS) define completion of an operable unit remedial action as: conclusion of construction activities, performance of a final inspection, determination that the remedy is operational and functional, and preparation of an operable unit Remedial Action Report. Acceptance of the Remedial Action Report by the Regional Superfund Branch Chief, demonstrates the formal completion of the operable unit remedial action and completes the requirements for meeting the target.

Figure 1: Remedial Action Report Elements

- Introduction
- Chronology of Events
- Performance Standards and Construction Quality Control
- Construction Activities
- Final Inspection
- Certification that Remedy is Operational and Functional
- Operation and Maintenance
- Summary of Project Costs

CONTENT OF THE REPORT

Figure 1 highlights the essential elements that should be included in the Remedial Action Report.

Introduction

This section provides a short (approximately 1 page) general description of the site and remedy implemented. Site location and description, history, components of the selected remedy, and specific contaminants dealt with during the remedial action are examples of items to address. Sufficient information should be provided to permit a reader unfamiliar with the site to understand the challenges faced by those involved in the remedial action.

Chronology of Events

This section provides a summary of the major events associated with the remedial action. A suggested starting point is the Regional Administrator's signature on the Record of Decision or the date the remedial design assignment was issued.

Performance Standards and Construction Quality Control

This is probably the most important section of the Remedial Action Report. Performance Standards are the criteria or requirements that the remedial action contractor met in completing the project. Performance Standards include cleanup levels, quality criteria, and other substantive requirements, or limitations found in the Record of Decision. Each Performance Standard should be addressed by providing the standard, the maximum level permissible, the results of field sampling, the basis for the determination that the standard was met (except for Long Term Remedial Actions), and the location and frequency of the tests.

This section of the Remedial Action Report should also provide a summary of the implementation of the construction quality control plan and provide an assurance that the remedial action is complete. A table should be included that lists the types of samples taken and provides a comparison of test results with the specified standards to be achieved by the remedial action.

Construction Activities

This section is a narrative description of the construction activities undertaken for the remedial action. Quantities excavated, cleanup levels achieved, and materials and/or equipment used should be addressed in this section and may be presented in tabular format in support of the narrative. The name and specific role of the major design and remedial action contractors should be provided. Participation by other federal agencies such as the U.S. Army Corps of Engineers or the U.S. Bureau of Reclamation should be discussed.

This is also the section where information on "l sons learned" should be provided. While a ma portion of this narrative will deal with proble encountered during the construction, succes should be documented as well. Included in discussion of problems should be the options c sidered, the process used to select a final solutic and the causes of any delays encountered. T discussion of successes should include time or c saving measures employed or the use of innovati solutions to problems encountered.

Final Inspection

This section documents the pre-final and final i spections conducted by the contracting party a contractor at the completion of construction of operable unit. The section should contain a bri description of the deficient construction items (pun list) reported and resolved during the pre-final a final inspections and a list of attendees at t inspection(s). The final resolution of all deficie items should be documented.

Certification that Remedy is Operational and Functional

For those operable units where the Remedial Actic includes a shakedown period (e.g., operation of system for the treatment of leachate or ground w ter), the Remedial Action Report should include statement that the work was performed within d sired specifications and that the remedy is oper tional and functional. For other operable units (e.g the excavation and off-site disposal of contaminat soil) the certification will be an affirmation th performance standards have been met. The basis f the determination should also be provided.

Operation and Maintenance

An operation and maintenance plan is required f virtually all remedial actions. This section shou discuss the highlights of the operation and maint nance plan, as well as provide insight to potenti problems/concerns.

Summary of Project Costs

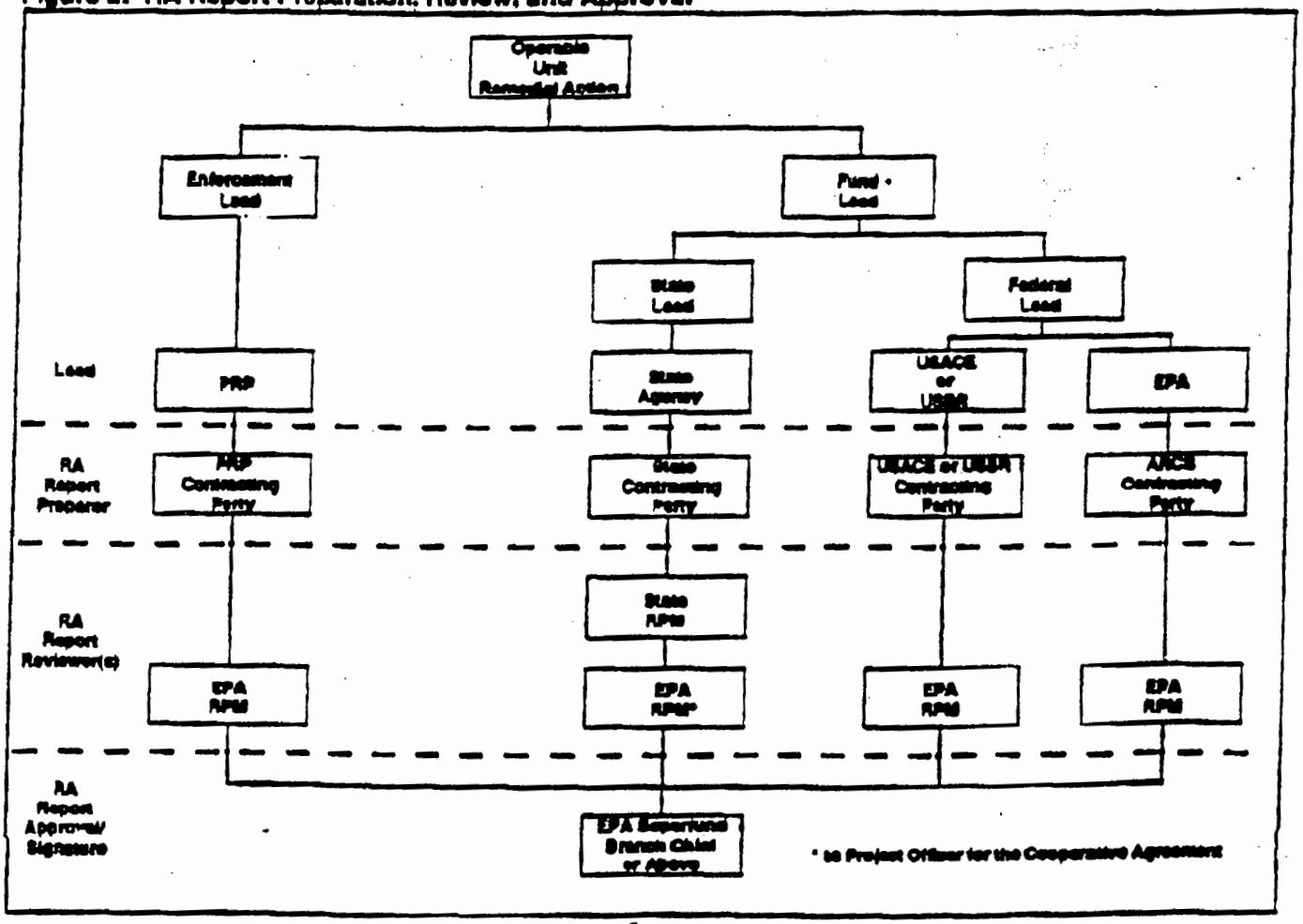
This section should provide the final costs for the project and compare them to the original remedial action estimate. It is required for fund-lead projects and provided whenever possible for Potentially Responsible Party lead projects. Presentation of this information may be in tabular or narrative form. The need for and cost of any modifications during construction should be noted in this section. If the project was performed by PRPs, a summary of the EPA oversight costs should also be appended to the report.

PREPARATION OF THE REPORT

The Remedial Action Report should be prepared by someone familiar with both the design and construction efforts associated with the remedial action. This familiarity provides the best background to discuss the successes and difficulties of the project. This knowledge is often limited to just two parties: the EPA Remedial Project Manager (RPM) and the contracting party for the remedial action (e.g., the PRPs, the U.S. Army Corps of Engineers, the State, or EPA's ARCS contractor). In either case, the contracting party has had a major role in the implementation of the project. While the EPA RPM can and sometimes may prepare the Remedial Action Report, it is recommended that the contracting party be tasked to prepare the report as part of the work assignment, IAG, or settlement agreement.

Figure 2 is a flow diagram showing the individuals typically responsible for preparation, review, and approval of the Remedial Action Report under the several possible scenarios. For most operable units the Remedial Action Report should be prepared within sixty days of the Final Inspection of the completed construction. However, for systems requiring a shakedown period, the report should be drafted at the completion of construction and final-

Figure 2: RA Report Preparation, Review, and Approval



ized within sixty days of the determination that the system is operational and functional. The recommended maximum report length is twenty (20) pages. The Remedial Action Report should be signed and dated by the preparer and submitted to the EPA RPM for review and comment. Formal completion of the Remedial Action as well as the Remedial Action Report occurs with the approval of the report by the Regional Superfund Branch Chief.

A Remedial Action Report should be prepared following each operable unit remedial action. When there is more than one operable unit at a site, a Site Close Out Report (Preliminary, Interim or Final) should be prepared following the successful implementation of the final operable unit remedial action. Only one Site Close Out Report should be prepared for the entire site, regardless of the number of operable units. The Remedial Action Reports for the individual operable units should be used as the basis for development of the Site Close Out Report. The preparation of Site Close Out Reports is covered in Procedures for Completion and Deletion of National Priorities List Sites, EPA/540/G-89/002, dated April, 1989 and subsequent updates.

For additional information on Remedial Action Report preparation please contact:

Office of Emergency and Remedial Response
Hazardous Site Control Division
Design and Construction Management Branch* (OS-220W)
(703) 308-8393

* Call your RD/RA Regional Coordinator

EPA

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Appendix B

RESPONSES TO COMMENTS

RESPONSES TO U.S. ENVIRONMENTAL PROTECTION AGENCY AND COLORADO DEPARTMENT OF HEALTH COMMENTS REGARDING THE DRAFT WORK PLAN/REMEDIAL DESIGN REPORT FOR THE 48TH AND HOLLY LANDFILL (SAND CREEK INDUSTRIAL SUPERFUND SITE) OPERABLE UNITS 3 AND 6

GENERAL COMMENTS

Comment A

Unfiltered metals samples must be collected and should be used for statistical purposes, unless the PRP can demonstrate that filtered samples should be used. We have national risk assessment guidance (RAGs) that tells us to use unfiltered samples. The use of low-flow sampling to minimize turbidity should be considered.

Response

The main concern with unfiltered (total) metals samples is the potential for well sediment to be introduced into the groundwater sample. The presence of sediment in a sample could be erratic, causing fluctuations in the reported metals concentrations that are not truly representative of groundwater conditions. The extended inactivity of the monitoring wells selected for sampling will probably exaggerate this initially. Low-flow sampling is being considered and will help to minimize this problem, but it cannot eliminate the possibility of sediment entering the metals samples and causing erratic data.

Historically for Operable Unit (OU) 3, filtered (dissolved) metals samples have been collected and analyzed in accordance with the approved Final Sampling Plan (field sampling plan [FSP]) and the Final Quality Assurance Project Plan (QAPP) and used as the basis for a remedial investigation report and a risk assessment. Dissolved metals samples should continue to be collected and analyzed for consistency with the historical data to: (1) allow for appropriate semiannual evaluation of temporal changes, if any, in groundwater in the vicinity of the 48th and Holly Landfill (the Landfill) and (2) to ultimately provide the basis for an appropriate interpretation of the groundwater monitoring data in support of the five-year reviews. The intent of the proposed sampling program is long-term monitoring of target analyte concentrations in groundwater in the vicinity of the 48th and Holly Landfill. A statistical analysis of the groundwater data will not be performed in accordance with U.S. Environmental Protection Agency (EPA) direction. Therefore, it is the joint opinion of Browning-Ferris Industries of Colorado, Inc. (BFI of Colorado), and Burlington Northern Railroad (BNR) that dissolved metals samples are appropriate and adequate for the monitoring program as designed.

SPECIFIC COMMENTS

Comment No. 1, page 2-1, Section 2.0

The first set of bullets should include monitoring of ground water to ensure no off-site migration of site related contaminants as an additional purpose of the RD/RA program.

Response

The purpose of the remedial design/remedial action (RD/RA) program is written directly as cited in the Record of Decision (ROD) for OUs 3 and 6. Therefore, no text revision is recommended.

The last bullet on the page which calls for the development of the well abandonment plan should include a description of well maintenance as well.

Response

Well maintenance activities have been added as a component of the groundwater monitoring program as described in Section 3.1.7.

Comment No. 2, page 3-2, second complete paragraph

In the sentence "Where present, Aquifer 2 overlies bedrock of fine-grained...", the word "of" should be changed to "or".

Response

The text has been revised accordingly.

Comment No. 3, Figure 3.2

The potentiometric surface map of Aquifer 0, and Figure 3.3, the potentiometric surface map of Aquifer 2, should show the locations and water level data used to prepare the maps. This format without the water level data is contained in Figures 3.10 and 3.19 of the 1992 Revised Final Remedial Investigation Summary Report for Operable Unit 3 prepared by HLA.

Response

Figures 3.2 and 3.3 are essentially reprints of maps previously developed for the OU 3 Remedial Investigation (RI) Report and are provided here for convenience in reviewing the established hydrogeologic conceptual model. Potentiometric surface maps developed in the future will be formatted to include well locations and water-level data. (See Response to Comment No. 14.)

Comment No. 4, page 3-3, Section 3.1.4

This section discusses a field reconnaissance of wells before the monitoring program is finalized. State that additional wells may be needed if the chosen wells cannot be used for some reason.

Response

The text as written states, "If the current conditions of any monitoring location are found to be unsuitable for long-term monitoring, a replacement well will be identified."

page 3-3, last full paragraph, last sentence (Section 3.1.4, Data Collection)

How will replacement wells be identified?

Response

If required, an existing well will be considered as an appropriate replacement based on current classification (Aquifer 0/Aquifer 2; upgradient/downgradient) and subsequent field evaluation of the well for suitability to long-term monitoring.

Comment No. 5, page 3-3, last paragraph

and all other repeated references throughout the document: The sampling plan should be referred to as the field sampling plan (FSP) so it can not be confused with the more encompassing CERCLA term sampling and analysis plan (SAP) (40 CFR 300.430(b)(8)).

Response

The existing sampling plan for the OU 3 RI that will be updated for the RD/RA activities is the final Sampling Plan for the 48th and Holly Landfill (Harding Lawson Associates [HLA], 1991). Rather than use the abbreviation "SP," the abbreviation "FSP" has been established in the text to accommodate this comment.

Comment No. 6, page 3-4, second full paragraph (Section 3.1.4.1 Water-level Measurements)

also the sentence at the bottom of page 3-5 and the top of page 3-6 (first sentence of first paragraph of Section 3.1.5.1, Analysis of Water-level Data): From which additional "selected existing monitoring wells" will water level measurements be taken? Specify the "appropriate frequency" for taking these additional water level measurements. (This information is to be specified in the updated FSP.)

Response

The additional water-level measurements referred to in the text are anticipated to be collected upgradient of the Landfill and downgradient of the Chemical Sales Company (CSC) Superfund Site. As stated in the text, the purpose is to "evaluate whether the groundwater flow patterns beneath the Landfill are affected by pumping or other activities that may be occurring during remediation of the CSC site." At the July 14, 1994, project meeting regarding the draft Work Plan/Remedial Design Report (WP/RD), EPA concurred that, at this time, it is premature to identify specific wells and monitoring frequencies for the above-stated purpose. As the design for the CSC remedy and plans for its operation and upgradient pumping are finalized, BFI of Colorado and BNR will coordinate with EPA regarding additional water-level monitoring.

Comment No. 7, Page 3-4 (Section 3.1.4.2, Groundwater Sampling and Chemical Analysis)

The dates for the semiannual sampling should be specified and the rationale for their selection should be given.

Response

A schedule, as required by the Unilateral Administrative Order (UAO), is provided in Section 6.0.

Comment No. 8, page 3-4, last paragraph, last sentence (Section 3.1.4.2, Groundwater Sampling and Chemical Analysis)

Specify techniques to be used for sample container cleaning and preparation (e.g., SW-846 Chapters 3 and 4, "Standard Methods" Part 1070; etc.), or reference the QAPjP or FSP as appropriate.

Response

The sentence has been revised to include a reference to Section 5.3 of the QAPP that discusses bottle cleaning requirements.

Comment No. 9, page 3-5, first paragraph, and Table 3.2 (Section 3.1.4.2, Groundwater Sampling and Chemical Analysis)

The proposed analytical parameters consist of the identified chemicals of concern (COCs) for groundwater, as identified in the RI and the ROD, plus total dissolved solids (presumably included as a general groundwater quality indicator parameter). The groundwater COCs are appropriate as a minimal analyte list.

Response

No response is required.

Comment No. 10, Table 3.3, Analytical Methods (Section 3.1.4.2, Groundwater Sampling and Chemical Analysis)

SW-846 methods are proposed for analysis of organics and metals. The existing QAPjP and FSP specify the CLP SOW methods for these parameters. This change in analytical methods can impact data comparability (e.g., due to differences in QC requirements). Worse, the detection and quantitation limits for organics by the SW-846 methods are approximately five times higher than by the CLP methods. Since many of the historical detects of these analytes in the proposed monitoring wells were at levels near the CLP quantitation limits, the use of less sensitive analytical methods can be expected to result in a large proportion of qualified data (estimated concentrations) and false negatives (analytes reported as not detected by the SW-846 methods which would have been detected by the CLP methods). HLA must present a compelling argument for proposing the use of different (especially less sensitive) analytical methods, and the issue of comparability must be addressed. If modifications to the SW-846 methods are contemplated, in order to provide better sensitivity (e.g., use of larger purge volumes for VOAs, or more concentrated extracts for SVOAs), these modifications must specified.

In view of the possibility that the proposed analytical program may not detect migration of non-COC contaminants from the landfill (see Specific Comment No. 8), it is recommended that consideration be given to selecting alternative analytical methods. For example, if SW-846 methods must be used, Methods 8010 and 8020 will detect all of the OU3 COCs, as well as many of the potential contaminants found in well C-4 and in the LFGES condensate. Methods 8010/8020 also provide lower detection/quantitation limits for VOAs than does Method 8260. Naphthalene may be detected by Method 8310 at the same, or better, sensitivity obtainable by Method 8270 and by the CLP SOW for multimedia - multiconcentration organics. However, the GC/MS methods for organics should be used if non-target peaks are to be tentatively identified.

Response

The main reason that SW-846 methods were proposed was to maximize the number of analytical laboratories that could perform the requisite analyses, and thereby minimize the associated analytical costs through competition. Using SW-846 methods would not negatively impact comparability with previous results because the same methods of instrumental analysis would continue to be used, e.g., volatile organic compounds (VOCs) would continue to be analyzed by purge-and-trap gas chromatography/mass spectrometry (GC/MS).

The proposed SW-846 methods do not have reporting limits that are five times the corresponding Contract Laboratory Program (CLP) method detection limits. Method 8260 includes provisions for analysis of 25-milliliter water sample volumes that will provide reporting limits (see Method 8260 Table 3) comparable to the CLP low-level water method using the same analytical mechanism. No modification to Method 8260 would be required because this variation is written into the method. Moreover, the reporting limits for the proposed SW-846 semivolatile organic compound (SVOC) and metals methods are the same as those for the comparable CLP methods. In short, the SW-846 methods that were proposed have the same reporting limits as those that have been historically obtained on this project and as those that would be obtained using comparable CLP methods. Analytical sensitivity would not be sacrificed by using the proposed SW-846 methods.

BFI of Colorado and BNR believe that the analytical methods proposed in the draft WP/RD Report provide satisfactory comparability and sensitivity with respect to historical data and that the proposed methods are adequate for data needs. However, in light of the concerns about data comparability and to maintain analytical consistency, the methods of analysis have been changed from SW-846 to CLP.

Comment No. 11, Table 3.3, Analytical Methods (Section 3.1.4.2, Groundwater Sampling and Chemical Analysis)

Specify the extraction method to be used for SVOAs and the digestion method to be used for metals.

Response

Sample preparation will be in accordance with CLP protocol. (See Response to Comment No. 10.)

Comment No. 12, page 3-5, second paragraph, first sentence (Section 3.1.4.2, Groundwater Sampling and Chemical Analysis)

Specify the "method-specific QA/QC procedures" to be performed. SW-846 methods do not specify comprehensive QC requirements. Both field and laboratory QA/QC must be described in detail in the updated QAPjP.

Response

Quality assurance/quality control (QA/QC) will be performed in accordance with CLP protocol. (See Response to Comment No. 10.)

Comment No. 13, page 3-5, second paragraph, second sentence (Section 3.1.4.2, Groundwater Sampling and Chemical Analysis)

It is stated that documentation will be provided "to allow for data validation." Does this mean that all data will be validated, or that some data may be validated? What guidelines or procedures will be used to validate data? Who will validate the data? How will the use of qualified data impact the statistical analyses?

Response

Section 9.2 of the QAPP presents the data validation approach that will be used for this project. Briefly, this approach indicates that 100 percent of the analytical lots will be validated in accordance with the Functional Guidelines. The text has been revised to include a reference to the QAPP. Statistical analyses of data will not be performed; therefore, the concern regarding qualified data is obviated.

Third and fourth sentences (Section 3.1.4.2, Groundwater Sampling and Chemical Analysis)

In the context of documentation to be provided, what does the phrase "whenever applicable" mean? All of the documentation mentioned is required in order for data validation to be performed. In addition, metals data should include post-digestion spike results; ICP/AES data should include results from serial dilution and interference check samples; and AAS data should include method of standard additions (MSA) results.

The data will be provided in a computer readable format which is agreed upon with EPA. The data will also be plotted on plan view maps, contoured if appropriate and provided in tables. This data includes chemical quality and water level data." (Erna, you may want to add other data in here--landfill gas results, etc.)

Response

The reference to "whenever applicable" means that whenever the information listed in Section 3.1.4.2 is appropriate for a given analytical lot, this information will be included in the final lot data package. Generally, nearly all of the listed data items will need to be included in each lot data package. The primary exceptions will be data for duplicate samples and matrix spike/matrix spike duplicate samples because these samples will not necessarily be included in each analytical lot. Additionally, the list of data presented in Section 3.1.4.2 was not intended to be an exhaustive itemization of every piece of data required in a data package but, rather it was a summary of the types of data expected. The data packages will be CLP-type data packages as directed in Section 9.2.2 of the QAPP and will include the metals QC data in question.

The data will be provided in a format suitable for input into the Sand Creek Groundwater Database, as specified in the UAO and in Section 5.3 of the WP/RD Report. As discussed at the July 14, 1994, project meeting regarding the draft WP/RD Report, this format will be coordinated with EPA at the

time of the first monitoring event. Evaluation of data will be in accordance with Section 3.1.5 of the WP/RD Report.

Comment No. 14, page 3-5, Section 3.1.5.1

State that the water level data will be plotted next to each well, in addition to any contouring of the data.

Response

The text has been revised accordingly.

Comment No. 15, page 3-6, first paragraph

The word "review" in the sentence "Water-table maps..." should be changed to "determine and/or conform."

Response

The water-table maps provide a representation of site conditions at a particular point in time. The text has been revised for clarification as follows: "...and to assess any temporal changes in the groundwater flow directions and hydraulic gradient direction and magnitude."

page 3-6, Section 3.1.5.2

Throughout this section about the analysis of chemical data, the desire is expressed to reduce the probability of false positives (type I error). There is no mention, however, of the effect on the rate of false negatives (type II error). When the false positive rate is reduced, the false negative rate is generally increased. While reducing the false positive rate protects the facility operator or owner, it provides a lesser extent of protection for human health and the environment, since actual significant differences in downgradient wells may not be indicated when, in fact, they have occurred.

The idea of substituting PCE, TCE and benzene as representative compounds is not supported. These are not particularly important to the landfill, but TCE and PCE are definitely related to the Chem Sales plume.

Response

EPA has requested that the statistical evaluation of groundwater monitoring data be replaced with a qualitative evaluation. Section 3.1.5.2 has been revised accordingly.

page 3-7, Section 3.1.5.2

At the bottom of the page, three parameters are selected for use in statistical analysis: tetrachloroethylene (PCE), benzene and arsenic. These three are chosen to represent the 22 parameters listed in Table 3.2, and are stated to be representative of the chemicals of concern identified during the OU 3 Remedial Investigation/Risk Assessment process. These three parameters do not adequately represent over 20 total compounds. Benzene and arsenic may be representative since they are both fairly mobile. Selection of PCE, however, is confusing. The reason given is because it is a parent compound instead

of a breakdown product. The use of a breakdown product such as vinyl chloride may indeed be seen to increase in concentration from upgradient to downgradient due to the degradation of the chlorinated organic compounds. However, the concentration of PCE may decrease from upgradient to downgradient due to the same process. Vinyl Chloride is more toxic and more mobile and is a better selection than PCE.

Response

See response to Comment No. 15, page 3-6, Section 3.1.5.2, regarding the statistical evaluation.

Section 3.1.6

State that all data will be provided to EPA on a semi-annual basis, and the approximate date that the reports will be submitted.

Response

Reporting requirements are described in Section 5.0.

Comment No. 16, pages 3-6 through 3-10, Figure 3.5, and Table 3.4 (Section 3.1.5.2, Analysis of Chemical Data)

This entire section needs to be rewritten. On page 3-7, first paragraph, second sentence states that the guidance specifies a maximum false positive rate (Type I error) of 1% for individual comparisons and 5% for multiple comparisons. In fact, the RCRA guidance sets these error rates as minimum levels, in order to reduce the probability of false negatives (Type II errors); the guidance sets no upper limit on Type I error rates, but merely permits the use of multiple comparisons in order to reduce these errors.

The proposed use of combined Shewhart-CUSUM control charts is inappropriate; the RCRA guidance recommends the use of control charts for intra-well comparisons from uncontaminated wells only. It is clear that neither the upgradient nor the downgradient wells are "uncontaminated." Furthermore, the proposed tolerance limits for downgradient wells, shown in Table 3.4 of the draft RD report, were calculated from parameter concentrations found in upgradient wells. This is not an "intra-well" comparison. Section 5 of the RCRA guidance outlines the preferred methods for statistical comparisons between background (upgradient) and compliance (downgradient) wells.

Since the upgradient wells show evidence of contamination from other sources, the use of upgradient well data to calculate tolerance limits results in very high tolerance limits for the wells downgradient from the landfill. For example, the Aquifer 0 background well FIT-MW3 is within the plume of contamination by chlorinated solvents originating at the Chemical Sales Co. site. A release of PCE solely from the landfill could not possibly result in downgradient concentrations which exceed the proposed PCE tolerance limit of almost 4000 µg/L.

HLA's proposal to use arsenic, benzene, and PCE as "target parameters" for statistical comparisons, rather than analyzing the full complement of target analytes, is unacceptable. The use of only three target parameters is proposed as a means of reducing the experiment-wise Type I error probability. However, as indicated above and in the RCRA guidance, Type I errors should be considered less undesirable than Type II errors, because Type II errors represent undetected contaminant migration. Since Type II error probabilities depend upon the sample size, as well as the specified acceptable Type I error probability, reducing the number of comparisons to be made by limiting the comparisons to

three constituents will reduce the power (i.e., increase the Type II error probability) of the statistical tests.

Additionally, the use of PCE as a target parameter representative of the other chlorinated COCs essentially amounts to pooling the data for all such contaminants into a single comparison. (It is functionally equivalent to treating the results for the other COCs as missing data, and distributing the residual errors equally among all the analytes.) As stated in the draft RD report, this practice will reduce the experimentwise Type I error probability. However, the RCRA statistical guidance (page A-7) specifically prohibits the use of an experimentwise significance level for comparisons among different chemical constituents; each monitored constituent must be treated separately.

Table 3.4 of the draft RD report is confusing. HLA must propose an acceptable data evaluation plan which: (1) compares downgradient concentrations of each analyte in each aquifer to the appropriate upgradient concentrations; (2) utilizes robust parametric or non-parametric analyses appropriately for each analyte, based on the frequency of detection and distribution of concentrations (normal, log-normal, or non-normal) for each analyte; (3) precisely defines the hypotheses to be tested and the statistical test used; and (4) is sufficiently powerful to propose null and alternative hypotheses which will minimize the probability of Type II errors while controlling Type I errors to a reasonable (not maximum) rate. Such a plan must be described in sufficient detail to allow adequate evaluation by a qualified outside reviewer. Since the Main purpose of the groundwater monitoring is to detect changes in groundwater quality downgradient of the landfill due to the release of constituents from the landfill, statistical evaluation (using one-sided tests) of the data should be concerned with detecting significant increases in downgradient contaminant concentrations.

Response

See response to Comment No. 15 page 3-6, Section 3.1.5.2, regarding the statistical evaluation.

Comment No. 17, page 3-8, Section 3.1.5.2

Historical data on the existing wells needs to be used to prepare control charts. The way it is described, two years of monitoring will be accomplished before any analysis is done to compare upgradient and downgradient wells. Without the use of historical data, any migration of contaminants for the first two years will not be detected.

Response

See response to Comment No. 15, page 3-6, Section 3.1.5.2, regarding the statistical evaluation.

Comment No. 18, pages 3-9 and 3-10, Section 3.1.5.2

There are only three wells proposed for use as upgradient, or background wells, in the ground water monitoring plan: SC-2B, L-2, and FIT-MW3. L-2 and FIT-MW3 are in Aquifer 0, and SC-2B is in Aquifer 2. Tolerance limits were calculated for the three indicator parameters selected for analytical comparison based on the use of data from seven wells, including four which are not proposed for use in the monitoring plan. The use of data from wells not used in the monitoring plan to calculate tolerance limits for analytical significance is inappropriate. In addition, it is inappropriate to compare down-gradient wells in one aquifer to upgradient wells in another aquifer.

Response

See response to Comment No. 15, page 3-6, Section 3.1.5.2, regarding the statistical evaluation.

Comment No. 19, pages 3-10 and 3-11 (Section 3.1.6, Data Management)

Where will working and backup copies of the database be kept? How will access be restricted? Who are the "authorized personnel" to whom access will be restricted?

Response

Working and backup copies of the database will be kept by BFI of Colorado's and BNR's technical consultants. Access will be restricted to authorized project team personnel (e.g., the project chemist) and by designating read/write access to the database as appropriate.

Comment No. 20, page 3-11, Section 3.1.6

What is the procedure and schedule for reporting analytical data to EPA and CDH?

Response

Reporting requirements are described in Section 5.0.

page 3-11 (Section 3.2, Well Abandonment Plan)

The statement "water quality results reflect direct impact from the Landfill and do not represent water quality in Aquifer 0 beneath the Landfill" is both true of the former and false for the latter. The water quality data for samples taken from monitoring well C-4 do indicate that the groundwater in Aquifer 0 beneath the Landfill has been affected by contaminant releases from the Landfill by way of well C-4 or through the base of the Landfill itself. In addition, these data now are representative of the groundwater quality in Aquifer 0 which has become contaminated via one or both of these pathways.

Monitoring well C-4 is not the only well that should be abandoned. There are ten wells downgradient of the Landfill that should be abandoned as part of the RD/RA activities because they will not be included in the monitoring programs for OU3/6 and OU4. These groundwater monitoring wells are listed in Table 1 along with the aquifer in which they are installed and the type of casing they contain.

Table 1
Monitoring Wells Proposed for Abandonment

Well	*Aquifer*	*Type of Casing*
D 11	*2*	*?*
ERB 2	*2*	*PVC*
ERB 6	*1*	*PVC*
ERB 7	*1*	*PVC*
ERB 9A	*1*	*PVC*
ERB 9B	*1*	*PVC*
ERB 10	*1*	*PVC*
ERB 12	*1*	*PVC*
SC 11A	*0*	*Stainless Steel*
SC 11B	*2*	*Stainless Steel*

Response

BFI of Colorado and BNR agree that Well C-4 is not the only well that should be abandoned at the Sand Creek Superfund Site. However, it is our understanding that these wells were installed for purposes of evaluating other potential sources of groundwater contamination and, as such, would be considered for abandonment under the OU 4 RD/RA program.

Comment No. 21, page 4-6, Section 4.1.4

The locations mentioned for the landfill gas monitoring program should also be monitored periodically for organic compounds other than methane to ensure that contaminants are not being released to the environment at unacceptable levels.

Response

The landfill gas monitoring program described in the text was developed during drafting of the Operation and Maintenance Manual for the OU 6 Landfill Gas-extraction System (LFGES) and was implemented with the startup of the system (May 1991). It is the joint opinion of BFI of Colorado and BNR that monitoring for methane, as being representative of landfill gas, provides appropriate information for continued operation and optimization of the LFGES and minimization of vertical and horizontal migration of landfill gas.

Comment No. 22, page 4-9, last paragraph, third sentence (Section 4.2.4, Groundwater Sampling)

Quantitatively define "stabilization" of each field groundwater parameter (e.g., as an absolute or relative range of parameter values within which two ore more successive measurements fall).

Response

Temperature, pH, and electrical conductivity of the purge water will be measured after each purge volume is removed from a monitoring well. For a well to be "stabilized," three consecutive purge volume measurements should vary by no more than ± 0.2 pH unit, ± 10 percent of the electrical conductivity, and ± 10 percent of the temperature. As stated in the text, these detailed sampling procedures will be outlined in the updated FSP.

Comment No. 23, page 4-9 (Section 4.2.4, Groundwater Sampling)

For groundwater monitoring wells that have low yields, it is important not to draw the wells down completely by purging the wells too rapidly. It is better to purge them slowly so the groundwater does not cascade into the well causing a loss of VOCs.

Response

BFI of Colorado and BNR agree that low yield wells should be purged slowly.

page 4-9, Section 4.2.4, Ground Water Sampling

The sampling procedure is given. The PRPs must follow the EPA SOPs for purging, and should consider low-flow sampling.

Response

HLA, on behalf of BFI of Colorado and BNR, received EPA Region VIII Standard Operating Procedure (SOP) #4.1 for Well Purging, #7.2 for Survey Control Requirements, and #3.2 for Well Development on July 18, 1994. These SOPs will be reviewed and incorporated, as appropriate, in the updated FSP.

page 4-9, last paragraph, fourth sentence (Section 4.2.4, Groundwater Sampling)

How will purged groundwater be disposed of? Requirements and options for handling purged groundwater are described in the CERCLA "Guide to Management of Investigation-Derived Wastes" (OSWER Directive 9345.3-03FS, April 1992).

Response

It is the joint opinion of BFI of Colorado and BNR that sufficient information exists to consider the purged groundwater nonhazardous according to 40 Code of Federal Regulations 262.11(c)(2).

Comment No. 24, page 4-10, Well Abandonment Procedures, Item 4

There should be no use of "clean" fill for backfilling. "Locally derived clean borehole cuttings or other clean on site materials..." are not acceptable.

Response

The text has been revised to indicate that only grout will be used for backfilling.

page 4-10 (Section 4.3.1, Procedures)

In addition to those measurements specified in Item 1, the following information should be collected prior to abandonment.

- *Total depth of the monitoring well.*
- *The length of the casing, the length and slot size of the screen, the interval and size of the filter pack, the intervals of grout and bentonite seals, and the length of a sump if one is present.*

This information will enable a comparison to be made between the state well construction and the actual observed construction. In a case where the filter pack has been placed only a foot or so below a contaminant source, as in the C-4 well, the actual well construction data may help identify the pathway by which the contamination may have migrated into Aquifer 0.

Response

The text has been revised to include the collection of the additional information cited, if feasible.

page 4-10, Item 4

Since the C-4 monitoring well is suspected as being the pathway for contaminant migration from the Landfill to Aquifer 0 because of a poor bentonite seal, it is imperative that every effort is made to ensure the borehole is sealed when it is abandoned. To do this the grout should be placed using a tremmie pipe regardless of whether the static water level is below the bottom of the borehole. By placing the grout using a tremmie pipe, it ensures that no voids are left within the grout, especially across the interval between the base of the landfill and the conductive materials within Aquifer 0. If the grout was poured into the borehole, it would not be possible to ensure the borehole was sealed and did not have open spaces hidden within the cement grout.

Response

The text has been revised to reflect the tremmie pipe method.

page 4-11, second paragraph

Even though it is anticipated that wastes and debris resulting from the abandonment of monitoring well C-4 will be non-hazardous, the wastes should be drummed, sampled, and analyzed to determine their status. Once the wastes are characterized, they should be disposed of properly.

Response

It is the joint opinion of BFI of Colorado and BNR that sufficient information exists to consider the subject waste and debris nonhazardous according to 40 Code of Federal Regulations 262.11(c)(2).

page 4-11, last paragraph

Prior to spraying debris that will be recycled or reused, it is important to scrub the item with detergent in order to remove contamination that can not be removed with hot pressurized water alone.

Response

The text has been revised accordingly.

Comment No. 25, page 5-1 (Section 5.1, Well Abandonment Report)

The well abandonment report, Form No. GWS-9, required by the State Engineer does not contain all of the information that the EPA needs. The well abandonment report prepared for the EPA should include additional details concerning the well construction, such as: the screened interval and slot size, the filter pack interval and size, the grout and bentonite seal intervals, and the length of a sump if one was present.

Response

Text regarding collection of the additional information requested by EPA was added to Section 4.3.1 and additional information (if available) will be recorded on the field forms. The field forms will be included with Form No. GWS-9 as the well abandonment report submittal to EPA. The text has been revised accordingly.

Comment No. 26, page 5-2, Section 5.3

The first bullet of the page states that a statistical evaluation of the ground water monitoring data will be performed after two years of collecting data. How is the potential for migration addressed in the interim? 2

Response

See Response to Comment No. 15, page 3-6, Section 3.1.5.2, regarding the statistical evaluation.

Page 5-2, Semiannual O & M Reports, Bullet 1

This bullet may need to be revised based on this review of the proposed procedure by a statistician. Also, for Bullet 4, clarify that the data will be provided to EPA in a computer readable format (3.5" Discs) that is agreed upon in advanced with EPA.

Response

Because no statistical evaluation of groundwater data will be performed (in accordance with EPA's request), Bullet 1 has been revised accordingly. See response to of Comment No. 13, third and fourth sentence (Section 3.1.4.2, Groundwater Sampling and Chemical Analysis), regarding computer-readable format for data.

DISTRIBUTION

Final Work Plan/Remedial Design Report
for the Remedial Design/Remedial Action
48th and Holly Landfill
Commerce City, Colorado

July 29, 1994

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APPENDIX D

CDPHE Soil Reuse and Clean Fill Guidance (June 2020)

COLORADO
Department of Public Health & Environment

Soil reuse and clean fill

Purpose and background

This guidance seeks to clarify how disturbed or excavated soil can be classified as either environmental media, solid waste, or hazardous waste based on Colorado's Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2, Part 1), or "the Solid Waste Regulations."

The Solid Waste Regulations do not define clean fill. However, CDPHE considers environmental media and soil containing concentrations of constituents at or less than unrestricted land use values to be clean fill. Unrestricted land use values are discussed in the Screening Levels section below. The Solid Waste Regulations define environmental media as:

> "Environmental Media means earth materials including soil, sand, silt, gravel, rock, stone, sediment, and other naturally occurring solids."

Applicability

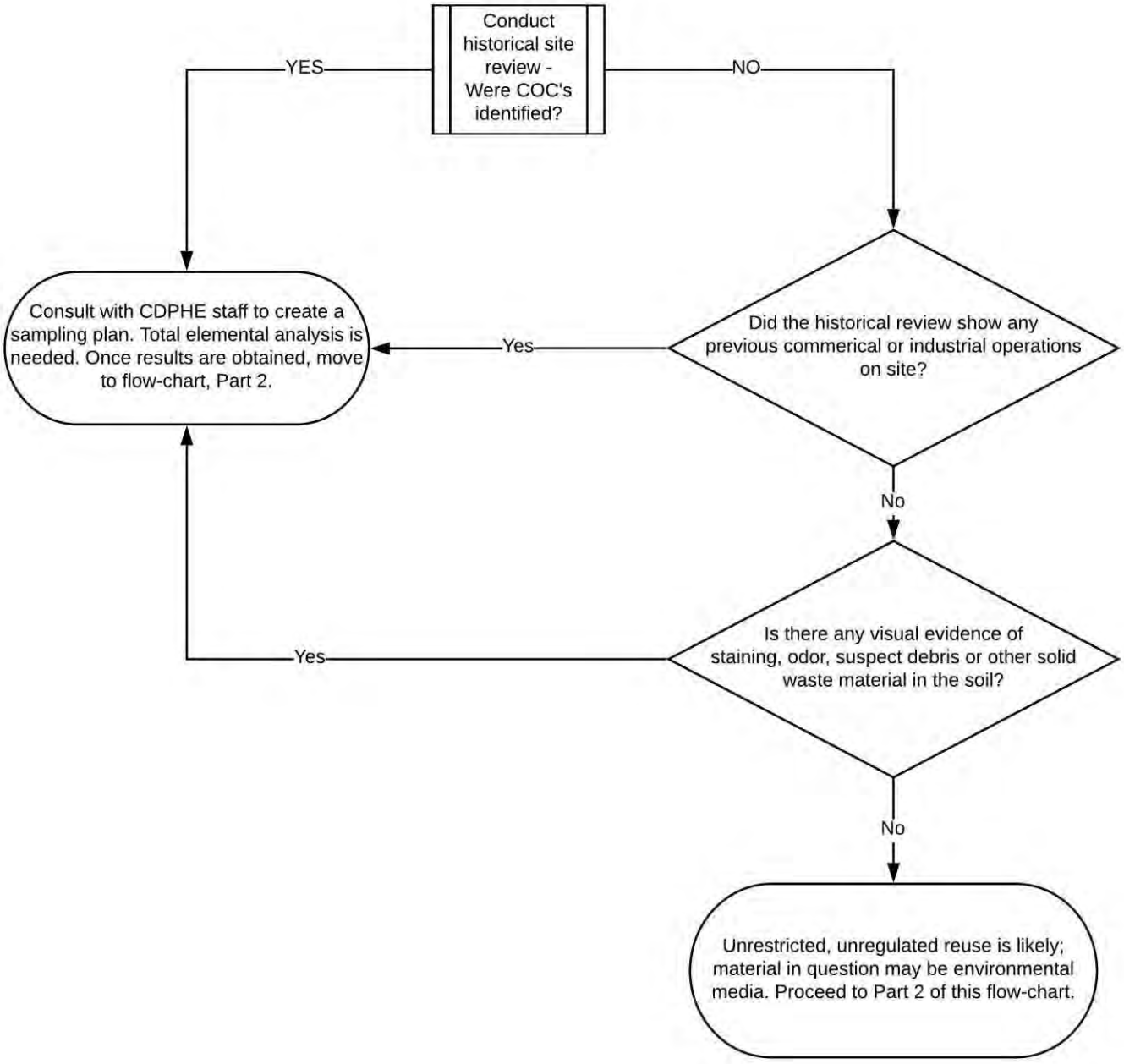
Confusion surrounding the reuse of soil excavated from construction sites is widespread. The processes outlined in this guidance will provide consistent procedures to determine whether soil can be reused or needs to be regulated and disposed of as a solid or hazardous waste. After proper characterization, the reuse of soil can reduce hauling costs, disposal fees and vehicle emissions while diverting excess soil from landfills. A condensed definition of Solid Waste, in accordance with 6 CCR 1007-2, is provided below. Please refer to the full definition to determine those items that are not considered solid waste.

> "Solid Waste means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, air pollution control facility, or other discarded material: including solid, liquid, semisolid, or contained gaseous material resulting from industrial operations, commercial operations or community activities."

Characterization procedures

1. Before soil is disturbed, an environmental assessment of the site should be conducted to identify potential contamination based on previous site operations. Before non-residential property is acquired during a real estate transaction, an ASTM standardized Phase I Environmental Site Assessment (2014)[1] is routinely conducted. This kind of assessment may identify potential contaminants of concern (COCs) on site. For sites without a Phase 1 report, review of site conditions, historical documents and other records can be used to evaluate previous site activities (e.g., Google Earth, aerial photographs, property records, etc.). If industrial operations and some commercial operations, like dry cleaners and gas stations, were historically conducted on site, soil contamination may exist. In accordance with the Solid Waste Regulations, any site where review of historical information (including Phase I or Phase II environmental site assessments) reveals possible contamination on site, then a Beneficial Use

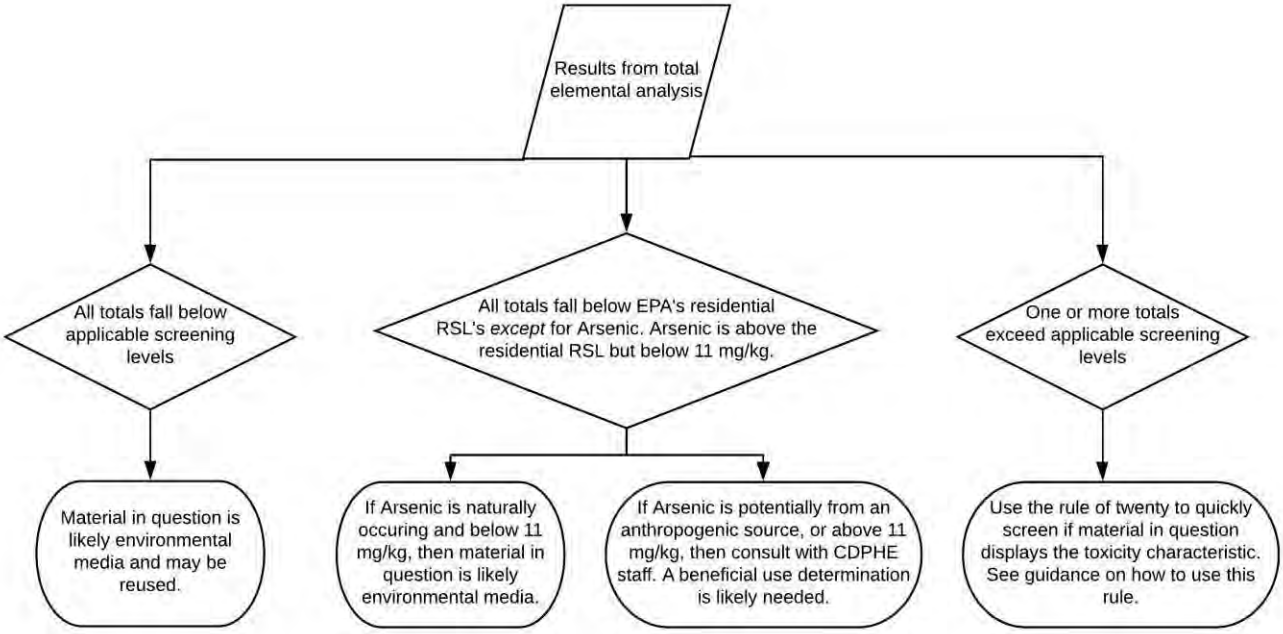
Determination may be required prior to soil reuse. Consult with staff if this situation occurs.



2. If the historical review and/or Phase I Environmental Site Assessment results show no evidence of commercial or industrial activities that may have contaminated the site, the excavated material has no visual staining or odor, and there is no suspect debris or other solid waste in the excavated material, then the material can be assumed to be clean fill and no further investigation is necessary. Proof of a completed site review should be made available if needed throughout the project. Any amount of debris in the soil qualifies the soil as solid waste, unless the debris can be removed from the

soil. Debris that is suspect / potential asbestos-containing material such as bricks with old adhesive, insulating material, insulated pipe, roofing materials, vinyl floor tiles, cement materials, plaster, drywall and associated joint compound materials, etc. may trigger Section 5.5 of the Solid Waste Regulations for the Management of Regulated Asbestos -Contaminated Soil (RACS). If there is any potential asbestos-contaminated material present on the site, then a Colorado Certified Asbestos Building Inspector (CABI) must conduct an inspection to determine if there are suspect materials in the soil that may contain asbestos, and to collect samples accordingly. Reference Section 5.5.1, Scope and Applicability, of the Solid Waste Regulations to determine specific requirements of the owner or operator.

3. If the historical review indicates previous industrial activities, or any other use that might have introduced contaminants of concern into the soil, soil characterization is necessary. CDPHE staff can assist in developing the appropriate list of chemical constituents being tested for prior to sample collection. A representative number of samples should be taken in order to accurately characterize for constituents in the soil. In addition, soil should be visually assessed for chemical staining or odors. During site visits and inspections, staff should follow, "looks bad, smells bad" characterization protocol; visual evidence of staining, presence of non-soil material, presence of odors and/or unique layering not found elsewhere should all be considered suspect, representatively sampled, and laboratory analyzed to determine reusability. Staff should ensure that samples are analyzed for the appropriate chemicals based on historical context. Sampling protocol should follow EPA guidance (2002)[2] and analysis should be tailored to the site's previous use and presumed contaminants of concern. Accompanying EPA guidance, Section 4 of the Corrective Action Guidance (2002)[3] provides specific information regarding site characterization investigations and details CDPHE accepted protocol and methodology. Generally, a total elemental analysis should be performed first on solid samples and compared to values described in the Screening Levels section, below. Use the following decision matrix based on the total elemental analysis.



4. If all constituent concentrations are at or below the screening levels indicated in the following section and there is no visual evidence of debris, soil can be deemed clean fill and would be available for unrestricted land reuse. Consult with CDPHE staff if soil meets constituent criteria yet has visual evidence of impact. If arsenic is the only constituent in exceedance, contractors should consult with CDPHE staff. If one or more constituents exceeds the unrestricted use values, soil cannot be reused in a residential exposure scenario (i.e., unrestricted land use) and must be managed in accordance with the Solid Waste Regulations. When constituents in soil exceed the unrestricted use concentrations but are below the industrial values on the RSL's, such soil may be available for reuse in a restricted use scenario with an approved Beneficial Use Determination and possible environmental covenant or restrictive notice on the property seeking to reuse the impacted soil. Beneficial Use Determinations (BUDs) are subject to separate regulations (6 CCR 1007-2 C.R.S., Section 8.6) and the application for a BUD can be found on CDPHE's website at the following link: https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/417423 More information on environmental covenants is available here: https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/428827

5. If the material in question exceeds screening levels and cannot be reused as clean fill then it should be determined if the material in question is considered a hazardous waste. Generally, the rule of twenty can be used to quickly screen if total elemental concentrations fall within solid waste or hazardous waste determination levels. The rule of 20 should not be solely used when making a hazardous waste determination. Rather, use the rule of 20 for a quick evaluation of whether the material in question is considered a solid or hazardous waste. For an example of using the rule of 20 please see the corresponding section below.

6. In order to dispose of soil that is solid waste, most landfills require Toxicity characteristic leaching procedure (TCLP) results before accepting the waste. TCLP results must be used to ultimately make a hazardous waste determination. Again, the rule of 20 should only be used as a quick screening tool. Once TCLP results are obtained to make a hazardous waste determination, compare the TCLP results to the maximum concentrations listed in Table 1 (Maximum Concentrations of Contaminants for the Toxicity Characteristic), found in Section 261.24 of Colorado's Hazardous Waste Regulations (6 CCR 1007-3), "the Hazardous Waste regulations." If the excavated material contains COCs that exceed maximum thresholds then the material in question exhibits the toxicity characteristic and must be handled and disposed of in accordance with the Hazardous Waste Regulations. Any questions regarding hazardous waste management may be provided to the Hazardous Waste Corrective Action Unit of the Hazardous Materials and Waste Management Division.

Screening levels

When characterizing soil, constituents included on CDPHE's Groundwater Protection Values[4] (GPVs) should be the starting point for the analytical list. Constituents not on the GPV list but are suspect based on site / process knowledge, should be included on the analytical list for laboratory analysis.

Laboratory data should be compared or screened against the lowest value from either the GPVs or from the most recent EPA Regional Screening Level Summary Table[5] (RSLs, TR=1E-06, THQ=1.0). If constituent concentrations are below corresponding screening values, then the soil in question can be classified as clean fill and approved for unrestricted use. Links to the GPVs, RSLs, and EPA's Maximum Contaminant Levels are provided below.

- CDPHE Groundwater Protection Values: https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/413311
- EPA Regional Screening Level Summary Table - see values in "Resident Soil" column: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables
- Table 1 (Section 261.24)- Maximum Concentrations of Contaminants for the Toxicity Characteristic:
- https://drive.google.com/file/d/1zlW-gCfyMbb8JPB_fPIIfBtQ4Ukvf0aZ/view

Rule of 20

Total elemental analysis is typically performed on 100 mg subsample of material. Because of this, during the TCLP procedure the sample is diluted with a volume of extraction fluid that equals 20 times the weight of the sample. If all constituents in the sample completely dissolve, then the constituent concentrations in the extraction fluid will always be 20 times less than its original concentration in the total elemental sample. Because of this 20:1 dilution ratio, the rule of 20 can be used to quickly determine whether a waste is hazardous or not based on the total elemental analysis. Here's how the Rule of 20 can be used:

- Take the current TCLP screening level (in mg/L) for a given constituent and multiply that value by 20.
- If the total elemental analysis in (mg/kg) is equal to or more than the associated screening level then the waste may be hazardous and should be handled as such until TCLP analysis can be completed.

For example:

- Current TCLP screening level for Benzene = 0.5 mg/L
- 20 x TCLP limit or 20 x 0.5 = 10
- If the total elemental analysis for Benzene is equal to or more than 10 mg/kg then the waste may be hazardous and should be handled as such until TCLP analysis can be completed.

It is worth noting that just because total results come back below residential RSL's that does not mean TCLP testing is not necessary. It is possible to have low totals for certain constituents but those constituents may still leach above the TCLP limits.

TPHs, Petroleum sites, Arsenic and other considerations

- Concentrations for Total Petroleum Hydrocarbons (TPHs) are not always representative of other chemical compounds encompassing TPH. Because of this, TPH concentrations should only be used as a screening tool; if TPHs are present then analysis for VOCs and/or SVOCs will be required. Otherwise, TPH should not be used when characterizing soil for reuse potential. Instead polycyclic aromatic hydrocarbon (PAH) concentrations should be tested, analyzed, and the results compared to the residential RSLs and the GPVs. This will ensure accurate characterization of PAHs.

- For sites with confirmed petroleum based releases, procedures outlined in the Emergency Petroleum Spill Waste Management Guidance[6] should be followed.
- Due to weathering of bedrock, elevated background concentrations for Arsenic are commonly found in Colorado. CDPHE guidance (2014) [7] specifically addresses background arsenic in soils and established Colorado specific arsenic screening values. These values may be used instead of the EPA's RSLs. If arsenic is a constituent of concern on the site, consult with CDPHE staff prior to reuse of any soils with arsenic elevated beyond the EPA residential RSLs.
- This guidance only applies to the terrestrial excavation and application of soil.
- Make every attempt to have laboratory detection limits lower than the applicable screening table values.

References

[1] ASTM, 2014. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, E1527-13. https://www.astm.org/Standards/E1527.htm
[2] EPA, 2002. Guidance on Choosing a Sampling Design for Environmental Data Collection, EPA QA/G-5s. https://www.epa.gov/sites/production/files/2015-06/documents/g5s-final.pdf
[3] CDPHE, 2002. Corrective Action Guidance Document. https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/189097
[4] CDPHE, 2014. Groundwater Protection Values Soil Cleanup Table. https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/413311
[5] EPA, 2016. Regional Screening Levels-Generic Tables (May 2016). https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016
[6] CDPHE, 2014. Emergency Petroleum Spill Waste Management Guidance. https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/Recordview/403428
[7] CDPHE, 2014. Arsenic Concentrations in Soil, Risk Management Guidance for Evaluating. https://environmentalrecords.colorado.gov/HPRMWebDrawerHM/RecordView/403417

APPENDIX E

Conditional Waste Water Discharged Permit
(Permit No. S0330-1)

WELLINGTON E. WEBB
Mayor

CITY AND COUNTY OF DENVER

DEPARTMENT OF PUBLIC WORKS

WASTEWATER MANAGEMENT DIV.
2460 W. 26th Avenue, Suite 300C
Denver, Colorado 80211

Conditional Wastewater Discharge Permit No. S0330-1

Pursuant to the provisions of the Revised Municipal Code of the City and County of Denver, Section 56-102.5, as enacted August 8, 1985, and amended (hereinafter referred to as the "Revised Municipal Code"), **Landfill Inc./Burlington Northern Railroad** (hereinafter referred to as the "permittees") located at **5185 E. 50th Ave.**, are authorized by the City and County of Denver (hereinafter referred to as the "City") to discharge to the sanitary sewer system, in accordance with the effluent limitations, monitoring requirements and other conditions set forth herein.

This permit is issued to: Landfill Inc./Burlington Northern Railroad
5185 E. 50th Ave.
Denver, Colorado 80216

This permit shall become effective November 1, 1991.

This permit shall expire October 31, 1994.

The deadline to apply for permit reissuance is August 1, 1994.

Telephone numbers of Regulatory Agencies:

Wastewater Management Division, Pretreatment Section	296-5780
Metro Wastewater Reclamation District	289-5941
Metro Wastewater Reclamation District (after business hours)	289-5949

Issued this 1st day of October, 1991, by the City and County of Denver.

Authorized by: _____
Nick Skifalides, P.E., Deputy Manager of Public Works

Approved this 31st day of October, 1991, by Metro Wastewater Reclamation District.

Approved by: _____
Stephen R. Pearlman, Director of Regulatory and Connector Relations

A. DESCRIPTION OF OUTFALLS

Outfall	Description/Location
A	A 3" PVC condensate outfall line from the 10,000 gallon underground condensate storage tank tapping into a 8" sanitary sewer in E. 50th Ave. approx. 550′ south of the storage tank, flowing west.

B. DESCRIPTION OF MONITORING POINTS

Monitoring Point	Description/Location
001	A water sample valve located inside of a lockable concrete manhole with a 54" aluminum lid, approx. 475′ south of the underground storage tank.

C. MONITORING FACILITIES

The permittees shall allow the Manager of Public Works or the duly authorized representative or representatives of the Metro Wastewater Reclamation District (hereinafter referred as the "Metro District") to independently utilize these facilities to collect samples or take measurements or readings. The permittees shall also provide these representatives with any assistance and technical information required to operate the facilities.

D. EFFLUENT LIMITATIONS

1. Specific Effluent Limitations

Monitoring Point 001

Effective immediately, the permittees shall not discharge wastewater in excess of 10,000 gallons per day, or containing any of the following materials or substances in excess of the concentrations below:

Monitoring Point 001

Pollutant	Instantaneous Maximum (a)
Cadmium(total)	1.2 mg/L
Chromium (total)	7.5 mg/L
Copper (total)	4.5 mg/L
Lead (total)	15.0 mg/L
Mercury (total) (b)	0.13 mg/L
Nickel (total)	15.0 mg/L
Silver (total)	0.25 mg/L
Zinc (total)	12.0 mg/L
Cyanide (total)	2.0 mg/L
Oil/Grease (total)	75.0 mg/L
pH, units	Shall remain between 6.0 and 9.0, inclusive

(a) Any single analysis and/or measurement beyond this limitation shall be considered a violation of the conditions of this permit.

(b)This limitation may be imposed directly on mercury-containing wastewaters prior to dilution by domestic and other non-mercury-containing wastewaters discharged by the permittee.

2. Prohibited Discharges

Unless otherwise provided above, the "Prohibited Discharges to the Sanitary Sewerage System" set forth in Section 7.02 of the City's Rules and Regulations Governing Sewerage Charges and Fees and Management of Wastewater and Sections 6.13, 6.14, and 6.16 of the Metro District's Rules and Regulations, shall govern all discharges to the Publicly Owned Treatment Works (hereinafter referred to as the "POTW") during the term of this permit. The POTW includes City and Metro District sewer lines and the Metro District treatment plant. Copies of these documents are found in Appendix A of this permit.

E. SELF-MONITORING

1. At a minimum, the permittees are required to perform collection and analyses of wastewater samples with the frequency and type of measurement indicated. Samples or measurements shall be representative of the discharge during normal operating conditions and shall be taken at the monitoring points specified in this permit. Samples collected as splits from monitoring performed by the City or the Metro District, or samples collected in response to noncomplying discharge (Section E.2) may not be used to fulfill self-monitoring requirements. Equipment or instrumentation used for self-monitoring must be maintained and calibrated according to the manufacturer's specifications. Maintenance and calibration records must be kept on site and available for inspection.

Monitoring Point and Parameter	Monitoring Frequency	Sample Type (1)
Monitoring Point 001		
Flow	Continuous	Meter
Oil & Grease	One per month	Grab
Chromium, total	"	Grab
Copper,total	"	Grab
Lead,total	"	Grab
Nickel, total	"	Grab
Zinc, total	"	Grab
Cyanide,total	"	Grab
pH, units	"	Grab or Instantaneous
Cadmium	"	Grab
Base/Neutral/Acid Extractable Organic Compounds (2)	"	Grab

(1) Definitions:

a. A "grab" sample is defined as a single "dip and take" sample collected at a representative point in the discharge stream, and collected so as to be representative of the parameter being monitored.

b. An "instantaneous" measurement is defined as a single reading, observation, or measurement.

(2) To be analyzed using EPA Methods 625, 1625 or equivalent. A list of the minimum required parameters is contained in Appendix C of this permit.

2. Increased Sampling in Response to Noncomplying Discharge.

a. If sampling performed by the permittees indicates a violation of the terms and conditions of this permit, the permittees shall repeat the sampling and analysis for the parameter(s) in violation.

b. Resampling of the noncomplying parameter(s) shall commence within 48 hours or on the first available work day representative of normal operations after a violation has been discovered.

c. Resampling is not required if the City performs sampling at a frequency of at least once per month, or if the City or Metro District performs sampling between the time the permittee performs its initial sampling and the time when it receives the results of this sampling. It is the responsibility of the permittee to ascertain that one of the above named agencies did conduct a monitoring event which voids the requirement to resample. Failure to resample as required above is considered a violation of the terms of this permit. Questions can be directed to the agencies at the phone numbers listed on the first page of this permit.

3. Test Procedures

Test procedures for the analysis of pollutants shall conform to the analytical techniques described in Title 40, Part 136, of the Code of Federal Regulations (40 CFR 136), Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act, and amendments thereto. Where 40 CFR 136 does not contain sampling or analytical techniques for the pollutant(s) in question, or where the Administrator of the United States Environmental Protection Agency determines that the Part 136 sampling and analytical techniques are inappropriate for the pollutant(s) in question, sampling and analysis shall be performed by using validated analytical methods or any other applicable sampling and analytical procedures, including procedures suggested by the City or the Metro District, or other parties, approved by the Administrator.

F. REPORTING REQUIREMENTS FOR PERMITTEE

The following reports shall be submitted to the Pretreatment Coordinator, Wastewater Management Division, Pretreatment Section, 5100 Marion Street, Denver, Colorado 80216.

1. Monthly Compliance Reports

Monthly compliance reports containing the results of monitoring obtained during the previous month shall be submitted on or before the last day of the month. These reports must include the following information:

(1) Analytical results of all samplings of the regulated wastestreams including the results of any self-monitoring done by the permittee and any results transmitted to the permittee by any other agency.

(2) Date, time and monitoring location of all sampling activities.

(3) Concentrations and measurements of all parameters for which there are self-monitoring requirements (Part E.1).

(4) Measured or estimated average and maximum daily flows at Monitoring Point 001.

(5) The following certification statement: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

(6) If no discharge occurs during the reporting period, "no discharge" shall be reported in lieu of Sections F.1.(1),(2),(3), and (4) of this permit.

(Note: Blank forms for this report may be obtained from the Pretreatment Coordinator at Wastewater Management Division.)

2. Noncompliance Notification

If any self-monitoring reveals a violation of any discharge limitations specified herein, the permittees shall notify the City within 24 hours of becoming aware of the violation. Within five working days of becoming aware of any violation, (from self-monitoring, Denver or Metro District sampling events) the permittees shall provide the following information in writing:

a. A description of the discharge and cause of noncompliance.

b. The exact date(s) and time(s) of noncompliance.

c. Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

In addition, within 30 days of becoming aware of any self-monitoring violation, the permittees shall submit the analytical results from the sample(s) collected in response to noncompliance as described in Section E.2 of this permit.

3. Accidental Discharge Report

In the event of an accidental or unusual discharge, the permittees shall immediately notify the Wastewater Management Division of the City (296-5780) and the Metro District (weekdays 289-5941; weekends and after hours 289-5949) by telephone. An accidental discharge report must also be submitted within five days after commencement of the discharge. Section G of this permit discusses report

requirements.

4. Changed Discharge Reporting

The permittees shall notify the Wastewater Management Pretreatment Coordinator and the Metro District in advance of any significant changes in the plant or pretreatment system operations, or any substantial change in the volume or character of pollutants in its discharge, including the listed or characteristic hazardous wastes for which the permittee has submitted initial notification under 40 CFR 403.12(p) and Section F.6 of this permit.

5. Bypass Notification

In the event of an unavoidable bypass of pretreatment facilities, the permittees shall submit prior notice to the City and the Metro District as described in Section I.2 of this permit.

6. Hazardous Waste Discharge Reporting

a. Within 180 days of commencing any discharge to the POTW of a substance, which, if otherwise disposed of, would be a hazardous waste under 40 CFR Part 261, the permittees shall notify in writing the Metro District, the Regional Waste Management Director of the Environmental Protection Agency, and the Waste Management Division Director of the Colorado Department of Health.

This notification must include the following information:

1) The name of the hazardous waste as set forth in 40 CFR Part 261.

2) The EPA hazardous waste number.

3) The type of discharge (continuous, batch or other).

If the permittees discharge more than 100 kilograms of such waste per calendar month to the sewer, the notification shall also:

4) Identify the hazardous constituents contained in the wastes.

5) Estimate the mass and concentrations of such constituents in the wastestream discharged during that calendar month.

6) Estimate the mass of constituents in the wastestream expected to be discharged during the following twelve months.

Any notification required by this part needs to be submitted only once for each hazardous waste discharged. However, notification of changed discharges must be submitted according to Section F.4 of this Permit. The notification requirements in this part do not apply to pollutants already reported under the self-monitoring requirements described in Section E.1 of this permit.

b. The permittees are exempt from the requirements of Paragraph a, above, during a calendar month in which they discharge no more than 15 kilograms of hazardous wastes, unless the wastes are acute hazardous wastes as specified in 40 CFR 261.30(d) and 261.33(e). Discharge of more than 15 kilograms of non-acute hazardous wastes in a calendar month, or of any quantity of acute hazardous wastes, requires one-time notification, as specified above.

   Subsequent months in which the permittees discharge more than such quantities of any hazardous waste do not require additional notification.

c. In the case of any new regulations under section 3001 of the Resource Conservation and Recovery Act (RCRA) identifying additional characteristics of hazardous waste or listing any additional substance as hazardous waste, the permittees must notify the same agencies described above of the discharge of such substance within 90 days of the effective date of the new regulations.

d. In the case of any notification made pursuant to this part, the permittees shall certify that it has a program in place to reduce the volume and toxicity of hazardous wastes generated to the degree it has determined to be economically practical.

G. ACCIDENTAL DISCHARGE PREVENTION AND REPORTING

The permittees shall provide adequate physical structures and operational procedures to prevent the accidental discharge of toxic or hazardous materials to the POTW. The permittees are required to modify chemical storage methods or locations, construct secondary containment facilities, seal floor drains, change housekeeping procedures, and make any other changes necessary to prevent accidental spills from reaching the POTW.

The permittees shall post a notice on a bulletin board or other prominent place advising employees whom to call in the event of an accidental discharge. The permittees shall advise all employees who may cause, suffer, or become aware of an accidental discharge of the emergency notification procedure.

In the event of an accidental or unusual discharge, the permittees shall immediately notify Wastewater Management of the City and the Metro District by telephone. The permittees shall also provide the Manager of Public Works with the following information in writing within five days after commencement of the discharge:

1. Location or source of the discharge.
2. Date, time, and duration of discharge.
3. Type, concentration, and volume of discharge.
4. Cause of the discharge.
5. Steps to be taken by the permittee to prevent recurrence of discharge.

Such notification shall not relieve the permittees of any expense, loss, damage, or other liability which may be incurred as a result of damage to the POTW, fish kills, or any other damage to person or property, nor shall such notification relieve the permittee of any fines, civil penalties, or liability which may be imposed by the Revised Municipal Code or other applicable laws or regulations.

H. SPECIAL REQUIREMENTS

1. Slug Loading Control Plan

If deemed necessary by the City or the Metro District, the permittees will be required to develop a slug loading control plan. This plan shall include a description of discharge practices, including nonroutine batch discharges; description of stored chemicals; procedures for promptly notifying the POTW of slug discharges, and procedures for follow-up written notification within five days. The permittees must submit this plan within 60 days of being notified to do so by the City. Following approval of this plan by the City, the permittees are required to implement and comply with this plan. A copy of the approved plan will be included as Appendix B of this permit.

2. Priority Pollutants Screening

If deemed necessary by the City or the Metro District, the permittees will be required to perform a priority pollutants screening of its discharge at least once every five years. The permittees will be notified in advance of the screening requirement and a list of the pollutants will be provided.

I. GENERAL CONDITIONS

1. Pretreatment Facilities Requirement

The permittees shall provide and maintain, at their own expense adequate facilities to consistently meet the effluent limitations established by this permit. The permittees shall at all times maintain these facilities in good working order and operate them as effectively as possible to achieve compliance with the terms and conditions of this permit.

Review and approval of treatment system components and safeguards by Wastewater Management shall not relieve the permittees from the responsibility to modify its facility or operations as necessary to meet the requirements of this permit.

2. Bypass of Pretreatment Facilities

Bypass of pretreatment facilities is prohibited unless: (1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; (2) there were no feasible alternatives to the bypass; and (3) the permittees submitted notices as required below. Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

If the permittees know in advance of the need for a bypass, they shall submit prior notice to the City and the Metro District, if possible at least ten days before the date of the bypass. Verbal notification of an unanticipated bypass shall be given 24 hours from the time the permittees become aware of the bypass. A written report shall also be provided within 5 days of the time the permittees become aware of the bypass. The written report shall contain a description of the bypass and its cause; the duration of the bypass, including exact dates and times, and, if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass. Upon request of the permittees, the City and the Metro District may waive submittal of the written report if the verbal report has been received within 24 hours.

The permittees may bypass the treatment system if the bypass does not violate specific or general pretreatment standards contained in this permit and only if it is necessary for essential maintenance to assure efficient operation. Bypasses that do not violate pretreatment standards are not subject to the reporting requirements described above.

3. Permit Noncompliance

The permittees must comply with all conditions of the permit. Any permit noncompliance constitutes a violation of the Revised Municipal Code. Such a violation may result in the imposition of liquidated damages or immediate suspension or revocation of this permit plus the immediate shutoff or severance of the sewer connection as provided for in the Revised Municipal Code and the imposition of civil and/or criminal penalties as provided for in the Federal Water Pollution Control Act or General Pretreatment Regulations.

a. Federal Penalties for Falsification of Reports

Sections 309(c)(4) and 309(c)(6) of the Federal Water Pollution Control Act (also known as the Clean Water Act, as amended, Title 33 of the United States Code, Part 1251, et seq.) and Title 18 of the United States Code, Part 1001, provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of up to $10,000, or by imprisonment for not more than two years, or by both, for the first such conviction. Subsequent convictions under this section shall be punished by fines of up to $20,000 per day of violation, or by imprisonment of not more than four (4) years, or by both.

b. Civil Penalties and/or Damages for Violations of Permit Condition

The Revised Municipal Code provides that civil penalties and/or liquidated damages may be imposed against any person who violates a permit covenant or condition. Liquidated damages shall be assessed based upon the schedule contained in the Rules and Regulations Governing Sewage Charges and Fees and Management of Wastewater, Section 7.04 C. Such liquidated damages may be assessed at not less than $50 per day nor more than $1,000 per day of such violation.

The Sewage Treatment and Disposal Agreement (Service Contract) and the Rules and Regulations Governing the Operation, Use and Services of the System (Rules and Regulations) of the Metro District provide that any user who is found to have violated

any provision of the Rules and Regulations, or orders or permits issued thereunder, is subject to a penalty not to exceed, except as noted below, $5,000 per violation per day. In addition to penalties, the District may recover reasonable attorney's fees, court costs, court reporter's fees, and other expense of litigation by appropriate suit of law against the permittee found to have been in violation. Such penalties shall be in addition to any actual damages the District may incur because of such violations.

Where a violation is found to have caused interference or pass through, the maximum penalty of $5,000 per violation may be increased as necessary to allow the Metro District to recover any fines or penalties paid for NPDES permit violations due to the interference or pass through.

c. Suspension and Severance of Service

The City may suspend sewerage service and/or this permit, and, if necessary, sever the sewer connection to stop an actual or threatened discharge which presents or may present an imminent or substantial endangerment to the health or welfare of persons, to the environment, threatens to interfere with the operation of the POTW, or causes the Metro District to violate any conditions of its NPDES or CDPS permit. The permittees' failure to comply with administrative orders issued by the City is also cause for suspending sewerage service and/or this permit and/or severing the sewer connection.

d. Civil and Criminal Liability

Nothing in this permit shall be construed so as to relieve the permittees from civil or criminal penalties for noncompliance.

e. Duty to Mitigate Adverse Impacts

The permittees shall take all reasonable steps to minimize adverse impacts to the POTW that results from noncompliance with any effluent limitation specified in this permit, including accelerated or additional monitoring if needed to determine the nature and impact of the noncomplying discharge.

f. Upset Conditions

An "upset" means an exceptional incident in which there is an unintentional and temporary noncompliance with the effluent limitations of the permit because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational

error, improperly designed or inadequate treatment facilities, lack of preventative maintenance, or careless or improper operations.

An upset may constitute an affirmative defense for civil penalties and/or liquidated damages assessed for the noncompliance. The permittees have the burden of proof to provide evidence and demonstrate that none of the factors specifically listed above were responsible for the noncompliance. An upset does not constitute an affirmative defense in any action to recover actual damages.

g. Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of the permit.

h. Specific Performance

This permit shall be specifically enforceable by any party hereto.

4. Federal and/or State Laws

Nothing in this permit shall be construed so as to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable federal and/or state law or regulations.

5. Facilities Operation

a. Dilution Prohibition

The permittees shall not increase the use of process water or in any way attempt to dilute a discharge in order to achieve compliance with any pollutant limitation.

b. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner that prevents such materials from

entering the POTW. The permittees are responsible to insure compliance with the Rules and Regulations pertaining to Hazardous Waste issued by the Colorado Department of Health (Title 6 of the Code of Colorado Regulations 1007-3, Part 260, et seq.). The Hazardous Materials and Waste Management Division of the Colorado Department of Health can be contacted for additional information at 331-4830.

6. Records Management

a. Record Keeping Requirements

The permittees shall retain for a minimum of three years any records of monitoring activities and results. Such records shall include the following information for all samples:

(1) The date, exact place, method, time of sampling, and the name of the persons taking the samples.

(2) The dates analyses were performed.

(3) The laboratory that performed the analyses.

(4) The analytical techniques/methods used.

(5) The results of such analyses.

b. Duty to Provide Information

The permittees shall furnish to the Manager of Public Works or the designee, within a reasonable time, any information which the Manager or the designee may request to determine whether cause exists for modifying, revoking and reissuing, terminating this permit or to determine compliance with this permit. The permittees shall also furnish, upon request, copies of records required to be kept by this permit.

c. Availability of Reports

Except for data determined to be confidential, or otherwise privileged pursuant to the laws of the State of Colorado, all reports prepared in accordance with terms of this permit shall be available for public inspection at Wastewater Management Division or the Metro District. As required by federal regulation, effluent data shall not be considered confidential.

d. Signatory Requirements

All reports or information submitted for the requirements of this permit must be signed and certified by an authorized representative(s) of the permittees, as follows:

(1) If the permittee is a corporation:

(a) A responsible officer of the corporation, specifically the president, secretary, treasurer, or vice president of the corporation in charge of a principal business activity, or any other person who performs similar policy or decision making functions for the corporation, or

(b) The manager of one or more manufacturing, production or operation facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) By a general partner if the permittee is a partnership, or by the proprietor if the permittee is a sole proprietorship.

(3) By a duly authorized representative of the individual designated in (1) or (2) above if the authorization is made in writing. Written authorization must:

(a) specify an individual or position having overall responsibility for the facility from which discharge originates, and

(b) be submitted to the City and the Metro District.

If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, or overall responsibility of environmental matters for the company, a new authorization must be submitted to the City and the Metro District prior to or with any reports to be signed by an authorized representative.

7. Right of Entry

The permittees shall allow the Manager of Public Works or the duly authorized representative and/or representatives of the Metro District bearing proper credentials and identification:

a. To enter all properties for the purpose of inspection, observation, measurement, sampling, and testing to determine compliance with the provisions of this permit.

b. To examine and copy any and all records required to be maintained by the permittee for the purpose of determining compliance with Pretreatment Standards and Regulations.

8. Permit Information

a. Permit Modification, Suspension, or Revocation

This permit may be modified, suspended or revoked in whole or in part, with cause in accordance with the provisions of the Revised Municipal Code. Causes that could lead to modifying, suspending, or revoking the permit include, but are not limited to, the following:

(1) Violation of any term or condition of this permit.

(2) Misrepresentation, falsification, or failure to disclose fully all relevant facts in either the permit or any required report.

(3) Promulgation of any new, additional, revised, or more stringent pretreatment standards or requirements or effluent limitations by the City, the Metro District, state or federal agencies.

(4) Change(s) in the process(es) used by the permittee or change(s) in the volume or character of the process discharge(s).

(5) Changes in design or capability of the receiving POTW.

(6) Change in any condition of the permittee, the City or the Metro District that requires either a temporary or permanent reduction or elimination of the authorized discharge.

(7) Information indicating that the permitted discharge poses a threat to the POTW, personnel of the City or the Metro District, or the receiving waters.

(8) To correct typographical or other errors in the permit.

(9) Failure to pay fines or to meet compliance schedules, tampering with monitoring equipment, or refusing to allow reasonable access to the facility premises or records.

(10) Upon request of the permittees, provided such request does not create a violation of any applicable requirements, standards, laws, or rules and regulations. The filing of a request by the permittees for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

b. Transferability

This permit is issued to the permittees for a specific operation. It cannot be reassigned, transferred, or sold to a new user, different premises, or a new or changed operation without prior notification to and written approval of the City. A copy of the existing permit must be provided to the new owner prior to transfer.

c. Reapplication

The permittees are responsible for filing an application for reissuance of the permit a minimum of 90 days prior to the expiration date of the permit.

d. Expired Permits

An expired permit will continue to be effective and enforceable until the permit is reissued if:

(1) The permittees have submitted a complete permit application at least 90 days prior to the expiration of the existing permit, and

(2) The failure to reissue the permit, prior to any expiration of any previous permit, is not due to any act or failure to act on the part of the permittees.

9. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or municipal laws and regulations.

10. Severability

The provisions of this permit are severable. If any provisions of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

11. No Exclusion by Implication

The restatement or inclusion herein of any provisions of the Revised Municipal Code or any Rules and Regulations shall not be construed so as to negate or lessen the applicability of any other such provision.

J. USER CHARGES AND FEES

All fees chargeable hereunder shall be subject to change, revision, or addition by the Manager of Public Works of the City of Denver upon thirty (30) days prior written notice to the permittee:

1. Significant Industrial Users fees and charges. The permittee shall be assessed at $240.00 per million gallons of regulated process flows contributed to the City and County of Denver Sewer System during each normal billing period.

2. Fees and charges for reimbursement of municipal expenses in setting up and operating the pretreatment/industrial waste control program may include the following:

   a. Expenses for the review and issuance of the Wastewater Contribution Permit shall be $250 per calendar year.

   b. The City will sample, analyze and report to the permittee each year. Expenses may be billed by the City, at actual cost including direct and indirect labor costs, for any additional sampling and analysis deemed necessary, for reviewing accidental discharge procedures and construction.

   4. Other expenses which the Municipality incurs in carrying out the Pretreatment/Industrial Waste Program.

Appendix A

Section 7.02 of the City's Rules and Regulations Governing Sewerage Charges and Fees and Management of Wastewater

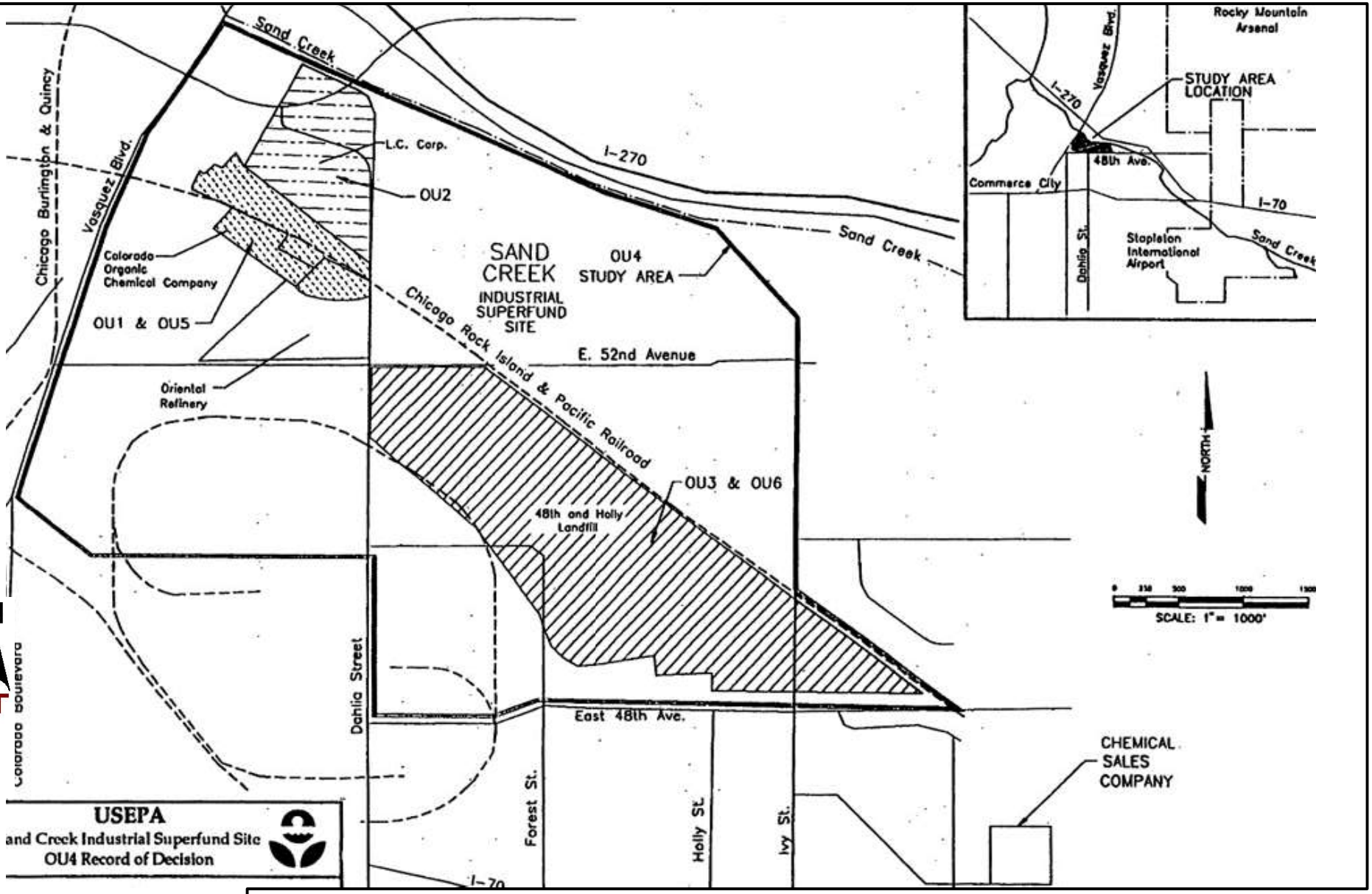
Sections 6.13, 6.14, and 6.16 of the Metro District's Rules and Regulations

APPENDIX F

Example Environmental Justice, Equitable Development, and Sustainability initiatives Cost Tracking Worksheet

	Potential Environmental Justice, Equitable Development, and Sustainability Initiatives	Base Cost w/o EJ (A)	Cost w/ EJ (B)	Target EJ Cost (B-A)	Included (Y/N)	% complete	Total Cost
1	Landfill Gas Extraction System modification and replacement with more efficient technology						
2	Replace Flare Station with updated technology to further reduce greenhouse gas emission						
3	Reuse landfill gas for supplemental energy						
4	Install EV charging stations or electrical infrastructure to allow for future flexibility						
5	Reflective roofing for reduced heat island effect						
6	Site lighting pollution reduction						
7	Provide electrical connectors at loading dock doors to reduce truck idling near the building						
8	Onsite stormwater management using low impact and green infrastructure practices						
9	Reclaim water for irrigation and/or install programmable irrigation control systems with rain detectors to minimize potable water consumption and runoff						
10	Provide exterior open space for building occupants for social interaction and recreation						
11	Native and Adaptive Landscaping						
12	Install bike racks and shower facilities in buildings to encourage low impact transportation						
13	Improve street level public transportation access/amenities (currently there are 5 bus stops on 48th for #37 bus routes and 3 bus stops on Dahlia for #49 bus route)						
14	Roof solar panels to generate electricity and possible redistribution to grid						
15	Specify and select materials with product declarations, including EPDs, HPDs						
16	Specify and select materials that can be sourced locally and contain recycled content						
17	Specify and select materials with low VOCs (flooring, cabinetry, paints/wall coverings, adhesives, etc.)						
18	Commissioning of energy and water using building features						
19	Variable Refrigerant or High Efficiency Packaged DX Equipment for conditioned spaces						
20	High efficiency LED lighting						
21	High efficiency plumbing fixtures and hands-free (motion sensor) faucets at sinks						
22	Install motion sensors and automatic shut off for interior lighting						
23	Provide natural daylight to reduce energy cost and provide for worker mental health benefits such as the installation of clearstory windows						
24	Drip irrigation along building foundation areas to minimize water consumption, which also reduces runoff and water infiltration by eliminating overspray.						
25	Reduce construction waste by 50% or greater by separating recyclable materials (metals, woods, plastics, cardboard, etc.).						
26	Add heat exchanger in Flare Station to generate heat and/or hot water for buildings						
	Total						

Appendix 2 – Site Map



Map Source: Figure 1. Sixth Five-Year Review Report For Sand Creek Industrial Superfund Site City and County of Denver and Commerce City, Coloraod – Prepared by US EPA 09.28.2020

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

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

Project No.	25207313
Scale:	AS SHOWN
File Name:	EXHIBITS
Date:	12/6/2021

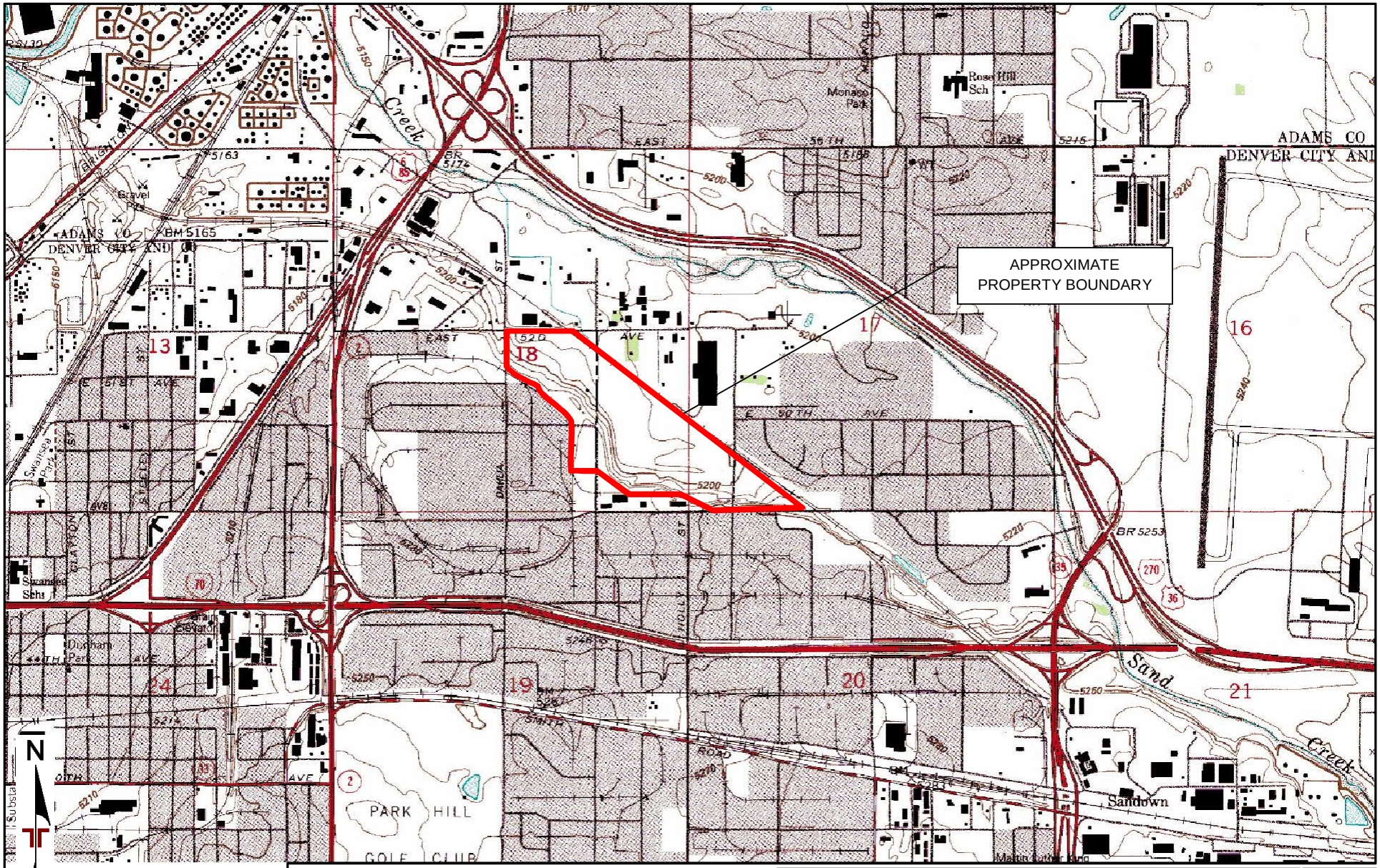
Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

SAND CREEK INDUSTRIAL SUPERFUND SITE

Landfill Gas Extraction System Modifications
CAI Industrial Holdings, LLC
Triangle Logistics Center
Commerce City Colorado

Figure 2

Appendix 3 – Property Map



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY QUADRANGLES INCLUDE: COMMERCE CITY, CO (1/1/1994).

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

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

Project No.	25207313
Scale:	1"=2,000'
File Name:	EXHIBITS
Date:	3/9/2022

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

SITE LOCATION MAP

Landfill Gas Extraction System Modifications
CAI Industrial Holdings, LLC
Triangle Logistics Center
Commerce City Colorado

Figure 1

Appendix 4 – Surveys & Legal Descriptions of the Property

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 18, AND THE SOUTHWEST QUARTER OF SECTION 17, TOWNSHIP 3 SOUTH, RANGE 67 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, ADAMS COUNTY, STATE OF COLORADO

LEGAL DESCRIPTION

PARCEL ONE:

A TRACT OF LAND SITUATE IN THE COUNTY OF ADAMS, STATE OF COLORADO, SECTIONS 17 AND 18, TOWNSHIP 3 SOUTH, RANGE 67 WEST OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE SOUTHERLY LINE OF SAID SECTION 17, A DISTANCE OF 20.00 FEET WESTERLY FROM THE SOUTHEAST CORNER OF THE W ½ W ½ SW ¼ OF SAID SECTION 17;

THENCE ALONG SAID SOUTHERLY LINE, BEARING SOUTH 89°50'54" WEST, A DISTANCE OF 326.55 FEET TO A POINT WHICH IS 312.27 FEET EASTERLY FROM THE SOUTHWEST CORNER OF SAID SECTION 17;

THENCE ALONG A LINE BEARING NORTH 0°23'07" WEST, A DISTANCE OF 201.27 FEET; THENCE ALONG A LINE BEARING SOUTH 89°36'53" WEST, A DISTANCE OF 600.00 FEET; THENCE ALONG A LINE BEARING NORTH 0°18'17" WEST, A DISTANCE OF 96.54 FEET; THENCE ALONG A LINE BEARING NORTH 62°43'23" WEST, A DISTANCE OF 81.44 FEET; THENCE ALONG A LINE BEARING SOUTH 84°48'31" WEST, A DISTANCE OF 470.20 FEET; THENCE ALONG A LINE BEARING NORTH 60°55'35" WEST, A DISTANCE OF 280.38 FEET; THENCE ALONG A LINE BEARING NORTH 33°38'41" WEST, A DISTANCE OF 120.04 FEET; THENCE ALONG A LINE BEARING NORTH 17°15'47" WEST, A DISTANCE OF 177.03 FEET;

THENCE ALONG A LINE BEARING NORTH 89°51'05" WEST, A DISTANCE OF 129.37 FEET TO A POINT ON THE WESTERLY LINE OF E ½ SE ¼ OF SAID SECTION 18, WHICH SAID POINT IS A DISTANCE OF 703.84 FEET FROM THE SOUTHWEST CORNER OF SAID E ½ SE ¼ OF SECTION 18;

THENCE ALONG SAID WESTERLY LINE, BEARING NORTH 0°08'55" EAST, A DISTANCE OF 1561.52 FEET TO A POINT ON THE SOUTHEASTERLY LINE OF THE ROCK ISLAND RAILROAD RIGHT OF WAY;

THENCE ALONG SAID SOUTHEASTERLY RIGHT OF WAY LINE, BEARING SOUTH 53°23'46" EAST, A DISTANCE OF 2441.53 FEET TO A POINT ON THE WESTERLY LINE OF IVY STREET, WHICH SAID POINT IS 20.00 FEET WEST OF THE EASTERLY LINE OF THE W ½ W ½ SW ¼ OF SAID SECTION 17;

THENCE ALONG SAID WESTERLY LINE OF IVY STREET, BEARING SOUTH 0°06'34" WEST, A DISTANCE OF 798.94 FEET TO THE POINT OF BEGINNING,

EXCEPT ANY PORTION THEREOF CONVEYED TO THE CITY OF COMMERCE CITY BY DEED RECORDED OCTOBER 29, 1975 IN BOOK 2026 AT PAGE 267 TO WIT:

A TRACT OF LAND LOCATED IN THE COUNTY OF ADAMS, STATE OF COLORADO, SECTION 17, TOWNSHIP 3 SOUTH, RANGE 67 WEST OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE SOUTHERLY LINE OF SAID SECTION 17, A DISTANCE OF 20 FEET WESTERLY FROM THE SOUTHEAST CORNER OF THE WEST ½ WEST ½ SOUTHWEST ¼ OF SAID SECTION 17;

THENCE SOUTH 89°50'54" WEST, A DISTANCE OF 15 FEET;

THENCE NORTH 00°06'34" WEST, A DISTANCE OF 810.12 FEET TO THE SOUTHEASTERLY RIGHT–OF–WAY LINE OF THE ROCK ISLAND RAILROAD;

THENCE ALONG SAID SOUTHEASTERLY RIGHT–OF–WAY LINE, SOUTH 53°23'46" EAST, A DISTANCE OF 18.68 FEET; THENCE SOUTH 00°06'34" EAST, A DISTANCE OF 798.94 FEET TO THE POINT OF BEGINNING,
COUNTY OF ADAMS, STATE OF COLORADO.

PARCEL TWO:

THAT PART OF THE SW ¼ OF SECTION 17, TOWNSHIP 3 SOUTH, RANGE 67 WEST OF THE 6TH P.M., DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHWEST CORNER OF THE SW ¼ OF SAID SECTION 17;

THENCE EAST ALONG THE SOUTH LINE OF SAID SECTION 17, 640 FEET TO THE POINT OF BEGINNING;

THENCE CONTINUING EAST ALONG SAID SOUTH LINE OF SECTION 17, 1075 FEET TO A POINT OF INTERSECTION WITH A LINE PARALLEL TO AND 50 FEET SOUTHWESTERLY OF THE CENTERLINE OF THE MAIN TRACK OF THE COLORADO AND EASTERN RAILROAD AS SAME IS PRESENTLY LAID OUT AND LOCATED;

THENCE NORTHWESTERLY ALONG SAID PARALLEL LINE 50 FEET SOUTHWESTERLY OF SAID MAIN TRACK CENTERLINE, 1360 FEET TO A POINT, SAID POINT BEING THE POINT OF INTERSECTION WITH THE NORTH/SOUTH CENTERLINE OF THE SW ¼ OF THE SW ¼ OF SECTION 17;

THENCE SOUTH ALONG SAID NORTH/SOUTH CENTERLINE TO THE POINT OF BEGINNING,

EXCEPT THAT PORTION CONVEYED TO THE CITY OF COMMERCE CITY BY DEED RECORDED JULY 25, 1966 IN BOOK 1308 AT PAGE 392, COUNTY OF ADAMS, STATE OF COLORADO.

STATEMENT OF POTENTIAL ENCROACHMENTS:

THE ITEMS SHOWN ON THIS TABLE, ARE ALL OF THE POTENTIAL ENCROACHMENTS KNOWN TO THE UNDERSIGNED SURVEYOR.

(A) FENCE NOT ON PROPERTY LINE

(B) PROPERTY CORNER FALLS WITHIN FENCED AREA OCCUPIED BY ADJACENT PROPERTY OWNER

TITLE EXCEPTIONS

9. ANY RIGHT OF WAY OR INTEREST OF THE PUBLIC AND/OR THE CITY OF COMMERCE CITY IN AND TO EAST 48TH AVENUE. (THIS EXCEPTION DOES NOT AFFECT THE SUBJECT PROPERTY. THE AREA IS SHOWN AS A 60' ROW CENTERED ON THE SECTION LINE ALONG E 48TH AND ABUTS THE SUBJECT PROPERTY.)

(10) 10. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE GRANT OF RIGHT OF WAY AS SET FORTH BELOW:
RECORDING DATE: OCTOBER 13, 1911
RECORDING NO.: BOOK 57 AT PAGE 197 (DOES NOT AFFECT THE SUBJECT PROPERTY; PLOTTED, FALLS WITHIN THE RIGHT–OF–WAY OF IVY STREET)

(11) 11. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE RIGHT OF WAY CONTRACT AS SET FORTH BELOW:
RECORDING DATE: JULY 19, 1948
RECORDING NO.: BOOK 321 AT PAGE 84 (AFFECTS THE SUBJECT PROPERTY; THIS EXCEPTION IS BLANKET IN NATURE, BUT ONLY AFFECTS A PORTION OF THE SUBJECT PROPERTY; THE AREA IT IMPACTS HAS BEEN PLOTTED)

(12) 12. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE RIGHT OF WAY CONTRACT AS SET FORTH BELOW:
RECORDING DATE: JULY 19, 1948
RECORDING NO.: BOOK 321 AT PAGE 86 (AFFECTS THE SUBJECT PROPERTY; THIS EXCEPTION IS BLANKET IN NATURE, BUT ONLY AFFECTS A PORTION OF THE SUBJECT PROPERTY; THE AREA IT IMPACTS HAS BEEN PLOTTED)

(13) 13. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE RIGHT OF WAY CONTRACT AS SET FORTH BELOW:
RECORDING DATE: JULY 19, 1946
RECORDING NO.: BOOK 321 AT PAGE 88 (AFFECTS THE SUBJECT PROPERTY; THIS EXCEPTION IS BLANKET IN NATURE, BUT ONLY AFFECTS A PORTION OF THE SUBJECT PROPERTY; THE AREA IT IMPACTS HAS BEEN PLOTTED)

14. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
GRANTED TO: AMERICAN TELEPHONE AND TELEGRAPH COMPANY
PURPOSE: CONSTRUCT, OPERATE AND MAINTAIN TELEPHONE AND TELEGRAPH LINES
RECORDING DATE: JUNE 23, 1933
RECORDING NO: BOOK 209 AT PAGE 599 (AFFECTS THE SUBJECT PROPERTY; BLANKET IN NATURE, NOT PLOTTED)

15. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT: GRANTED TO: AMERICAN TELEPHONE AND TELEGRAPH COMPANY
PURPOSE: CONSTRUCT, OPERATE AND MAINTAIN TELEPHONE AND TELEGRAPH LINES
RECORDING DATE: JUNE 23, 1933
RECORDING NO: BOOK 209 AT PAGE 601 (AFFECTS THE SUBJECT PROPERTY; BLANKET IN NATURE, NOT PLOTTED)

16. ANY TAXES OR ASSESSMENTS BY REASON OF THE INCLUSION OF THE LAND IN THE SOUTH ADAMS COUNTY WATER AND SANITATION DISTRICT, AS EVIDENCED BY INSTRUMENT RECORDED JANUARY 19, 1962 IN BOOK 948 AT PAGE 1. (AFFECTS THE SUBJECT PROPERTY; BLANKET IN NATURE, NOT PLOTTED)

(17) 17. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE EASEMENT AS SET FORTH BELOW:
RECORDING DATE: JULY 25, 1966
RECORDING NO.: BOOK 1308 AT PAGE 394 (AFFECTS THE SUBJECT PROPERTY; PLOTTED)

18. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE AGREEMENT FOR EASEMENT AS SET FORTH BELOW:
RECORDING DATE: AUGUST 9, 1966
RECORDING NO.: BOOK 1311 AT PAGE 294 (AFFECTS THE SUBJECT PROPERTY; BLANKET IN NATURE, NOT PLOTTED)

19. ANY TAXES OR ASSESSMENTS BY REASON OF THE INCLUSION OF THE LAND IN THE INDUSTRIAL PARK WATER AND SANITATION DISTRICT, AS EVIDENCED BY INSTRUMENT RECORDED JUNE 12, 1970 IN BOOK 1605 AT PAGE 93. (AFFECTS THE SUBJECT PROPERTY; BLANKET IN NATURE, NOT PLOTTED)

(20) 20. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE EASEMENT AND RIGHT OF WAY AS SET FORTH BELOW:
RECORDING DATE: NOVEMBER 10, 1972
RECORDING NO.: BOOK 1829 AT PAGE 290 (DOES NOT AFFECT THE SUBJECT PROPERTY; LOCATED WITHIN THE ROW OF 48TH STREET; PLOTTED)

(21) 21. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE EASEMENT AS SET FORTH BELOW:
RECORDING DATE: NOVEMBER 10, 1972
RECORDING NO.: BOOK 1829 AT PAGE 291 (AFFECTS THE SUBJECT PROPERTY; PLOTTED)

22. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE TEMPORARY CONSTRUCTION EASEMENT AS SET FORTH BELOW:
RECORDING DATE: OCTOBER 31, 1975
RECORDING NO.: BOOK 2026 AT PAGE 789 (THIS EASEMENT WOULD AFFECTS THE SUBJECT PROPERTY AND BE PLOTTABLE, BUT IT EXPIRED AFTER IVY STREET WAS COMPLETED)

(23) 23. EASEMENTS AS DISCLOSED AND RESERVED BY QUIT CLAIM DEED AS SET FORTH BELOW:
RECORDING DATE: DECEMBER 20, 1984
RECORDING NO.: BOOK 2949 AT PAGE 320 (DOES NOT AFFECT THE SUBJECT PROPERTY; THIS EASEMENT FALLS WITHIN RAILROAD RIGHT–OF–WAY; PLOTTED)

(24) 24. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE SLOPE/DRAINAGE EASEMENT AS SET FORTH BELOW:
RECORDING DATE: OCTOBER 7, 1994
RECORDING NO.: BOOK 4403 AT PAGE 909 (AFFECTS THE SUBJECT PROPERTY; PLOTTED)

(25) 25. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE EMERGENCY ACCESS EASEMENT AS SET FORTH BELOW:
RECORDING DATE: NOVEMBER 4, 1994
RECORDING NO.: BOOK 4419 AT PAGE 757 (AFFECTS THE SUBJECT PROPERTY; PLOTTED)

26. RESERVATIONS, RESTRICTIONS, COVENANTS, EXCEPTIONS, NOTIFICATIONS, CONDITIONS, AGREEMENT AND EASEMENTS AS SET FORTH, GRANTED AND RESERVED IN QUIT CLAIM DEED BY AND BETWEEN UNITED STATES OF AMERICA, ACTING BY AND THROUGH THE ADMINISTRATOR OF GENERAL SERVICES ADMINISTRATION, AND 48TH AND HOLLY, L.L.C., A COLORADO LIMITED LIABILITY COMPANY AS SET FORTH BELOW:
RECORDING DATE: NOVEMBER 21, 2006
RECORDING NO.: RECEPTION NO. 2006001002970 (AFFECTS THE SUBJECT PROPERTY; BLANKET IN NATURE, NOT PLOTTED)

27. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE ENVIRONMENTAL COVENANT AS SET FORTH BELOW:
RECORDING DATE: JULY 2, 2007
RECORDING NO.: RECEPTION NO. 2007000063610
RE–RECORDING DATE: APRIL 21, 2008
RE–RECORDING NO.: RECEPTION NO. 2008000031499

NOTE: AFFIDAVIT RE: SCRIVNER'S ERROR IN CONNECTION THEREWITH RECORDED AUGUST 27, 2007 AT RECEPTION NO. 2007000081946. (AFFECTS THE SUBJECT PROPERTY; BLANKET IN NATURE NOT PLOTTED)

28. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE ASSIGNMENT OF RIGHTS OF WAY, EASEMENTS, PERMITS AND LICENSES AS SET FORTH BELOW:
RECORDING DATE: NOVEMBER 24, 2008
RECORDING NO.: RECEPTION NO. 2008000092304 (AFFECTS THE SUBJECT PROPERTY; BLANKET IN NATURE NOT PLOTTED)

29. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE NON–FEE PROPERTY ASSIGNMENT AND CONVEYANCE AGREEMENT AS SET FORTH BELOW:
RECORDING DATE: DECEMBER 3, 2013
RECORDING NO.: RECEPTION NO. 2013000101602 (MAY AFFECT THE SUBJECT PROPERTY. TWO LOCATIONS IN THIS DOCUMENT REFERENCE THE SECTION 18, T3S, R67W AS THE IMPACTED AREA. THE SUBJECT PROPERTY IS A PORTION OF THE EAST 1/2 OF THE SE 1/4 OF SECTION 18, T3S, R67W. BECAUSE THE EXACT LOCATION OF THE RIGHTS TRANSFERRED IS NOT SPECIFIED THIS DOCUMENT MAY IMPACT THE SUBJECT PROPERTY; BLANKET IN NATURE, NOT PLOTTED)

GENERAL NOTES

1. NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU DISCOVER SUCH DEFECT. IN NO EVENT MAY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE CERTIFICATION SHOWN HEREON.

2. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY WILSON AND COMPANY TO DETERMINE TITLE OR EASEMENTS OF RECORD. RESEARCH FOR THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH CRS 38–51–106 AND THE RULES OF PROCEDURE AND BOARD POLICY STATEMENTS OF THE STATE BOARD OF LICENSURE FOR PROFESSIONAL ENGINEERS AND PROFESSIONAL LAND SURVEYORS, SPECIFICALLY THOSE BOARD RULES AND POLICY STATEMENTS RELATING TO THE DEPICTION OF EASEMENTS AND RIGHTS OF WAY ON SUBDIVISION PLATS. TITLE COMMITMENT NUMBER CCHI2003177NT REV 10/19/20, DATED OCTOBER 2, 2020, PREPARED BY CHICAGO TITLE INSURANCE COMPANY WAS RELIED UPON FOR ALL INFORMATION REGARDING EASEMENTS OF RECORD, RIGHTS OF WAY, TITLE OF RECORD AND CIVIL COURT ACTIONS OF RECORD.

3. THE PROPERTY SURVEYED IS THE SAME PROPERTY AS DESCRIBED IN THE TITLE COMMITMENT, PREPARED BY CHICAGO TITLE INSURANCE COMPANY NCS NUMBER CCHI2003177NT, LOCAL OFFICE NUMBER 100–N0028281–010–TO2

4. BASIS OF BEARINGS: BEARINGS USED HEREIN ARE BASED ON SOUTHWEST LINE OF SECTION 18, TOWNSHIP 3 SOUTH, RANGE 67W., BEING N89°28'38"E USING ADAMS COUNTY CONTROL NETWORK, AS MONUMENTED AT THE SE CORNER OF SECTION 18 WITH A FOUND 3.25" ALUM ILLEGIBLE. AND MONUMENTED AT SOUTH 1/4 CORNER OF SECTION 17 WITH A FOUND 2.5" ALUM ILLEGIBLE.

5. THE SUBJECT PROPERTY IS LOCATED WITHIN ZONE X, DEFINED AS "AREAS DETERMINED TO BE OUTSIDE 500 YEAR FLOOD PLAIN", AS SHOWN ON FLOOD INSURANCE RATE MAP (FIRM), MAP NUMBER 08001C0616H, REVISED MARCH 5, 2007.

6. PROJECT BENCHMARK: COUNTY OF ADAMS BENCHMARK 95.0240, BEING AN ADAMS COUNTY 3.25" ALUMINUM CAP, IN RANGE BOX AT THE INTERSECTION OF IVY ST AND E. 48TH AVE. HAVING AN ELEVATION OF 5251.18 FEET (NAVD 88).

7. SITE BENCHMARKS WERE ESTABLISHED FOR THIS SITE AS DETAILED BELOW.

   SITE B.M. NO.1: ADAMS COUNTY 3.25" ALUMINUM CAP, IN RANGE BOX AT THE INTERSECTION OF IVY ST AND E. 48TH AVE. HAVING AN ELEVATION OF 5251.18 FEET (NAVD 88).

   SITE B.M. NO.2: FOUND GREEN PLASTIC CAP, LS 38320 AT THE SOUTHWEST CORNER OF SUBJECT PROPERTY LOT 9 HAVING AN ELEVATION OF 5234.83'.

8. PER THE CITY OF COMMERCE CITY ZONING GIS, THE SUBJECT PROPERTY IS ZONED I–3–HEAVY INTENSITY INDUSTRIAL DISTRICT.

9. TO THE BEST OF MY KNOWLEDGE, THERE ARE NO PROPOSED CHANGES IN STREET RIGHTS–OF–WAY AFFECTING THE SUBJECT PROPERTY, AND, EXCEPT AS NOTED, THERE VISIBLE EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.

10. A VISUAL INSPECTION OF THE SITE INDICATED THAT THE SITE WAS PREVIOUSLY USED AS A LANDFILL. THE CONTENTS OF THAT LANDFILL ARE UNKNOWN.

11. A VISUAL INSPECTION OF THE SITE INDICATED NO EVIDENCE OF EARTH MOVING, BUILDING CONSTRUCTION OR BUILDING REPAIRS.

12. A VISUAL INSPECTION OF THE SITE OBSERVED NO WETLAND DELINEATION MARKS.

13. MANY OF THE MONITORING & TESTING WELLS DEPICTED ON THIS PROPERTY WERE LOCKED AND COULD NOT BE OPENED DURING THE SURVEY. THE ELEVATION SHOWS IS THE TOP OF THE EXTERIOR OF THE HOUSING STRUCTURE.

14. THE SUBJECT PROPERTY HAS ACCESS TO FOREST STREET AND 48TH AVENUE, BOTH DEDICATED PUBLIC RIGHTS–OF–WAY.

VICINITY MAP
NOT TO SCALE

SURVEYOR'S CERTIFICATE:

TO: 48TH & HOLLY, LLC, A COLORADO LIMITED LIABILITY COMPANY; CHICAGO TITLE INSURANCE COMPANY;

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1–5, 8, 11, 13, 16, 17, 19 AND 20 OF TABLE A THEREOF.

THE FIELDWORK WAS COMPLETED ON 8–27–2020

DATE OF PLAT OR MAP: 8–31–2020

DOUGLAS H, ORT III , PLS 37066
THIS SURVEY IS VALID ONLY IF PRINT HAS ORIGINAL SEAL AND SIGNATURE OF SURVEYOR.

20–300–095

NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
01	CLIENT COMMENTS	DHO	10/14		

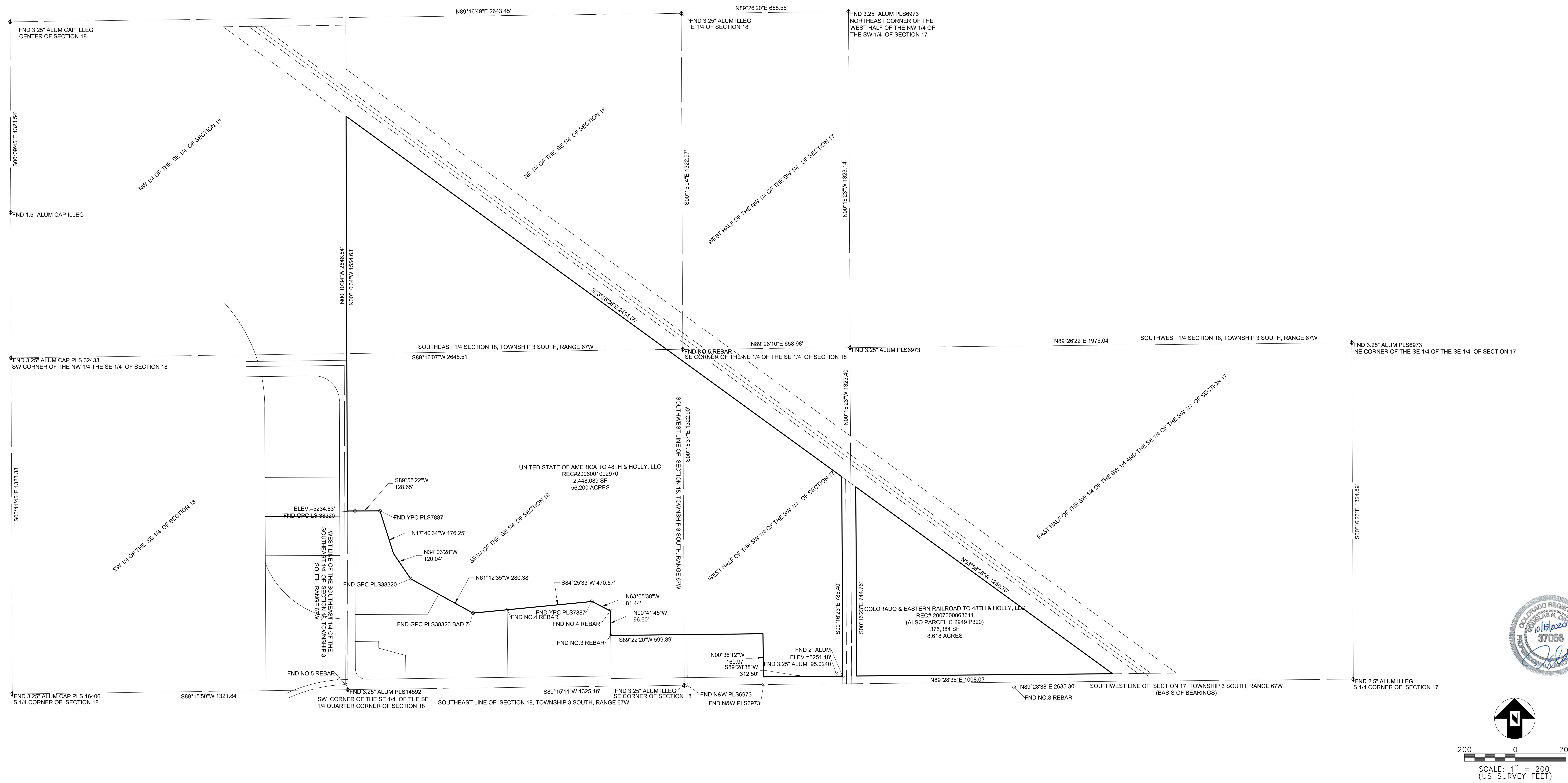
SHT. NO.: 1 OF 3	SCALE: N/A
DWN. BY: TJB	DATE: 7-30-2020
CHK. BY:	
PROJ. MGR: DHO	7-30-2020
CLIENT APP:	

WILSON & COMPANY
1675 Broadway Suite 200
Denver, CO 80202
Phone: 303-297-2976
Fax: 303-297-2693

ALTA/NSPS LAND TITLE SURVEY FOR 48TH & HOLLY ADAMS COUNTY STATE OF COLORADO

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 18, AND THE SOUTHWEST QUARTER OF SECTION 17, TOWNSHIP 3 SOUTH, RANGE 67 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, ADAMS COUNTY, STATE OF COLORADO



20-300-095

NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
01	CLIENT COMMENTS	DHO	10/14		

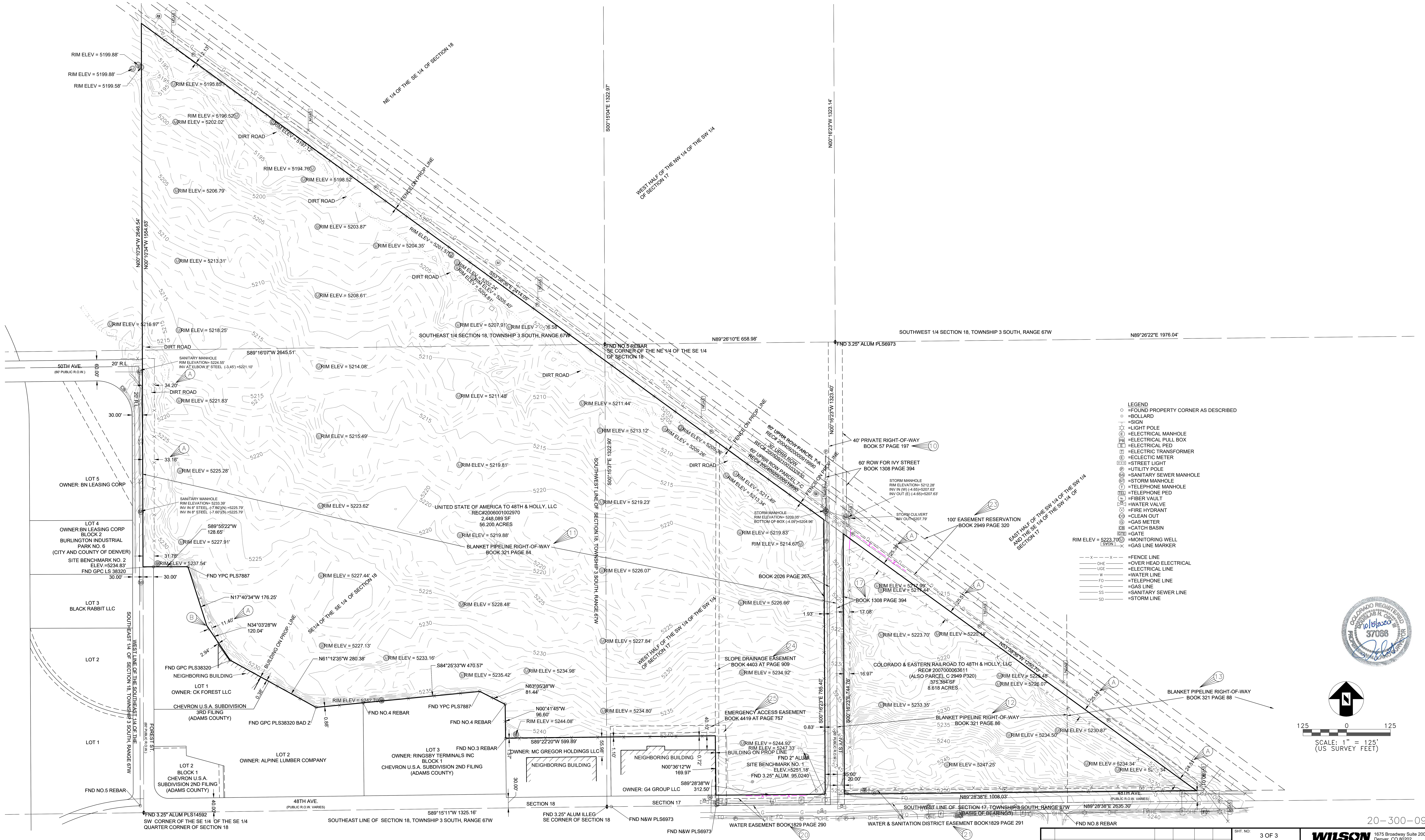
SHT. NO: 2 OF 3
SCALE: 1"=200'
DWN. BY: TJB — DATE: 07-30-2020
CHK. BY:
PROJ. MGR: DHO — 07-30-2020
CLIENT APP:

WILSON & COMPANY
1675 Broadway Suite 200
Denver, CO 80202
Phone: 303-297-2976
Fax: 303-297-2693

ALTA/NSPS LAND TITLE SURVEY
FOR
48TH & HOLLY
ADAMS COUNTY
STATE OF COLORADO

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 18, AND THE SOUTHWEST QUARTER OF SECTION 17, TOWNSHIP 3 SOUTH, RANGE 67 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, ADAMS COUNTY, STATE OF COLORADO



20-300-095

NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D
01	CLIENT COMMENTS	DHO	10/14		

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ALTA/NSPS LAND TITLE SURVEY FOR 48TH & HOLLY ADAMS COUNTY STATE OF COLORADO

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 3 SOUTH, RANGE 67 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, & LOTS 4 & 5, BLOCK 2, BURLINGTON INDUSTRIAL PARK NO. 6
CITY AND COUNTY OF DENVER,
STATE OF COLORADO.

LEGAL DESCRIPTION

PARCEL ONE AND TWO ARE NOT PART OF THIS SURVEY

PARCEL THREE:

ALL THAT PORTION OF THE NW ¼ SE ¼ OF SECTION 18, TOWNSHIP 3 SOUTH, RANGE 67 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY AND COUNTY OF DENVER, STATE OF COLORADO, DESCRIBED AS FOLLOWS, TO WIT:

COMMENCING AT THE NORTHEAST CORNER OF SAID W ½ SE ¼ OF SECTION 18;

THENCE SOUTHERLY ALONG THE EAST LINE OF SAID W ½ SE ¼ OF SECTION 18 FOR A DISTANCE OF 387.67 FEET TO THE POINT OF BEGINNING OF THE PARCEL TO BE DESCRIBED.

THENCE CONTINUING SOUTHERLY ALONG SAID EAST LINE OF THE W ½ SE ¼ OF SECTION 18 FOR A DISTANCE OF 961.70 FEET TO THE INTERSECTION WITH THE NORTH LINE OF 50TH AVENUE, ACCORDING TO THE RECORDED PLAT THEREOF;

THENCE WESTERLY ALONG SAID NORTH LINE OF 50TH AVENUE FOR A DISTANCE OF 351.45 FEET TO THE INTERSECTION WITH THE NORTHEASTERLY LINE OF BURLINGTON NORTHERN RAILROAD COMPANY'S RIGHT OF WAY, SAID NORTHEASTERLY RIGHT OF WAY LINE BEING A LINE DRAWN PARALLEL WITH AND DISTANT 37.5 FEET NORTHEASTERLY OF, AS MEASURED RADIALLY TO, SAID RAILROAD COMPANY'S MAIN TRACT CENTERLINE;

THENCE NORTHWESTERLY PARALLEL WITH SAID MAIN TRACK CENTERLINE ALONG A CURVE TO THE LEFT WITH A RADIUS OF 611.96 FEET FOR AN ARC DISTANCE OF 449.75 FEET TO A POINT OF TANGENCY;

THENCE CONTINUING NORTHEASTERLY IN A STRAIGHT LINE PARALLEL WITH SAID MAIN TRACT CENTERLINE FOR A DISTANCE OF 746.38 FEET TO THE INTERSECTION WITH THE EAST LINE OF DAHLIA STREET, ACCORDING TO THE RECORDED PLAT THEREOF;

THENCE NORTHERLY ALONG SAID EAST LINE OF DAHLIA STREET FOR A DISTANCE OF 582.75 FEET TO THE INTERSECTION WITH THE NORTH LINE OF SAID W ½ SE ¼ OF SECTION 18;

THENCE EASTERLY ALONG SAID NORTH LINE FOR A DISTANCE OF 781.23 FEET;

THENCE SOUTHEASTERLY IN A STRAIGHT LINE TO THE ORIGINAL POINT OF BEGINNING,

EXCLUDING THOSE PORTIONS LYING NORTHEAST OF THE SOUTHWEST LINE OF THE RIGHT OF WAY FOR THE ROCK ISLAND PACIFIC RAILROAD, AND EXCEPT THAT PORTION LYING EAST OF THE EAST RIGHT OF WAY LINE OF DAHLIA STREET, AND

EXCEPT THAT PORTION LYING NORTH OF THE SOUTH RIGHT OF WAY LINE FOR 52ND AVENUE, AND EXCEPT THAT PORTION PLATTED AS BURLINGTON INDUSTRIAL PARK NO. 6 ACCORDING TO THE PLAT THEREOF RECORDED APRIL 21,1975 IN PLAT BOOK 27 AT PAGE 94,

CITY AND COUNTY OF DENVER,

STATE OF COLORADO.

PARCEL FOUR:

LOT 5, BLOCK 2, BURLINGTON INDUSTRIAL PARK NO. 6
CITY AND COUNTY OF DENVER,
STATE OF COLORADO.

PARCEL FIVE:

LOT 4, BLOCK 2, BURLINGTON INDUSTRIAL PARK NO. 6
CITY AND COUNTY OF DENVER,
STATE OF COLORADO.

TITLE EXCEPTIONS

EXCEPTIONS 9-30 AFFECT PARCEL ONE AND TWO WHICH ARE NOT PART OF THIS SURVEY
THE FOLLOWING AFFECT PARCEL THREE:

31. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE RIGHT OF WAY
EASEMENT AS GRANTED TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY AS SET FORTH BELOW:

RECORDING DATE: DECEMBER 16, 1927
RECORDING NO.: BOOK 163 AT PAGE 270 (ADAMS COUNTY RECORDS) (BLANKET IN NATURE; NOT PLOTTED)

32. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE EASEMENT AS
GRANTED TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY AS SET FORTH BELOW:

RECORDING DATE: JUNE 23, 1933
RECORDING NO.: BOOK 209 AT PAGE 601 (ADAMS COUNTY RECORDS) (DOS NOT AFFECT SUBJECT PROPERTY; BLANKET IN NATURE NOT PLOTTED)

33. THE EFFECT OF SURVEY RECORDED NOVEMBER 9, 1950 IN BOOK 407 AT PAGE 235. (ADAMS COUNTY RECORDS) (BLANKET IN NATURE; NOT PLOTTED)

34. ANY TAXES OR ASSESSMENTS BY REASON OF THE INCLUSION OF THE LAND IN THE SOUTH ADAMS COUNTY WATER AND SANITATION DISTRICT, AS EVIDENCED BY INSTRUMENT AS SET FORTH BELOW:

RECORDING DATE: SEPTEMBER 20, 1951
RECORDING NO.: BOOK 427 AT PAGE 548 (ADAMS COUNTY RECORDS) (BLANKET IN NATURE; NOT PLOTTED)

TITLE EXCEPTIONS CONTINUED

EXCEPTIONS 9-30 AFFECT PARCEL ONE AND TWO WHICH ARE NOT PART OF THIS SURVEY
THE FOLLOWING AFFECT PARCEL THREE:

(35) 35. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
GRANTED TO: CITY AND COUNTY OF DENVER
PURPOSE: SEWER
RECORDING DATE: DECEMBER 4, 1953
RECORDING NO: BOOK 7401 AT PAGE 1 AFFECTS PARCELS 3 & 4 (PLOTTED)

36. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE ORDINANCE AS SET FORTH BELOW:
RECORDING DATE: JANUARY 17, 1980
RECORDING NO.: RECEPTION NO. 48466 (BLANKET IN NATURE; NOT PLOTTED)

(37) 37. THE EFFECT OF SURVEY RECORDED JULY 15, 1986 AT RECEPTION NO. 663189. (ADAMS COUNTY RECORDS) (PLOTTED)

38. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE NOTICE AS SET FORTH BELOW:
RECORDING DATE: APRIL 2, 1990
RECORDING NO.: RECEPTION NO. 936082 (ADAMS COUNTY RECORDS) (AFFECTS ENTIRE PARCEL, BLANKET IN NATURE NOT PLOTTED)

39. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE UNILATERAL ADMINISTRATIVE
ORDER FOR REMEDIAL DESIGN/REMEDIAL ACTION AS SET FORTH BELOW:
RECORDING DATE: FEBRUARY 14, 1994
RECORDING NO.: RECEPTION NO. 9400027856 (AFFECTS ENTIRE PARCEL, BLANKET IN NATURE; NOT PLOTTED)

(40) 40. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE MEMORANDUM OF
EASEMENT AS SET FORTH BELOW:
RECORDING DATE: AUGUST 14, 1996
RECORDING NO.: RECEPTION NO. 96000113597 AFFECTS PARCEL 3 (PLOTTED)

41. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, EASEMENTS AND OBLIGATIONS CONTAINED IN THE EASEMENT AS
GRANTED TO PHILLIPS PETROLEUM AS DISCLOSED BY ASSIGNMENT OF RIGHTS OF WAY, EASEMENT, PERMITS AND
LICENSES AS SET FORTH BELOW:
RECORDING DATE: NOVEMBER 24, 2008
RECORDING NO.: RECEPTION NO. 2008000092304 (ADAMS COUNTY RECORDS) (BLANKET IN NATURE; NOT PLOTTED)

THE FOLLOWING AFFECT PARCELS FOUR AND FIVE:

42. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
GRANTED TO: CITY AND COUNTY OF DENVER
PURPOSE: SEWER
RECORDING DATE: DECEMBER 4, 1953
RECORDING NO: BOOK 7401 AT PAGE 1 (AFFECTS PARCEL 3 PLOTTED AS EXCEPTION 35)

(43) 43. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
GRANTED TO: CITY AND COUNTY OF DENVER
PURPOSE: SEWER
RECORDING DATE: SEPTEMBER 13, 1954
RECORDING NO: BOOK 7536 AT PAGE 80 (PLOTTED)

44. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
GRANTED TO: CITY AND COUNTY OF DENVER
PURPOSE: SEWER
RECORDING DATE: DECEMBER 1, 1971
RECORDING NO: RECEPTION NO. 42868 (BLANKET IN NATURE; NOT PLOTTED)

(45) 45. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
GRANTED TO: CITY AND COUNTY OF DENVER
PURPOSE: SEWER
RECORDING DATE: DECEMBER 9, 1977
RECORDING NO: RECEPTION NO. 86094 (PLOTTED)

46. RESERVATION OF A RAILROAD EASEMENT, INCLUDING THE RIGHT, PRIVILEGE AND EASEMENT TO CONSTRUCT, MAINTAIN, REPAIR, RENEW, USE, OPERATE OVER, REPLACE OR REMOVE RAILROAD TRACKS, DRAINAGE FACILITIES AND APPURTENANCE THERETO AS RESERVED IN CORRECTION QUIT CLAIM DEED, RECEPTION NO. 87459, RECORDED ON SEPTEMBER 20, 1990. (DOS NOT AFFECT SUBJECT PROPERTY, BLANKET IN NATURE NOT PLOTTED)

(47) 47. EASEMENTS AND RIGHTS OF WAY AS SHOWN ON PLAT MAP RECORDED ON APRIL 21, 1975 AT 27/94.

NOTE: QUIT CLAIM DEEDS RECORDED ON JUNE 2, 1978 AT RECEPTION NO. 64524 AND OCTOBER 22, 1985 AT RECEPTION
NO. 1081988 EXTINGUISH PRIOR DEDICATED EASEMENTS.(PLOTTED)

AREA OF INTEREST:

(A) FENCE NOT ON PROPERTY LINE

GENERAL NOTES

1. NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU DISCOVER SUCH DEFECT. IN NO EVENT MAY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE CERTIFICATION SHOWN HEREON.

2. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY WILSON AND COMPANY TO DETERMINE TITLE OR EASEMENTS OF RECORD. RESEARCH FOR THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH CRS 38-51-106 AND THE RULES OF PROCEDURE AND BOARD POLICY STATEMENTS OF THE STATE BOARD OF LICENSURE FOR PROFESSIONAL ENGINEERS AND PROFESSIONAL LAND SURVEYORS, SPECIFICALLY THOSE BOARD RULES AND POLICY STATEMENTS RELATING TO THE DEPICTION OF EASEMENTS AND RIGHTS OF WAY ON SUBDIVISION PLATS. TITLE COMMITMENT NUMBER CCHI2003177NT DATED FEBRUARY 01, 2022, PREPARED BY CHICAGO TITLE INSURANCE COMPANY WAS RELIED UPON FOR ALL INFORMATION REGARDING EASEMENTS OF RECORD, RIGHTS OF WAY, TITLE OF RECORD AND CIVIL COURT ACTIONS OF RECORD.

3. BASIS OF BEARINGS: BEARINGS USED HEREIN ARE BASED ON SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 3 SOUTH, RANGE 67W., BEING S89°15'11"E USING ADAMS COUNTY CONTROL NETWORK, AS MONUMENTED AT THE SE CORNER OF SECTION 18 WITH A FOUND 3.25" ALUM ILLEGIBLE. AND MONUMENTED AT SW CORNER OF THE SE 1/4 OF SECTION 18 WITH A FOUND 3.5" PLS 14592.

4. THE SUBJECT PROPERTY IS LOCATED WITHIN ZONE X, DEFINED AS "AREAS DETERMINED TO BE OUTSIDE 500 YEAR FLOOD PLAIN", AS SHOWN ON FLOOD INSURANCE RATE MAP (FIRM), MAP NUMBER 0800460091H, REVISED NOVEMBER 20, 2013.

5. PROJECT BENCHMARK: COUNTY OF ADAMS BENCHMARK 95.0240, BEING AN ADAMS COUNTY 3.25" ALUMINUM CAP, IN RANGE BOX AT THE INTERSECTION OF IVY ST AND E. 48TH AVE. HAVING AN ELEVATION OF 5251.18 FEET (NAVD 88).

6. SITE BENCHMARKS WERE ESTABLISHED FOR THIS SITE AS DETAILED BELOW.

SITE B.M. NO.1: ADAMS COUNTY 3.25" ALUMINUM CAP, IN RANGE BOX AT THE INTERSECTION OF IVY ST AND E. 48TH AVE. HAVING AN ELEVATION OF 5251.18 FEET (NAVD 88).

SITE B.M. NO.2: FOUND GREEN PLASTIC CAP, LS 38320 AT THE SOUTHWEST CORNER OF SUBJECT PROPERTY LOT 9 HAVING AN ELEVATION OF 5234.83'.

7. PER THE CITY AND COUNTY OF DENVER ZONING, THE SUBJECT PROPERTY IS ZONED I-B, UO-2 (INDUSTRIAL - GENERAL (I-B))

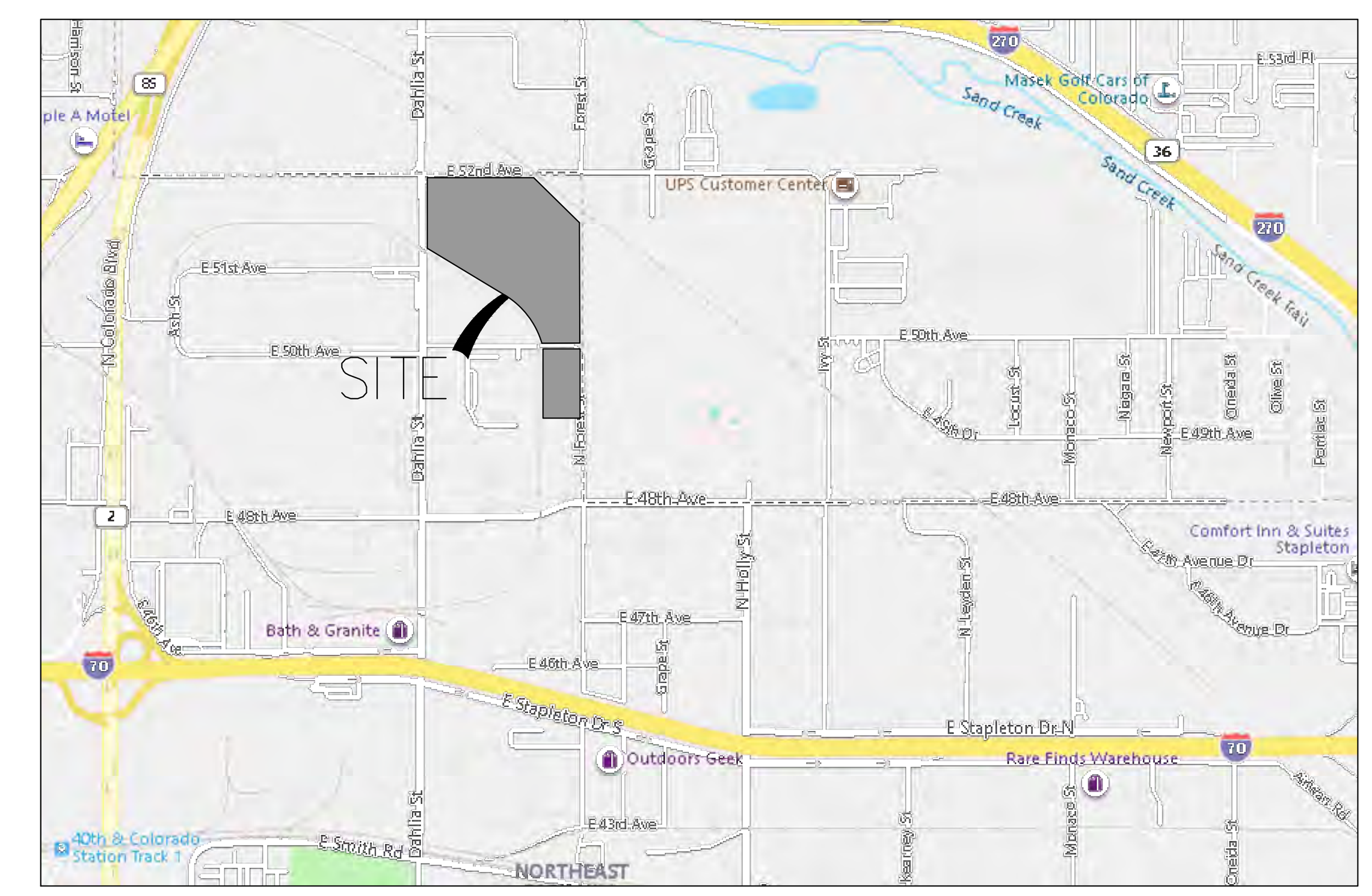
9. TO THE BEST OF MY KNOWLEDGE, THERE ARE NO PROPOSED CHANGES IN STREET RIGHTS-OF-WAY AFFECTING THE SUBJECT PROPERTY, AND, EXCEPT AS NOTED, THERE VISIBLE EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.

10. A VISUAL INSPECTION OF THE SITE INDICATED THAT THE SITE WAS PREVIOUSLY USED AS A LANDFILL. THE CONTENTS OF THAT LANDFILL ARE UNKNOWN.

11. A VISUAL INSPECTION OF THE SITE INDICATED NO EVIDENCE OF EARTH MOVING, BUILDING CONSTRUCTION OR BUILDING REPAIRS.

12. A VISUAL INSPECTION OF THE SITE OBSERVED NO WETLAND DELINEATION MARKS.

MANY OF THE MONITORING & TESTING WELLS DEPICTED ON THIS PROPERTY WERE LOCKED AND COULD NOT BE OPENED DURING THE SURVEY.



VICINITY MAP
NOT TO SCALE

SURVEYOR'S CERTIFICATE:

TO: 48TH & HOLLY, LLC, A COLORADO LIMITED LIABILITY COMPANY; CA INDUSTRIAL HOLDINGS, LLC, A DELAWARE LIMITED LIABILITY COMPANY, BNSF RAILWAY COMPANY, A DELAWARE CORPORATION, BN LEASING CORPORATION, A DELAWARE CORPORATION, AND CHICAGO TITLE INSURANCE COMPANY;

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1-5, 8, 11(B), 13, 16-18 AND 19 OF TABLE A THEREOF.

THE FIELDWORK WAS COMPLETED ON 03-08-2022
DATE OF PLAT OR MAP: 03-09-2022

MICHAEL J. LINDQUIST, PLS 38666
THIS SURVEY IS VALID ONLY IF PRINT HAS ORIGINAL SEAL AND SIGNATURE OF SURVEYOR.

21-300-219

NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D

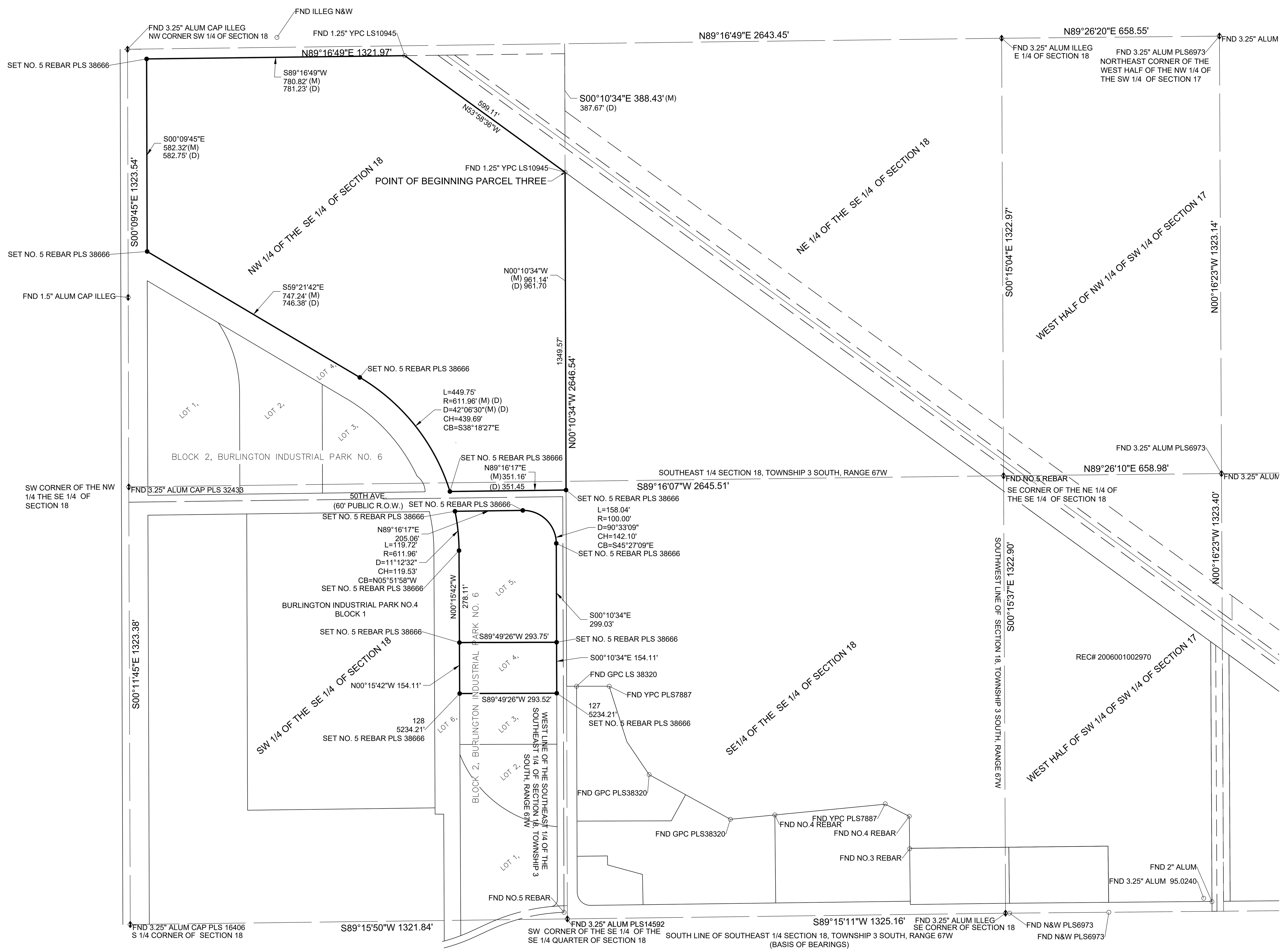
SHT. NO.: 1 OF 3	
SCALE: N/A	
DWN. BY: TJB	DATE: 03-02-2022
CHK. BY:	
PROJ. MGR.: MJL	03-02-2022
CLIENT APP.:	

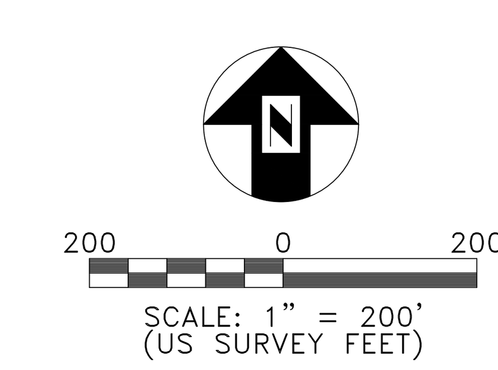
WILSON &COMPANY
1675 Broadway Suite 200
Denver, CO 80202
Phone: 303-297-2976
Fax: 303-297-2693

ALTA/NSPS LAND TITLE SURVEY
FOR
52ND & DAHLIA
CITY & COUNTY OF DENVER
STATE OF COLORADO

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 3 SOUTH, RANGE 67 WEST, OF THE SIXTH PRINCIPAL MERIDIAN, & LOTS 4 & 5, BLOCK 2, BURLINGTON INDUSTRIAL PARK NO. 6
CITY AND COUNTY OF DENVER,
STATE OF COLORADO.





21-300-219

NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D

SHT. NO: 2 OF 3	**WILSON &COMPANY** 1675 Broadway Suite 200 Denver, CO 80202 Phone: 303-297-2976 Fax: 303-297-2693
SCALE: 1"=200'	
DWN. BY: TJB — DATE: 03-02-2022	ALTA/NSPS LAND TITLE SURVEY FOR 52ND & DAHLIA CITY & COUNTY OF DENVER STATE OF COLORADO
CHK. BY:	
PROJ. MGR: MJL — 03-02-2022	
CLIENT APP:	

ALTA/NSPS LAND TITLE SURVEY

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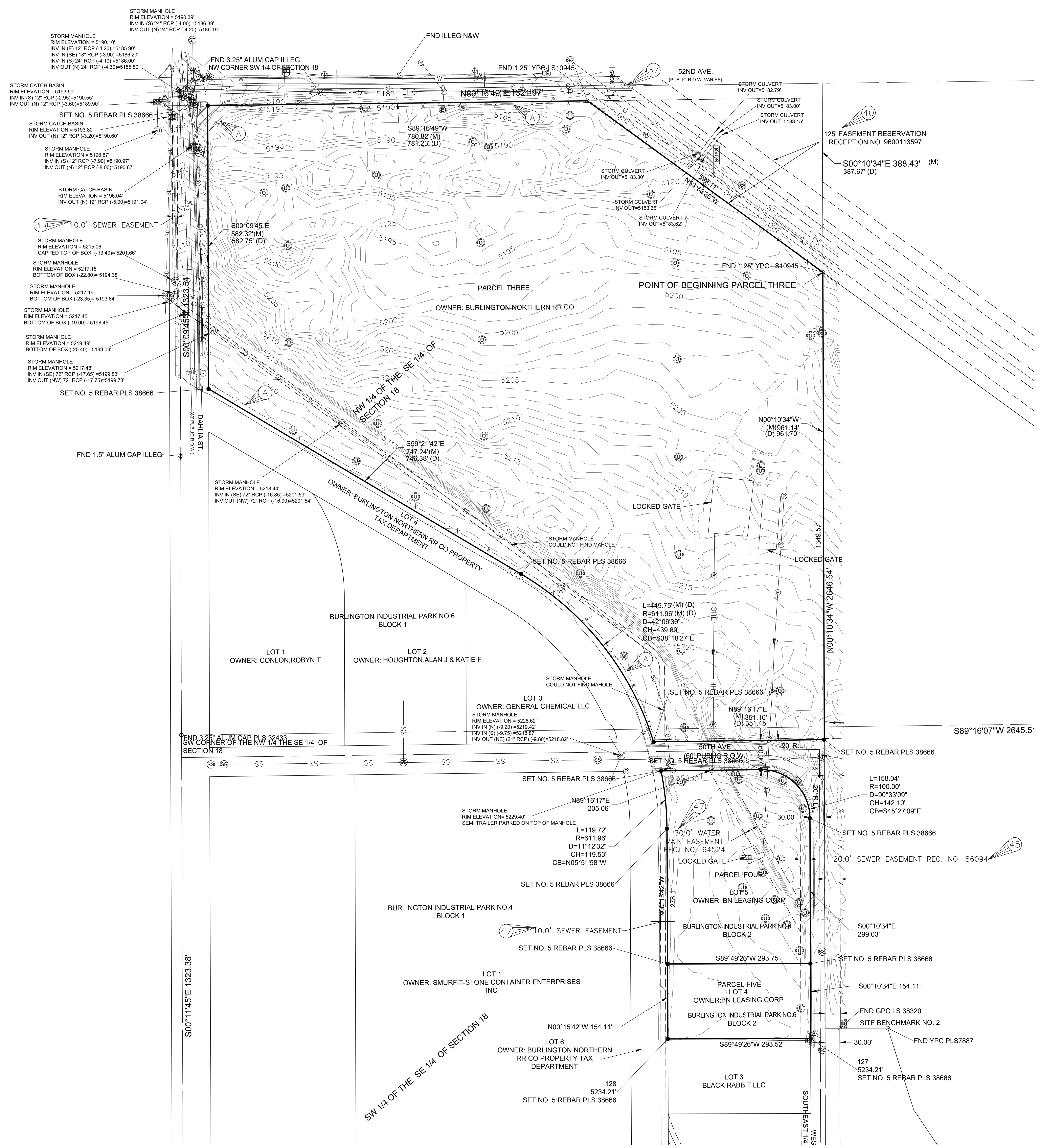

LEGEND
- =FOUND PROPERTY CORNER AS DESCRIBED
- =BOLLARD
- =SIGN
- =LIGHT POLE
- =ELECTRICAL MANHOLE
- =ELECTRICAL PULL BOX
- =ELECTRICAL PED
- =ELECTRIC TRANSFORMER
- =ECLECTIC METER
- =STREET LIGHT
- =UTILITY POLE
- =SANITARY SEWER MANHOLE
- =STORM MANHOLE
- =TELEPHONE MANHOLE
- =TELEPHONE PED
- =FIBER VAULT
- =WATER VALVE
- =FIRE HYDRANT
- =CLEAN OUT
- =GAS METER
- =CATCH BASIN
- =GATE
- =MONITORING WELL
- =GAS LINE MARKER
- =FENCE LINE
- =OVER HEAD ELECTRICAL
- =ELECTRICAL LINE
- =WATER LINE
- =TELEPHONE LINE
- =GAS LINE
- =SANITARY SEWER LINE
- =STORM LINE

125 0 125
SCALE: 1" = 125'
(US SURVEY FEET)

21-300-219

NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D

SHT. NO: 3 OF 3
SCALE: 1"=125'
DWN. BY: TJB DATE: 03-02-2022
CHK. BY:
PROJ. MGR: MJL 03-02-2022
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ALTA/NSPS LAND TITLE SURVEY
FOR
52ND & DAHLIA
CITY & COUNTY OF DENVER
STATE OF COLORADO

Appendix 5 – Compilation of Institutional Controls for the Property

Notice of Environmental Use Restriction: Sand Creek

This property is subject to a Notice of Environmental Use Restrictions imposed by the Colorado Department of Public Health and Environment pursuant to § 25-15-321.5, Colorado Revised Statutes

NOTICE OF ENVIRONMENTAL USE RESTRICTIONS

WHEREAS, Triangle Logistics Center, LLC ("Triangle") is the owner of certain property that is a portion of the property commonly referred to as the Former 48th and Holly Landfill, located at 48th and Holly Streets, Commerce City, Colorado 80216, Adams County Parcel Number 0182317300008, more particularly described in Attachment A and depicted in Attachment B attached hereto and incorporated herein by reference as though fully set forth (hereinafter, "the Property"); and

WHEREAS, the Hazardous Materials and Waste Management Division of the Colorado Department of Public Health and the Environment ("the Department"), located at 4300 Cherry Creek Drive South, Denver, Colorado 80246-1530, is authorized to approve Notices of Environmental Use Restrictions (a/k/a/ "Restrictive Notices") pursuant to § 25-15-320(4)(a) of the Colorado Hazardous Waste Act, §§ 25-15-101, *et seq*.; and

WHEREAS, Triangle and the Department have agreed that the Department should releaseand terminate the Environmental Covenant for the Property, recorded with the Adams County Clerk and Recorder on January 11, 2007 (the "Environmental Covenant") (Reception No.
2007000004490), and replace it with this Notice of Environmental Use Restrictions; and

WHEREAS, the Release and Termination of the Environmental Covenant is being executed concurrently with this Notice of Environmental Use Restrictions; and

WHEREAS, for purposes of indexing in the County Clerk and Recorder's office Grantor-Grantee index only, Triangle shall be considered the **Grantor**, and the Department shall be considered the **Grantee**. Nothing in the preceding sentence shall be construed to create or transfer any right, title or interest in the Property; and

WHEREAS, pursuant to Sand Creek Industrial Superfund Site Record of Decision for OU3, dated June 30, 1993, the Record of Decision for OU4, dated April 7, 1994, and the Record of Decision for OU6, incorporated in the June 30, 1993 Record of Decision for OU3, dated June 30 1994, the Property is the subject of enforcement and remedial action pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601, *et seq*. ("CERCLA"); and

WHEREAS, the purpose of this Restrictive Notice is to ensure protection of human health and the environment by allowing for development of the Property that will not adversely affect the operation and maintenance of the remedy components for OU3, OU4 and OU6 and to add certain parties, including the United States Environmental Protection Agency ("EPA"), as third-party beneficiaries; and

WHEREAS, such remedy components consist of (i) continued operation of the landfill's soil cover system and landfill gas extraction system ("LFGES") with improvements as required; (ii) continued maintenance of the area's perimeter fence and warning signs; (iii) continuation of the existing institutional controls and implementation of additional institutional controls as necessary; and (iv) implementation of a monitoring program for groundwater and methane gas and periodic site reviews ("Remedial Components"); and

WHEREAS, Triangle desires to subject the Property to certain covenants and restrictionsas provided in Article 15 of Title 25, Colorado Revised Statutes, which covenants and restrictions shall burden the Property and bind the Triangle and all parties now or subsequently having any right, title or interest in the Property, or any part thereof, and any persons using the land, as described herein, for the benefit of the Department and the EPA.

NOW, THEREFORE, Triangle and the Department agree to this Restrictive Notice, with EPA as a third party beneficiary, and declare that the Property as described in Attachment A shall hereinafter be bound by, held, sold, and conveyed subject to the following requirements set forth in paragraphs 1 through 14, below, which shall run with the Property in perpetuity and be binding on the Triangle and all parties now or subsequently having any right, title or interest in the Property, or any part thereof, and any persons using the land, as described herein. As used in this Restrictive Notice, the term OWNER means the then current record owner of the Property and, if any, any other person or entity otherwise legally authorized to make decisions regarding the transfer of the Property or placement of encumbrances on the Property, other than by the exercise of eminent domain.

1. <u>Activity restrictions.</u>

   a. Due to the presence of methane gas at levels dangerous to human health and the environment, and to protect the proper functioning of the LFGES and soil cover system, all activities that will affect Remedial Components must be approved by CDPHE or EPA. Therefore, no activity of any kind that will affect Remedial Components is allowed on the Property other than activities done in accordance with:
      i. Remedial plans approved by EPA in consultation with the Department;
      ii. A Materials Management Plan approved by the Department in consultation with EPA; or
      iii. Other construction or redevelopment plans or designs approved by the Department and EPA for any construction or redevelopment that may impact the Remedial Components or potentially exacerbate the migration of contaminants.

   b. For purposes of this paragraph 1, and without limiting the foregoing, activities, designs, and systems approved pursuant to that certain Administrative Settlement Agreement for Response Actions and Payment of Response Costs by Prospective Purchaser ("PPA") entered into among Triangle, EPA, and the State of Colorado, CERCLA Docket No. [XXX] ("Remedial Decision Document") are allowed on the Property.

   c. Without limiting the foregoing, no enclosed structures may be built on the Property without a properly designed and constructed vapor intrusion mitigation system approved by the Department that is designed to prevent airborne concentrations of

methane gas within the structure from exceeding concentrations specified in the Remedial Decision Document. Once constructed the mitigation system must be operated and maintained as specified in the Department's approval of the system to prevent indoor concentrations of methane from exceeding such concentrations.

2. Modifications. This Restrictive Notice shall remain in full force and effect unless modified or terminated pursuant to this paragraph. OWNER may request that the Department approve a modification or termination of the Restrictive Notice. The request shall contain information showing that the proposed modification or termination shall, if implemented, ensure protection of human health and the environment. The Department shall review any submitted information, and may request additional information. If the Department determines that the proposal to modify or terminate the Restrictive Notice will ensure protection of human health and the environment, it shall approve the proposal. No modification or termination of this Restrictive Notice shall be effective unless the Department has approved such modification or termination in writing. Information to support a request for modification or termination may include one or more of the following:

    a. a proposal to perform additional remedial work;
    b. new information regarding the risks posed by the residual contamination;
    c. information demonstrating that residual contamination has diminished;
    d. information demonstrating that an engineered feature or structure is no longer necessary;
    e. information demonstrating that the proposed modification would not adversely impact the remedy and is protective of human health and the environment; and
    f. other appropriate supporting information.

3. Conveyances. OWNER shall notify the Department at least fifteen (15) days in advance of the closing on any proposed sale or other conveyance of any interest in any or all of the Property. Within thirty (30) days after any such conveyance, OWNER shall provide the Department with the name, mailing address and telephone number of the new OWNER.

4. Notice to Lessees. OWNER agrees to incorporate either in full or by reference the restrictions of this Restrictive Notice in any leases, licenses, or other instruments granting a right to use the Property.

5. Notification for proposed construction and land use. OWNER shall notify the Department simultaneously when submitting any application to a local government for a building permit or change in land use.

6. Inspections. The Department, including its authorized employees, agents, representatives and independent contractors, shall have the right of entry to the Property at reasonable times with prior notice for the purpose of determining compliance with the terms of this Restrictive Notice.

7. Third Party Beneficiaries. EPA and the District (as defined below) are third party beneficiaries with the right to enforce the provisions of this Restrictive Notice as provided in § 25-15-322, C.R.S.

8. No Liability. The Department does not acquire any liability under State law by virtue of accepting this Restrictive Notice nor does any other named beneficiary of this Restrictive Notice acquire any liability under State law by virtue of being such a beneficiary.

9. Enforcement. The Department may enforce the terms of this Restrictive Notice pursuant to § 25-15-322, C.R.S. against OWNER and any named beneficiaries of this Restrictive Notice and may file suit in district court to enjoin actual or threatened violations of this Restrictive Notice.

10. Owner's Compliance Certification. OWNER shall execute and return a certification form provided by the Department, on an annual basis, detailing OWNER's compliance, and any lack of compliance, with the terms of this Restrictive Notice ("Certification of Compliance").

11. Severability. If any part of this Restrictive Notice shall be decreed to be invalid by any court of competent jurisdiction, all of the other provisions hereof shall not be affected thereby and shall remain in full force and effect.

12. Notices. Any document or communication required under this Restrictive Notice shall be sent or directed to:

    Sand Creek NPL Site Project Manager
    Hazardous Materials and Waste Management Division
    Colorado Department of Public Health and the Environment
    4300 Cherry Creek Drive South
    Denver, Colorado 80246-1530

    Remedial Project Manager
    Sand Creek NPL Site
    U.S. EPA, Region 8
    1595 Wynkoop Street
    Denver, CO 80202-1129

13. Subdivision of Property. Payment of annual fees, if applicable, and Certification of Compliance with the restrictions set forth in paragraph (1) of this Restrictive Notice shall be the responsibility of OWNER or, upon written notice to the Department, the TRIANGLE LOGISTICS CENTER COMMERCIAL METROPOLITAN DISTRICT, a quasi-governmental entity formed pursuant to §§ 31-1-101 *et seq.*, C.R.S. ("District"), or a property owner's association ("POA") formed under Colorado law. Nothing in this paragraph relieves OWNER of the obligation to comply with the requirements of this paragraph if the District or such POA is unable to fulfill any if the responsibilities it assumes on behalf of OWNER pursuant to this paragraph. The OWNER may submit an alternative plan addressing payment of annual fees and certification of compliance with the restrictions set forth in paragraph (1) of this Restrictive Notice. The Department shall approve the plan if it determines that the plan reasonably will ensure continued compliance with the requirements of this Restrictive Notice. Any Department notice of disapproval shall include the Department's rationale for its decision, including any additional information or changes to the plan that the Department requires before the plan can be approved. Any appeal of a Department notice of disapproval shall be taken in accordance with section 25-15-305(2), C.R.S.

Triangle Logistics Center, LLC has caused this instrument to be executed this_____day of _____, 2022.

BY:

_____

Triangle Logistics Center, LLC,
a Delaware limited liability company
Name: Michael Podboy
Its: Authorized Signatory

STATE OF_____)
) ss:
COUNTY OF_____)

The foregoing instrument was acknowledged before me this_____day of_____, 2022 on behalf of Triangle Logistics Center, LLC.

_____
Notary Public

_____
Address

_____

My commission expires: _____

Accepted by the Colorado Department of Public Health and Environment this____day of _____, 2022.

By:_____

Title: _____

STATE OF_____)
) ss:
COUNTY OF_____)

The foregoing instrument was acknowledged before me this_____day of_____, 2022 on behalf of the Colorado Department of Public Health and Environment.

_____
Notary Public

_____
Address

My commission expires: _____

ATTACHMENT "A"
to the
RESTRICTIVE NOTICE: LEGAL DESCRIPTION

A tract of land situate in the County of Adams, State of Colorado, Sections 17 and 18, Township 3 South, Range 67 West of the 6th P.M., more particularly described as follows:

Beginning at a point on the Southerly line of said Section 17, a distance of 20.00 feet Westerly from the Southeast corner of the W ½ W ½ SW ¼ of said Section 17;

Thence along said Southerly line, bearing South 89º50'54" West, a distance of 326.55 feet to a point which is 312.27 feet Easterly from the Southwest corner of said Section 17;

Thence along a line bearing North 0º23'07" West, a distance of 201.27 feet;
Thence along a line bearing South 89º36'53" West, a distance of 600.00 feet;
Thence along a line bearing North 0º18'17" West, a distance of 96.54 feet;
Thence along a line bearing North 62º43'23" West, a distance of 81.44 feet;
Thence along a line bearing South 84º48'31" West, a distance of 470.20 feet;
Thence along a line bearing North 60º55'35" West, a distance of 280.38 feet;
Thence along a line bearing North 33º38'41" West, a distance of 120.04 feet;
Thence along a line bearing North 17º15'47" West, a distance of 177.03 feet;

Thence along a line bearing North 89º51'05" West, a distance of 129.37 feet to a point on the Westerly line of E ½ SE ¼ of said Section 18, which said point is a distance of 703.84 feet from the Southwest corner of said E ½ SE ¼ of Section 18;

Thence along said Westerly line, bearing North 0º08'55" East, a distance of 1561.52 feet to a point on the Southeasterly line of the Rock Island Railroad Right of Way;

Thence along said Southeasterly Right of Way line, bearing South 53º23'46" East, a distance of 2441.53 feet to a point on the Westerly line of Ivy Street, which said point is 20.00 feet West of the Easterly line of the W ½ W ½ SW ¼ of said Section 17;

Thence along said Westerly line of Ivy Street, bearing South 0º06'34" West, a distance of 798.94 feet to the Point of Beginning,

EXCEPT any portion thereof conveyed to the City of Commerce City by Deed recorded October 29, 1975 in Book 2026 at Page 267 to wit:

A tract of land located in the County of Adams, State of Colorado, Section 17, Township 3 South, Range 67 West of the 6th P.M., more particularly described as follows:

Beginning at a point on the Southerly line of said Section 17, a distance of 20 feet Westerly from the Southeast corner of the West ½ West ½ Southwest ¼ of said Section 17;

Thence South 89º50'54" West, a distance of 15 feet;

Thence North 00º06’34” West, a distance of 810.12 feet to the Southeasterly right-of-way line of the Rock Island Railroad;

Thence along said Southeasterly right-of-way line, South 53º23’46” East, a distance of 18.68 feet; Thence South 00º06’34” East, a distance of 798.94 feet to the Point of Beginning, County of Adams, Colorado

ATTACHMENT "B"
to the
RESTRICTIVE NOTICE: MAP

Notice of Environmental Use Restriction: Sand Creek

This property is subject to a Notice of Environmental Use Restrictions imposed by the Colorado Department of Public Health and Environment pursuant to § 25-15-321.5, Colorado Revised Statutes

NOTICE OF ENVIRONMENTAL USE RESTRICTIONS

WHEREAS, Triangle Logistics Center, LLC ("Triangle"), is the owner of certain property that is a portion of the property commonly referred to as the Former 48th and Holly Landfill, located at 48th and Holly Streets, Commerce City, Colorado 80216, Adams County Parcel Number 0182317300029, more particularly described in Attachment A and depicted in Attachment B, attached hereto and incorporated herein by reference as though fully set forth (hereinafter, "the Property"); and

WHEREAS, the Hazardous Materials and Waste Management Division of the Colorado Department of Public Health and the Environment ("the Department"), located at 4300 Cherry Creek Drive South, Denver, Colorado 80246-1530, is authorized to approve Notices of Environmental Use Restrictions (a/k/a/ "Restrictive Notices") pursuant to § 25-15-320(4)(a) of the Colorado Hazardous Waste Act § 25-15-101, *et seq*.; and

WHEREAS, Triangle and the Department have agreed that the Department should release and terminate the Environmental Covenant for the Property dated July 2, 2007 (Reception No. 2007000063610), re-recorded on April 21, 2008 (Reception No. 2008000031499), and replace it with this Notice of Environmental Use Restrictions; and

WHEREAS, the Release and Termination of the Environmental Covenant is being executed concurrently with this Notice of Environmental Use Restrictions; and

WHEREAS, for purposes of indexing in the County Clerk and Recorder's office Grantor-Grantee index only, Triangle shall be considered the **Grantor**, and the Department shall be considered the **Grantee**. Nothing in the preceding sentence shall be construed to create or transfer any right, title or interest in the Property; and

WHEREAS, pursuant to Sand Creek Industrial Superfund Site Record of Decision for OU3, dated June 30, 1993, the Record of Decision for OU4, dated April 7, 1994, and the Record of Decision for OU6, incorporated in the June 30, 1993 Record of Decision for OU3, dated June 30 1994, the Property is the subject of enforcement and remedial action pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § § 9601, *et seq*. ("CERCLA"); and

WHEREAS, the purpose of this Restrictive Notice is to ensure protection of human health and the environment by allowing for development of the Property that will not adversely affect the operation and maintenance of the remedy components for OU3, OU4 and OU6 and to add certain parties, including the United States Environmental Protection Agency ("EPA"), as third-party beneficiaries; and

WHEREAS, such remedy components consist of (i) continued operation of the landfill's soil cover system and landfill gas extraction system ("LFGES") with improvements as required;

(ii) continued maintenance of the area's perimeter fence and warning signs; (iii) continuation of the existing institutional controls and implementation of additional institutional controls as necessary; and (iv) implementation of a monitoring program for groundwater and methane gas and periodic site reviews ("Remedial Components"); and

WHEREAS, Triangle desires to subject the Property to certain covenants and restrictionsas provided in Article 15 of Title 25, Colorado Revised Statutes, which covenants and restrictions shall burden the Property and bind the Triangle and all parties now or subsequently having any right, title or interest in the Property, or any part thereof, and any persons using the land, as described herein, for the benefit of the Department and EPA.

NOW, THEREFORE, Triangle and the Department agree to this Restrictive Notice, with EPA as a third party beneficiary, and declare that the Property as described in Attachment A shall hereinafter be bound by, held, sold, and conveyed subject to the following requirements set forth in paragraphs 1 through 14, below, which shall run with the Property in perpetuity and be binding on Triangle and all parties now or subsequently having any right, title or interest in the Property, or any part thereof, and any persons using the land, as described herein. As used in this Restrictive Notice, the term OWNER means the then current record owner of the Property and, if any, any other person or entity otherwise legally authorized to make decisions regarding the transfer of the Property or placement of encumbrances on the Property, other than by the exercise of eminent domain.

1. Activity restrictions.

    a. Due to the presence of methane gas at levels dangerous to human health and the environment, and to protect the proper functioning of the LFGES and soil cover system, all activities that will affect Remedial Components must be approved by CDPHE or EPA. Therefore, no activity of any kind that will affect Remedial Components is allowed on the Property other than activities done in accordance with:
        i. Remedial plans approved by EPA in consultation with the Department;
        ii. A Materials Management Plan approved by the Department in consultation with EPA; or
        iii. Other construction or redevelopment plans or designs approved by the Department and EPA for any construction or redevelopment that may impact the Remedial Components or potentially exacerbate the migration of contaminants.

    b. For purposes of this paragraph 1, and without limiting the foregoing, activities, designs, and systems approved pursuant to that certain Administrative Settlement Agreement for Response Actions and Payment of Response Costs by Prospective Purchaser ("PPA")

entered into among Triangle, EPA, and the State of Colorado, CERCLA Docket No. [XXX] ("Remedial Decision Document"), are allowed on the Property.

c. Without limiting the foregoing, no enclosed structures may be built on the Property without a properly designed and constructed vapor intrusion mitigation system approved by the Department that is designed to prevent airborne concentrations of methane gas within the structure from exceeding concentrations specified in the Remedial Decision Document. Once constructed, the mitigation system must be operated and maintained as specified in the Department's approval of the system to prevent indoor concentrations of methane from exceeding such concentrations.

3. Modifications. This Restrictive Notice shall remain in full force and effect unless modified or terminated pursuant to this paragraph. OWNER may request that the Department approve a modification or termination of the Restrictive Notice. The request shall contain information showing that the proposed modification or termination shall, if implemented, ensure protection of human health and the environment. The Department shall review any submitted information, and may request additional information. If the Department determines that the proposal to modify or terminate the Restrictive Notice will ensure protection of human health and the environment, it shall approve the proposal. No modification or termination of this Restrictive Notice shall be effective unless the Department has approved such modification or termination in writing. Information to support a request for modification or termination may include one or more of the following:

   a. a proposal to perform additional remedial work;
   b. new information regarding the risks posed by the residual contamination;
   c. information demonstrating that residual contamination has diminished;
   d. information demonstrating that an engineered feature or structure is no longer necessary;
   e. information demonstrating that the proposed modification would not adversely impact the remedy and is protective of human health and the environment; and
   f. other appropriate supporting information.

4. Conveyances. OWNER shall notify the Department at least fifteen (15) days in advance of the closing on any proposed sale or other conveyance of any interest in any or all of the Property. Within thirty (30) days after any such conveyance, OWNER shall provide the Department with the name, mailing address and telephone number of the new OWNER.

5. Notice to Lessees. OWNER agrees to incorporate either in full or by reference the restrictions of this Restrictive Notice in any leases, licenses, or other instruments granting a right to use the Property.

6. Notification for proposed construction and land use. OWNER shall notify the Department simultaneously when submitting any application to a local government for a building permit or change in land use.

7. Inspections. The Department, including its authorized employees, agents, representatives and independent contractors, shall have the right of entry to the Property at reasonable times with

prior notice for the purpose of determining compliance with the terms of this Restrictive Notice.

8. Third Party Beneficiaries. EPA and the District (as defined below) are third party beneficiaries with the right to enforce the provisions of this Restrictive Notice as provided in § 25-15-322, C.R.S.

9. No Liability. The Department does not acquire any liability under State law by virtue of accepting this Restrictive Notice nor does any other named beneficiary of this Restrictive Notice acquire any liability under State law by virtue of being such a beneficiary.

10. Enforcement. The Department may enforce the terms of this Restrictive Notice pursuant to § 25-15-322, C.R.S. against OWNER and any named beneficiaries of this Restrictive Notice and may file suit in district court to enjoin actual or threatened violations of this Restrictive Notice.

11. Owner's Compliance Certification. OWNER shall execute and return a certification form provided by the Department, on an annual basis, detailing OWNER's compliance, and any lack of compliance, with the terms of this Restrictive Notice ("Certification of Compliance").

12. Severability. If any part of this Restrictive Notice shall be decreed to be invalid by any court of competent jurisdiction, all of the other provisions hereof shall not be affected thereby and shall remain in full force and effect.

13. Notices. Any document or communication required under this Restrictive Notice shall be sent or directed to:

    Sand Creek NPL Site Project Manager
    Hazardous Materials and Waste Management Division
    Colorado Department of Public Health and the Environment
    4300 Cherry Creek Drive South
    Denver, Colorado 80246-1530

    Remedial Project Manager
    Sand Creek NPL Site
    U.S. EPA, Region 8
    1595 Wynkoop Street
    Denver, CO 80202-1129

14. Subdivision of Property. Payment of annual fees, if applicable, and Certification of Compliance with the restrictions set forth in paragraph (1) of this Restrictive Notice shall be the responsibility of OWNER or, upon written notice to the Department, the TRIANGLE LOGISTICS CENTER COMMERCIAL METROPOLITAN DISTRICT, a quasi-governmental entity formed pursuant to §§ 31-1-101 *et seq.*, C.R.S. ("District") or a property owner's association ("POA") formed under Colorado law. Nothing in this paragraph relieves OWNER of the obligation to comply with the requirements of this paragraph if the District or such POA is unable to fulfill any if the responsibilities it assumes on behalf of OWNER pursuant to this paragraph. The OWNER may submit an alternative plan addressing payment

of annual fees and certification of compliance with the restrictions set forth in paragraph (1) of this Restrictive Notice. The Department shall approve the plan if it determines that the plan reasonably will ensure continued compliance with the requirements of this Restrictive Notice. Any Department notice of disapproval shall include the Department's rationale for its decision, including any additional information or changes to the plan that the Department requires before the plan can be approved. Any appeal of a Department notice of disapproval shall be taken in accordance with § 25-15-305(2), C.R.S.

Triangle Logistics Center, LLC has caused this instrument to be executed this_____day of _____, 2022.

BY:

_____

Triangle Logistics Center, LLC,
a Delaware limited liability company
Name: Michael Podboy
Its: Authorized Signatory

STATE OF _____)
) ss:
COUNTY OF_____)

The foregoing instrument was acknowledged before me this_____day of_____, 2022 on behalf of Triangle Logistics Center, LLC.

_____
Notary Public

_____
Address

My commission expires: _____

Accepted by the Colorado Department of Public Health and Environment this____day of _____, 2022.

By:_____

Title: _____

STATE OF_____)
) ss:
COUNTY OF_____)

The foregoing instrument was acknowledged before me this_____day of_____, 2022 on behalf of the Colorado Department of Public Health and Environment.

_____
Notary Public

_____
Address

My commission expires: _____

ATTACHMENT "A"
to the
RESTRICTIVE NOTICE: LEGAL DESCRIPTION

That part of the SW ¼ of Section 17, Township 3 South, Range 67 West of the 6th P.M., described as follows:

Commencing at the Southwest corner of the SW ¼ of said Section 17;

Thence East along the South line of said Section 17, 640 feet to the Point of Beginning;

Thence continuing East along said South line of Section 17, 1075 feet to a point of intersection with a line parallel to and 50 feet Southwesterly of the centerline of the main track of the Colorado and Eastern Railroad as same is presently laid out and located;

Thence Northwesterly along said parallel line 50 feet Southwesterly of said main track centerline, 1360 feet to a point, said point being the point of intersection with the North/South centerline of the SW ¼ of the SW ¼ of Section 17;

Thence South along said North/South centerline to the Point of Beginning,

EXCEPT that portion conveyed to the City of Commerce City by Deed recorded July 25, 1966 in Book 1308 at Page 392,

County of Adams, State of Colorado.

Notice of Environmental Use Restriction: Sand Creek

This property is subject to a Notice of Environmental Use Restrictions imposed by the Colorado Department of Public Health and Environment pursuant to § 25-15-321.5, Colorado Revised Statutes

NOTICE OF ENVIRONMENTAL USE RESTRICTIONS

WHEREAS, Triangle Logistics Center, LLC ("Triangle"), is the owner of certain property that is a portion of the property commonly referred to as the Former 48th and Holly Landfill, located at 48th and Holly Streets, Commerce City, Colorado 80216, Denver County Parcel Numbers 0118400014000 and 0118401008000, more particularly described in Attachment A and depicted in Attachment B, attached hereto and incorporated herein by reference as though fully set forth (hereinafter, "the Property"); and

WHEREAS, the Hazardous Materials and Waste Management Division of the Colorado Department of Public Health and the Environment ("the Department"), located at 4300 Cherry Creek Drive South, Denver, Colorado 80246-1530, is authorized to issue and terminate Environmental Covenants pursuant to § 25-15-321(2) of the Colorado Hazardous Waste Act, § 2515-101, *et seq*. and to approve Notices of Environmental Use Restrictions (a/k/a/ "Restrictive Notices") pursuant to § 25-15-320(4)(a) of the Colorado Hazardous Waste Act; and

WHEREAS, for purposes of indexing in the County Clerk and Recorder's office Grantor-Grantee index only, Triangle shall be considered the **Grantor**, and the Department shall be considered the **Grantee**. Nothing in the preceding sentence shall be construed to create or transfer any right, title or interest in the Property; and

WHEREAS, pursuant to Sand Creek Industrial Superfund Site Record of Decision for OU3, dated June 30, 1993, the Record of Decision for OU4, dated April 7, 1994, and the Record of Decision for OU6, incorporated in the June 30, 1993 Record of Decision for OU3, dated June 30 1994, the Property is the subject of enforcement and remedial action pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § § 9601, *et seq*. ("CERCLA"); and

WHEREAS, the purpose of this Restrictive Notice is to ensure protection of human health and the environment by allowing for development of the Property that will not adversely affect the operation and maintenance of the remedy components for OU3, OU4 and OU6 and to add certain parties, including the United States Environmental Protection Agency ("EPA"), as third-party beneficiaries; and

WHEREAS, such remedy components consist of (i) continued operation of the landfill's soil cover system and landfill gas extraction system ("LFGES") with improvements as required; (ii) continued maintenance of the area's perimeter fence and warning signs; (iii) continuation of the existing institutional controls and implementation of additional institutional controls as necessary; and (iv) implementation of a monitoring program for groundwater and methane gas and periodic site reviews ("Remedial Components"); and

WHEREAS, Triangle desires to subject the Property to certain covenants and restrictionsas provided in Article 15 of Title 25, Colorado Revised Statutes, which covenants and restrictions shall burden the Property and bind Triangle and all parties now or subsequently having any right, title or interest in the Property, or any part thereof, and any persons using the land, as described herein, for the benefit of the Department and EPA.

NOW, THEREFORE, Trinagle and the Department agree to this Restrictive Notice, with EPA as a third party beneficiary, and declare that the Property as described in Attachment A shall hereinafter be bound by, held, sold, and conveyed subject to the following requirements set forth in paragraphs 1 through 13, below, which shall run with the Property in perpetuity and be binding on Triangle and all parties now or subsequently having any right, title or interest in the Property, or any part thereof, and any persons using the land, as described herein. As used in this Restrictive Notice, the term OWNER means the then current record owner of the Property and, if any, any other person or entity otherwise legally authorized to make decisions regarding the transfer of the Property or placement of encumbrances on the Property, other than by the exercise of eminent domain.

1. Activity restrictions.

a. Due to the presence of methane gas at levels dangerous to human health and the environment, and to protect the proper functioning of the LFGES and soil cover system, all activities that will affect Remedial Components must be approved by CDPHE or EPA. Therefore, no activity of any kind that will affect Remedial Components is allowed on the Property other than activities done in accordance with:
   i. Remedial plans approved by EPA in consultation with the Department;
   ii. A Materials Management Plan approved by the Department in consultation with EPA; or
   iii. Other construction or redevelopment plans or designs approved by the Department and EPA for any construction or redevelopment that may impact the Remedial Components or potentially exacerbate the migration of contaminants.

b. For purposes of this paragraph 1, and without limiting the foregoing, activities, designs, and systems approved pursuant to that certain Administrative Settlement Agreement for Response Actions and Payment of Response Costs by Prospective Purchaser ("PPA") entered into among Triangle, EPA, and the State of Colorado, CERCLA Docket No. [XXX] ("Remedial Decision Document") are allowed on the Property.

c. Without limiting the foregoing, no enclosed structures may be built on the Property without a properly designed and constructed vapor intrusion mitigation system approved by the Department that is designed to prevent airborne concentrations of methane gas within the structure from exceeding concentrations specified in the Remedial Decision Document. Once constructed the mitigation system must be operated and maintained as specified in the Department's approval of the system to prevent indoor concentrations of methane from exceeding such concentrations.

2. Modifications. This Restrictive Notice shall remain in full force and effect unless modified or terminated pursuant to this paragraph. OWNER may request that the Department approve a modification or termination of the Restrictive Notice. The request shall contain information showing that the proposed modification or termination shall, if implemented, ensure protection of human health and the environment. The Department shall review any submitted information, and may request additional information. If the Department determines that the proposal to modify or terminate the Restrictive Notice will ensure protection of human health and the environment, it shall approve the proposal. No modification or termination of this Restrictive Notice shall be effective unless the Department has approved such modification or termination in writing. Information to support a request for modification or termination may include one or more of the following:

    a. a proposal to perform additional remedial work;
    b. new information regarding the risks posed by the residual contamination;
    c. information demonstrating that residual contamination has diminished;
    d. information demonstrating that an engineered feature or structure is no longer necessary;
    e. information demonstrating that the proposed modification would not adversely impact the remedy and is protective of human health and the environment; and
    f. other appropriate supporting information.

3. Conveyances. OWNER shall notify the Department at least fifteen (15) days in advance of the closing on any proposed sale or other conveyance of any interest in any or all of the Property. Within thirty (30) days after any such conveyance, OWNER shall provide the Department with the name, mailing address and telephone number of the new OWNER.

4. Notice to Lessees. OWNER agrees to incorporate either in full or by reference the restrictions of this Restrictive Notice in any leases, licenses, or other instruments granting a right to use the Property.

5. Notification for proposed construction and land use. OWNER shall notify the Department simultaneously when submitting any application to a local government for a building permit or change in land use.

6. Inspections. The Department, including its authorized employees, agents, representatives and independent contractors, shall have the right of entry to the Property at reasonable times with prior notice for the purpose of determining compliance with the terms of this Restrictive Notice.

7. Third Party Beneficiaries. EPA and the District (as defined below) are third party beneficiaries with the right to enforce the provisions of this Restrictive Notice as provided in § 25-15-322, C.R.S.

8. No Liability. The Department does not acquire any liability under State law by virtue of accepting this Restrictive Notice nor does any other named beneficiary of this Restrictive Notice acquire any liability under State law by virtue of being such a beneficiary.

9. Enforcement. The Department may enforce the terms of this Restrictive Notice pursuant to § 25-15-322, C.R.S. against OWNER and any named beneficiaries of this Restrictive Notice

and may file suit in district court to enjoin actual or threatened violations of this Restrictive Notice.

10. Owner's Compliance Certification. OWNER shall execute and return a certification form provided by the Department, on an annual basis, detailing OWNER's compliance, and any lack of compliance, with the terms of this Restrictive Notice ("Certification of Compliance").

11. Severability. If any part of this Restrictive Notice shall be decreed to be invalid by any court of competent jurisdiction, all of the other provisions hereof shall not be affected thereby and shall remain in full force and effect.

12. Notices. Any document or communication required under this Restrictive Notice shall be sent or directed to:

    Sand Creek NPL Site Project Manager
    Hazardous Materials and Waste Management Division
    Colorado Department of Public Health and the Environment
    4300 Cherry Creek Drive South
    Denver, Colorado 80246-1530

    Remedial Project Manager
    Sand Creek NPL Site
    U.S. EPA, Region 8
    1595 Wynkoop Street
    Denver, CO 80202-1129

13. Subdivision of Property. Payment of annual fees, if applicable, and Certification of Compliance with the restrictions set forth in paragraph (1) of this Restrictive Notice shall be the responsibility of OWNER or, upon written notice to the Department, the TRIANGLE LOGISTICS CENTER COMMERCIAL METROPOLITAN DISTRICT, a quasi-governmental entity formed pursuant to §§31-1-101 *et seq.*, C.R.S. ("District"), or a property owner's association ("POA") formed under Colorado law. Nothing in this paragraph relieves OWNER of the obligation to comply with the requirements of this paragraph if the District or such POA is unable to fulfill any if the responsibilities it assumes on behalf of OWNER pursuant to this paragraph. The OWNER may submit an alternative plan addressing payment of annual fees and certification of compliance with the restrictions set forth in paragraph (1) of this Restrictive Notice. The Department shall approve the plan if it determines that the plan reasonably will ensure continued compliance with the requirements of this Restrictive Notice. Any Department notice of disapproval shall include the Department's rationale for its decision, including any additional information or changes to the plan that the Department requires before the plan can be approved. Any appeal of a Department notice of disapproval shall be taken in accordance with § 25-15-305(2), C.R.S.

Triangle Logistics Center, LLC has caused this instrument to be executed this_____day of _____, 2022.

BY:

_____

Triangle Logistics Center, LLC,
a Delaware limited liability company
Name: Michael Podboy
Its: Authorized Signatory

STATE OF _____)
) ss:
COUNTY OF_____)

The foregoing instrument was acknowledged before me this_____day of_____, 2022 on behalf of Triangle Logistics Center, LLC.

_____
Notary Public

_____
Address

My commission expires: _____

Accepted by the Colorado Department of Public Health and Environment this_____day of _____, 2022.

By:_____

Title: _____

STATE OF_____)
) ss
COUNTY OF_____)

The foregoing instrument was acknowledged before me this_____day of_____, 2022 on behalf of the Colorado Department of Public Health and Environment.

_____
Notary Public

_____
Address

My commission expires: _____

ATTACHMENT "A"
to the
RESTRICTIVE NOTICE: LEGAL DESCRIPTION

A tract of land situate in the County of Adams, State of Colorado, Sections 17 and 18, Township 3 South, Range 67 West of the 6th P.M., more particularly described as follows:

Beginning at a point on the Southerly line of said Section 17, a distance of 20.00 feet Westerly from the Southeast corner of the W ½ W ½ SW ¼ of said Section 17;

Thence along said Southerly line, bearing South 89º50'54" West, a distance of 326.55 feet to a point which is 312.27 feet Easterly from the Southwest corner of said Section 17;

Thence along a line bearing North 0º23'07" West, a distance of 201.27 feet;
Thence along a line bearing South 89º36'53" West, a distance of 600.00 feet;
Thence along a line bearing North 0º18'17" West, a distance of 96.54 feet;
Thence along a line bearing North 62º43'23" West, a distance of 81.44 feet;
Thence along a line bearing South 84º48'31" West, a distance of 470.20 feet;
Thence along a line bearing North 60º55'35" West, a distance of 280.38 feet;
Thence along a line bearing North 33º38'41" West, a distance of 120.04 feet;
Thence along a line bearing North 17º15'47" West, a distance of 177.03 feet;

Thence along a line bearing North 89º51'05" West, a distance of 129.37 feet to a point on the Westerly line of E ½ SE ¼ of said Section 18, which said point is a distance of 703.84 feet from the Southwest corner of said E ½ SE ¼ of Section 18;

Thence along said Westerly line, bearing North 0º08'55" East, a distance of 1561.52 feet to a point on the Southeasterly line of the Rock Island Railroad Right of Way;

Thence along said Southeasterly Right of Way line, bearing South 53º23'46" East, a distance of 2441.53 feet to a point on the Westerly line of Ivy Street, which said point is 20.00 feet West of the Easterly line of the W ½ W ½ SW ¼ of said Section 17;

Thence along said Westerly line of Ivy Street, bearing South 0º06'34" West, a distance of 798.94 feet to the Point of Beginning,

EXCEPT any portion thereof conveyed to the City of Commerce City by Deed recorded October 29, 1975 in Book 2026 at Page 267 to wit:

A tract of land located in the County of Adams, State of Colorado, Section 17, Township 3 South, Range 67 West of the 6th P.M., more particularly described as follows:

Beginning at a point on the Southerly line of said Section 17, a distance of 20 feet Westerly from the Southeast corner of the West ½ West ½ Southwest ¼ of said Section 17;

Thence South 89º50'54" West, a distance of 15 feet;

Thence North 00º06’34” West, a distance of 810.12 feet to the Southeasterly right-of-way line of the Rock Island Railroad;

Thence along said Southeasterly right-of-way line, South 53º23’46” East, a distance of 18.68 feet; Thence South 00º06’34” East, a distance of 798.94 feet to the Point of Beginning, County of Adams, Colorado

ATTACHMENT "B"
to the
RESTRICTIVE NOTICE: MAP

Notice of Environmental Use Restriction: Sand Creek

Appendix 6 – Health & Safety Plan

Site Safety and Health Plan

Triangle Logistics Center

48th Avenue between Forest and Ivy

Commerce City, Adams County, Colorado

January 18, 2021

Terracon Project No. 25207313

Prepared for:

CA Industrial Holdings, LLC

Chicago, Illinois

Prepared by:

Terracon Consultants, Inc.

Wheat Ridge, Colorado

1.0 APPLICABILITY

This Safety and Health Plan has been developed for the safety of Terracon personnel engaged in field services at the Triangle Logistics Center (site) located at 48th Avenue between Forest and Ivy Streets in Commerce City, Colorado. The purpose of this plan is to help assure that personnel assigned to field activities on this site leave uninjured at the conclusion of every work day.

This is a living document and is expected to evolve with Terracon's involvement with the site. As such, sections have been marked -RESERVED and are anticipated to be developed concurrently with future site work.

Safety expectations of Terracon personnel working on this site will be as follows.

- Follow the safety rules applicable to your job.
- If it is not safe, do not do it; do not have your co-worker do it either.
- If you see something that is unsafe, **speak up** immediately, there and then, to your supervisor, no matter who — no matter what.
- If you are not sure of something or do not understand something, **speak up and ask**.

All Terracon employees have the right to expect management cooperation in helping to keep them safe. Here is what you can expect from Terracon management while engaging in services at this project site:

- If you stop a task for a safety reason, we will back you up.
- If you bring up a safety concern, we will address it promptly. It will not go into a black hole.
- If there is an injury, we will conduct an incident investigation in a way that does not blame anyone—the person or people involved. The investigation will focus on learning, so that we can eliminate the next injury.

We want every employee to conduct field operations in accordance with our Incident and Injury-Free principals:

- Evaluate the hazards of the work you are getting into and control the hazards to the extent practical before engaging in site services.
- Be observant of people who are inexperienced, are anxious about their work and/or for those who are being complacent with safe work procedures. Speak up to both, out of care and concern, and help them see that doing their work safely is the right thing to do for both them and their families.

- Be open if someone speaks to you about potential unsafe behaviors or equipment, and cooperate in the spirit of getting the job done safely. Everybody deserves a future.

2.0 RULES TO LIVE BY

Incident and Injury-Free (IIF) is based on care and concern and a commitment to everyone going home safely to their family every day. Our Rules to Live By support *IIF* because they (1) are clear and consistent about the actions we take to mitigate our most frequent and potentially severe hazards, and (2) prevent injuries, including potentially serious injuries to ourselves or the public.

2.1 Core Safety Rules

Core Safety Rules: Rules that are common to all employees, and must be complied with at all times as part of planning and performing our work in an *IIF* manner. Rules are followed alongside Terracon and client policies, as well as local, state, and federal laws and regulations.

2.1.1 General

R1. No talking or texting on your cell phone while driving on Terracon business or property. Never pick up the phone or adjust navigation while driving.

R2. Start every job task with pre-task planning and update the plan when personnel or conditions change.

R3. Follow Terracon-required safety training and get authorization before work starts in excavations, in confined spaces, when working at heights, and before other job tasks which require it.

R4. Lift with safe techniques and get help when lifts are awkward or heavier than 50 lbs.

R5. Speak up right away and redirect a co-worker performing an unsafe act to safe work practices.

2.1.2 Personal Protective Equipment (PPE)

R6. Wear PPE as required by project, task, and/or work environment. Inspect before and during use, repairing or discarding and replacing, if defective.

2.1.3 Equipment and Tools

R7. Use Terracon-approved tools and equipment according to manufacturer's instructions, and never modify or override safety devices.

R8. Inspect tools and equipment before, during and after use. If defective, repair, discard, or tag with "Do Not Use" and removed from service. Tell your supervisor.

R9. Always track and keep clear of equipment moving in work areas.

2.1.4 Motorized Vehicles

R10: Wear our seat belts while vehicle is in motion and when parked adjacent to or on an active roadway.

R11: Operate and park vehicle to prevent the need for backing as a first move. If you must back use a spotter. If working alone, use Terracon-approved self-spotting techniques.

R12: Perform a 360° walk-around before moving any motor vehicle. Use a safety awareness cone or steering wheel cover when parked on Terracon business.

R13: Use Terracon-approved methods to secure loads, equipment, and tools on or in the vehicle you are operating.

2.1.5 Reporting an Injury

R14: Call WorkCare (888.449.7787) if you are injured and tell your supervisor right away.

2.2 Core Safety Practices

Core Safety Practices: Lay out basic safety rights and responsibilities that employees need to follow. These work practices are common to all employees, and must be complied with unless we can describe how we planned to do the work more safely. At no time are we allowed to take a less-safe action than what is spelled out in a Practice.

Employees have the right and responsibility to:

P1. Take the time you need to do the job safely.

P2. Warm-Up for Work before physical activity.

P3. Stop your work if you feel unsafe. Tell a supervisor and work together to fix the problem.

P4. Manage controllable hazards and unsafe conditions in your work area. Report hazards you cannot control to a supervisor.

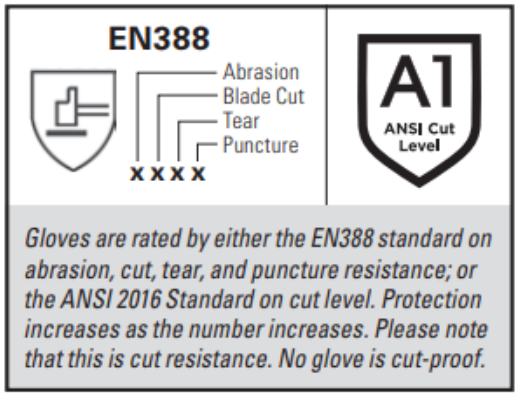
2.3 Safety Accountability Policy

Our Safety Accountability Policy corresponds with our Rules and Practices, and describes what Safety Coaching and accountability steps apply to any employee, regardless of position, who violates a Rule or Practice. Details of the policy are posted on TerraNet and includes specifics about the responsibilities of managers and employees, and consequences for violations.

2.4 Hand Protection

Hand Protection Chart by Hazard Type

Hazards	Minimum Cut Level (ANSI)	Impact Protection	Chemical Resistant	Heat Resistant
Abrasion or scrape (concrete testing)	1	MED		
Burns from high heat (lab oven operations)	1			■
Cut or laceration (utility knife usage)	5			
Chemical Protection[1] (environmental, lab chemicals)	2		■	
Electrical	*Working with live electrical, other than low voltage, requires specific PPE and electrical training (i.e., NFPA 70E).*			
Grease, oil, lubricant, handling wire, cables, chains, and ropes (equipment maintenance)	3	MED		
Impact, pinch, crush, strike (drilling, density tests)	3	MED		
Environmental soil sampling, soil vapor, groundwater, sediment, surface water[1]	3		■	
Geotechnical soil sampling, soil vapor, groundwater, sediment, surface water[1,2]	3			



Gloves are rated by either the EN388 standard on abrasion, cut, tear, and puncture resistance; or the ANSI 2016 Standard on cut level. Protection increases as the number increases. Please note that this is cut resistance. No glove is cut-proof.

[1] For environmental contamination and chemical protection, more than one glove may be appropriate for mitigating a hazard; for example, a nitrile inner glove with outer glove for impact/cut protection. Determine selection based on the Project Safety Plan, job hazard analysis, and pre-task planning.

[2] For logging geotechnical soil samples, gloves may be temporarily removed to determine soil texture. However, before doing so, logger must assess soil to be free of contamination or harmful debris.

3.0 SAFETY AND HEALTH ADMINISTRATION

The Project Manager is ultimately responsible for ensuring that work on this project is performed in accordance with the safety and health provisions contained in this Plan. The designated Site

Safety and Health Officer (SSO) will monitor compliance with this Plan during field activities. All field team members engaged in project activities will be required to sign the "Acknowledgment of Instruction" form included with this Plan. The SSO will maintain a copy of this Plan on site for the duration of project activities.

Subcontractors engaged in project activity at this site will comply applicable provisions of the Occupational Safety and Health Act of 1970, the safety and health requirements set forth in Occupational Safety and Health Administration regulation 29 CFR 1910.120, where applicable, and any applicable state, city or local safety codes. Each subcontractor will be responsible for supplying and utilizing necessary equipment required for safety precautions for the subcontractor's employees engaged in this project.

In order to reduce the potential for accidents, subcontractors will maintain an orderly and safe work area. It will the responsibility of subcontractors to provide whatever safety barricades or warning devices are deemed necessary by Terracon to prevent accidents or injury to field personnel and the general public.

Subcontractors engaged on this project site may utilize this site Safety and Health Plan for their employees, or each subcontractor may develop and utilize their own site Safety and Health Plan provided the provisions of the subcontractor's site Safety and Health Plan are at least as stringent as the requirements contained in this Plan. Decisions regarding equivalence of safety and health requirements shall be made by Terracon Project Manager and Corporate Safety and Health Manager. Adoption of this Site Safety and Health Plan by subcontract employers shall not relieve any site subcontractor for the responsibility for the health and safety of its employees.

Terracon and subcontractor task leaders (if any) will be responsible for:

- Providing subordinate personnel a copy of this Plan, and briefing them on its content.
- Enforcing the applicable provisions of this Plan.
- Inspecting and maintaining equipment in compliance with applicable federal, state or local safety regulations.
- Enforcement of corrective actions.
- Investigation of accidents or injuries.

The following individuals will be responsible for implementation and enforcement of the Plan:

TITLE	NAME	PHONE
Project Managers	John Haas (GEO) Brian Williams (ENV)	303-454-5265 303-454-5250
Safety and Health Mgr.	RJ Story	913-228-7338
Project Safety Officer (ACM)	Kevin Troyer	303-454-5242
Site Safety Officer	Chelsea Parten	214-886-5189
Client Contacts	Joe Trinkle Lynx Chan	281-779-6645 312-209-0608

4.0 MEDICAL SURVEILLANCE REQUIREMENTS

All Terracon personnel participating in field operations on this project will be enrolled in a health monitoring program in accordance with the provisions of OSHA 29 CFR 1910.120 and 1910.134. Each project participant must be certified by a Doctor of Medicine as fit for respirator and semi-permeable/impermeable protective equipment use. The content and frequency of physical examinations will be determined by the Consulting physician in compliance with the requirements of 29 CFR 1910.120.

Follow-up medical examinations will also be provided in the event of illness or unprotected exposure to contaminants in excess of eight-hour time weighted average permissible exposure limits.

5.0 EMPLOYEE TRAINING REQUIREMENTS

All Terracon field personnel must have completed 40-hour Hazardous Waste Operations Training per the requirements of OSHA 29 CFR 1910.120. In addition, a current 8-hour annual refresher training certificate will be required for all field personnel whose initial training date was greater than 12 months from the first date of work on this project.

Prior to the start of site activities, the SSO will conduct a pre-project safety and health briefing for all project participants. The personnel responsible for project safety and health will be addressed, as will site history, scope of work, site control measures, emergency procedures and site communications. The briefing will address site contaminants, air monitoring protocols and results, and the level of personal protective equipment to be employed for each project task.

Daily "tailgate" safety and health briefings will be presented by the SSO at the start of each work day. In addition to a general review of the proposed daily activity and safety requirements, the results of previous air monitoring and any procedural changes will be addressed. A daily tailgate safety meeting documentation form is attached as an Appendix to this plan.

6.0 RESPIRATORY PROTECTION PROGRAM

All respirators employed by Terracon personnel will be NIOSH-approved. Cartridges and filters for air purifying respirators will be appropriate for the contaminants of concern. Cartridge/filter selection will be made by the Terracon Corporate Safety and Health Manager. Project personnel required to wear respiratory protection will be medically cleared for respirator use, trained and successfully fit tested in accordance with OSHA 29 CFR 1910.134. Personnel required to wear respirators will demonstrate competence in donning/doffing and inspecting the equipment prior to job assignment. All project tasks requiring the use of supplied air respirators will require properly equipped backup personnel.

At a minimum, air purifying respirator cartridges will be changed daily prior to use. More frequent change of respirator cartridges may be specified based on the results of site air monitoring. Under no circumstances will air purifying respirators be used in areas deficient in oxygen (<19.5%), in areas classified as immediately dangerous to life and health (IDLH), or in areas where contaminants have not been characterized.

Respirators will be inspected and required fit checks will be performed prior to use, and any necessary repairs will be made before proceeding to the project site. Respirators will be sanitized daily after use.

7.0 SITE HISTORY/SCOPE OF SERVICES

The site was historically used as a municipal landfill and site grounds consist of an engineered soil cover over refuse. An active landfill gas collection system is present at the site. Landfill gas production and the effectiveness of the landfill gas extraction system remedy are monitored, and landfill gas concentrations are reported to have declined over time from approximately 35% methane by volume in 1991 to 25% methane by volume in 2015. Uncontrolled, the reported concentrations still represent potentially explosive conditions.

According to EPA investigation documents, landfill disposal operations at this facility began around 1967 and the facility officially operated as a municipal waste landfill from 1968 until 1975. Prior investigations encountered refuse at the site in thicknesses ranging from approximately 14 feet along the northern site boundary to approximately 40 feet below ground surface (bgs) along southern property line. Refuse was reported to include construction debris as well as commercial and residential refuse. Hazardous materials, though suspected by EPA investigators, were not documented to have been disposed of in the landfill, and subsequent investigations determined

that the landfill leachate is not considered to be negatively affecting regional groundwater quality. Native soils present beneath the fill material do not appear to have been characterized as part of the EPA-led investigations.

The groundwater monitoring program established as part of the response actions has included the collection of groundwater data from monitoring points both upgradient and downgradient of the site since 1986. Concentrations of contaminants of concern (COCs) in groundwater at the site are generally declining with the volatile organic compound (VOC) analyte tetrachloroethene (PCE) still currently exceeding regulatory standards in two monitoring wells, upgradient monitoring well FIT-MW3, located on the northern (downgradient) side of the former Chemical Sales Corp Superfund Site, and downgradient monitoring well L-15 located on the northerly adjoining Shamrock Foods facility. The chlorinated solvent contamination at the site has been attributed to off-site upgradient sources.

It is anticipated that soil and groundwater at this project site may be impacted with VOCs, metals, landfill debris, and/or asbestos-containing material (ACM). The personal protective equipment and direct-reading air monitoring protocols specified below are designed to prevent personnel exposure to contamination in excess of permissible exposure limits.

7.1 Scope of Services

Services to be conducted on this project site will include the following:

- Soil/Groundwater Sampling
- Soil Boring (Drill Rig)
- Excavation Oversight
- Remedial System Installation (LFGES, Building VMS)
- Monitoring Well Installation
- LFGES, Building VMS monitoring

7.2 Asbestos Sample Collection

7.2.1 Sample Collection Equipment

In addition to the personal protective equipment outlined below, the SSO will be equipped with a sampling equipment kit containing, as a minimum, the following items.

- Utility Knife
- Coring Tool
- Duct Tape
- Sample Containers (preferably Ziploc® style clear plastic bags)
- Spray Atomizer containing Detergent Amended Water

- Flashlight

Wet methods will be employed in collecting all suspect ACM samples.

7.2.2 Asbestos Fiber Release

Asbestos bulk sampling activities must prevent the generation of dusts and airborne fibers. Each sample team member will carefully assess the condition of suspect ACM prior to sampling or otherwise disturbing the material. Wherever possible, sample collection will be conducted at a level below the breathing zone of the sampler.

If sampling impregnated materials or other suspect ACM that appear non-friable (floor tiles, mastic, roofing felt or sealant, ceiling tile, etc.) respiratory protection should not be required. If collecting samples of friable suspect ACM or normally non-friable materials that are in deteriorated condition, precautions must be taken to prevent the release of fibers to the work area. Precautions include isolation of the material prior to disturbance (i.e., glove bagging) and the use of wet sampling methods as described in the Materials Management Plan (MMP) for the site dated November 19, 2020.

7.2.3 Personal Protective Equipment

The Terracon Project Safety Officer (ACM) will ensure that all project personnel mobilize the following personal protective equipment to the project site on each day of sample collection:

- Tyvek (standard) protective coveralls
- Half-face or full-face air purifying respirator equipped with HEPA cartridges
- Abrasion/cut resistant gloves
- Tyvek boot covers or washable outer footwear

If suspect materials are in deteriorated condition and fiber release appears likely during asbestos sampling activities, sampling personnel will upgrade to **LEVEL C** personal protective equipment as itemized above. Personnel will remove protective clothing before proceeding into other areas of the site in accordance with the decontamination procedures outlined below.

8.0 HAZARD ASSESSMENT

8.1 Chemical Hazards

Soils and groundwater at this project site are possibly contaminated by VOCs, Semi-volatile Organic Compounds (SVOCs), PCBs, metals, herbicides, pesticides, asbestos, methane gas, and/or biological hazards. The following sections identify the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs) and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) of the contaminants

of concern. OSHA PELs are legally-enforceable, whereas the ACGIH TLVs are recommended exposure limits and are not enforceable. The PELs and TLVs may be 8-hour time-weighted average (TWA), Short-term Exposure Limits (STELs) of 15 minutes, or Ceiling Limits (C).

8.1.1 GASOLINE

OSHA PEL: Not established
ACGIH TLV: 300 ppm TWA; 500 ppm STEL
Gasoline is irritating to the skin, eyes and mucous membranes. Dermatitis may result from prolonged contact with the liquid. Gasoline acts as a central nervous system depressant. Exposure may cause staggering gait, slurred speech and mental confusion. Gasoline exposure may affect the liver, kidneys and spleen. Absorption of alkyl lead antiknock compounds contained in many gasoline's poses an additional health concern, especially where there is prolonged skin contact.

8.1.2 DIESEL FUEL (No. 2-D)

OSHA PEL: Not established
ACGIH TLV: 100 mg/m^3 ppm TWA
Diesel fuel is a skin and mucous membrane irritant and a central nervous system depressant. Poisoning may affect the liver and kidneys. Skin contact may result in drying and cracking of the skin.

8.1.3 BENZENE

OSHA PEL: 1 ppm TWA; 5 ppm STEL; 0.5 ppm Action Level
ACGIH TLV: 0.5 ppm TWA: 2.5 ppm STEL
Benzene is a central nervous system depressant and an eye and skin irritant. Poisoning may cause hemorrhages and immunosuppression. A relationship has been discovered between benzene exposure and leukemia. Benzene is regulated as an occupational carcinogen. Acute exposure may cause dizziness, excitation, weakness, headache, giddiness, breathlessness and chest constriction.

8.1.4 TOLUENE

OSHA PEL: 200 ppm TWA; 300 ppm C
ACGIH TLV: 20 ppm TWA
Toluene is an eye, skin and mucous membrane irritant and a central nervous system depressant. Poisoning may affect the liver and kidneys. Prolonged exposure may affect the heart and blood. The ingestion of alcoholic beverages may enhance the toxic effects of toluene. Symptoms of exposure include respiratory tract irritation, headache, dizziness and eye irritation. Toluene may be absorbed to the bloodstream via skin contact.

8.1.5 ETHYL BENZENE

OSHA PEL: 100 ppm TWA
ACGIH TLV: 20 ppm TWA
Ethyl benzene is a skin, eye and mucous membrane irritant. It is moderately toxic by ingestion and slightly toxic by skin absorption. Ethyl benzene is a central nervous system depressant. Poisoning may affect the liver. Symptoms of exposure may include a sense of chest constriction and nervous disorders. Skin contact may result in first- and second-degree burns. The odor can be detected at 140 ppm and irritation occurs at ~200 ppm.

8.1.6 XYLENE

OSHA PEL: 100 ppm TWA
ACGIH TLV: 100 ppm TWA; 150 ppm STEL
Xylene is a mild eye and mucous membrane irritant, primary skin irritant and a central nervous system depressant. Ingestion causes severe gastrointestinal upset and creates an aspiration hazard. Chronic inhalation results in symptoms that resemble acute poisoning, but are more severe systemically.

8.1.7 POLYCHLORINATED BIPHENYLS (PCBs)

OSHA PEL: 42% chlorine: 1 mg/m^3; 54% chorine: 0.5 mg/m^3 TWAs
ACGIH TLV: 42% chlorine: 1 mg/m^3; 54% chorine: 0.5 mg/m^3 TWAs
PCBs are a group of highly toxic commercially produced compounds. PCBs have been shown to cause cancer in animals, and there is also evidence that they can cause cancer in humans. Toxic effects such as endocrine disruption and neurotoxicity are also associated with certain compounds within the group. Common symptoms include dermal and ocular lesions, irregular menstrual cycles and lowered immune responses. Other symptoms include fatigue, headaches, coughs, and unusual skin sores.

8.1.8 ASBESTOS CONTAINING MATERIALS (ACM)

OSHA PEL: 0.1 fiber/cubic centimeter (f/cc) TWA; 1.0 f/cc 30-minute Excursion Limit
ACGIH TLV: 0.1 f/cc TWA
Asbestos is a recognized human carcinogen. It causes asbestosis, cancer of the lungs and digestive tract and mesothelioma. Asbestosis is a lung disorder characterized by a diffuse interstitial (between cell) fibrosis. The onset of asbestosis probably depends upon the asbestos dust concentration, the morphology of the fiber and length of exposure. Cigarette smoking is strongly implicated as a co-carcinogenic among asbestos workers.

8.1.9 INORGANIC LEAD

OSHA PEL: 0.05 mg/m^3 TWA; 0.03 mg/ m^3 Action Level

ACGIH TLV: 0.05 mg/m³ TWA
Lead is a cumulative neurotoxin. The principal symptoms of poisoning are gastrointestinal upset, peripheral neuropathy, and anemia. Acute poisoning following ingestion of soluble lead compounds causes metallic taste, abdominal paint, vomiting, diarrhea, black stools, oliguria, collapse and coma.

Chronic exposure from ingestion, inhalation, or skin absorption is characterized by central nervous system and gastrointestinal disturbances and anemia. The threshold limit value was set to prevent systematic effects.

8.1.10 INORGANIC ARSENIC

OSHA PEL: 0.01 mg/m³ TWA; 0.005 mg/m³ Action Level
ACGIH TLV: 0.01 mg/m³ TWA
Arsenic causes damage to the following organs: kidneys, lungs, the nervous system, mucous membranes. Arsenic exposure may be associated with liver cancer. Occupational exposure to arsenic may be a risk factor for coronary disease, stroke, and peripheral arterial disease. Occupational exposure to arsenic may increase the risk of developing stomach cancer. Arsenic may be genotoxic and may cause Raynaud's phenomena, which is a peripheral vascular disease characterized by spasm of the digital arteries and numbness of the fingers. Arsenic may cause Bowen's Disease, a neoplastic skin disease. Arsenic is combustible at high temperatures.

8.1.11 ELEMENTAL AND INORGANIC MERCURY

OSHA PEL: 0.1 mg/m³ TWA
ACGIH TLV: 0.025 mg/m³ TWA
Acute (short-term) exposure to high levels of elemental mercury in humans results in central nervous system (CNS) effects such as tremors, mood changes, and slowed sensory and motor nerve function. Acute exposure to inorganic mercury by the oral route may result in effects such as nausea, vomiting, and severe abdominal pain. The major effect from chronic exposure to inorganic mercury is kidney damage.

Chronic (long-term) exposure to elemental mercury in humans also affects the CNS, with effects such as erethism (increased excitability), irritability, excessive shyness, and tremors. Human studies are inconclusive regarding elemental mercury and cancer.

8.1.12 TRICHLOROETHENE

OSHA PEL: 100 ppm TWA; 300 ppm C
ACGIH TLV: 10 ppm TWA; 25 ppm STEL
Trichloroethylene is a clear, colorless volatile liquid with a sweet, chloroform-like odor. Trichloroethylene is a narcotic, an irritant to the skin and mucous membranes, a liver and kidney

toxin and is believed by NIOSH to be a potential human carcinogen. Workers exposed to concentrations averaging 10 ppm complained of headache, dizziness and sleepiness. Prolonged inhalation of vapors may result in central nervous system depression, nausea, narcosis, headache and nausea. Skin contact may cause drying, redness and irritation. Chronic exposure to trichloroethylene vapors may cause kidney and liver damage.

8.1.13 PERCHLOROETHENE

OSHA PEL: 100 ppm TWA ; 200 ppm C
ACGIH TLV: 25 ppm TWA; 100 ppm STEL
Perchloroethylene (tetrachloroethylene) is a clear, colorless, volatile liquid with an ether-like odor. NISOH considers perchloroethylene to be a potential human carcinogen. Tetrachloroethylene causes central nervous system depression and liver damage. Defatting action of the skin can lead to dermatitis. Unconsciousness, dizziness, headache, vertigo or light narcosis have occurred in many instances after occupational exposure.

8.1.14 1,2-DICHLOROETHENE

OSHA PEL: 200 ppm TWA
ACGIH TLV: 200 ppm TWA
1,2-Dichloroethylene is a colorless liquid with a sweet, pleasant odor. The pure product liberates flammable, irritating vapor. Acute exposure to high concentrations of dichloroethylene vapors can cause central nervous system effects, dizziness, nausea and vomiting. Chronic exposure to high levels of dichloroethylene can lead to kidney, liver and central nervous system damage.

8.1.15 VINYL CHLORIDE

OSHA PEL: 1 ppm TWA ; 0.5 ppm Action Level
ACGIH TLV: 1 ppm TWA
Vinyl chloride is regulated by OSHA as an occupational carcinogen. Acute exposure to high concentrations of vinyl chloride can cause central nervous system effects, headache, dizziness, drowsiness, incoordination and confusion. Chronic exposure has been shown to cause cancer.

8.1.16 BENZO(A)ANTHRACENE

OSHA PEL (as Coal Tar Pitch Volatiles) : 0.2 mg/m^3 TWA
ACGIH TLV: as low as achievable
Benzo(a)anthracene is a probable carcinogen in humans. There is evidence that it causes cancer in humans and it has been shown to cause liver and lung cancer in animals. It may also have the potential for causing reproductive damage in humans but has not been tested.

8.1.17 BENZO(B)FLUORANTHENE

OSHA PEL (as Coal Tar Pitch Volatiles) : 0.2 mg/m³ TWA
ACGIH TLV: as low as achievable
Benzo(b)fluoranthene is a probable carcinogen in humans. There is evidence that it causes cancer in humans and it has been shown to cause liver and lung cancer in animals. It may also have the potential for causing reproductive damage in humans but has not been tested.

8.1.18 INDENO(1,2,3-CD)PYRENE

OSHA PEL: Not established
ACGIH TLV: Not established
Indeno(1,2,3-cd)pyrene is a probable carcinogen in humans. There is evidence that it causes cancer in humans and it has been shown to cause liver and lung cancer in animals. It may also have the potential for causing reproductive damage in humans but has not been tested.

8.1.19 PESTICIDES

OSHA PEL: Various
ACGIH TLV: Various
The Environmental Protection Agency (EPA) oversees pesticide use through the Worker Protection Standard (WPS). Pesticides are substances meant for attracting, seducing, destroying, or mitigating any pest. They are a class of biocide, or chemical substance which can deter, render harmless, or exert a controlling effect on any harmful organism by chemical or biological means. The health effects of pesticides depend on the type of pesticide. Some can affect the nervous system or irritate the skin or eyes. Some pesticides may be carcinogens. Others may affect the hormone or endocrine system in the body.

8.1.20 HERBICIDES

OSHA PEL: Various
ACGIH TLV: Various
Herbicides are chemicals used to manipulate or control undesirable vegetation. The potential effects of herbicides are strongly influenced by their toxic mode of action and their method of application. Herbicides are a possible carcinogen and may be a contributing factor to Parkinson's disease. Some herbicides cause a range of health effects ranging from skin rashes to death.

8.1.21 Methane

Lower Flammable Limit – 5% (concentration in air)
Upper Flammable Limit – 15% (concentration in air)
Methane is a non-toxic, colorless, odorless and tasteless gas. Methane is lighter than air. Methane is produced by the anaerobic decomposition of organic matter. Methane is considered a simple

asphyxiant (i.e., is toxic only in its ability to displace normal oxygen. Methane is extremely flammable; the explosive range is indicated above.

8.1.22 Hydrogen Sulfide

OSHA PEL: 20 ppm C
ACGIH TLV: 1ppm TWA; 5 ppm STEL
Hydrogen sulfide is a highly toxic and flammable gas (flammable range: 4.3-46%). Being heavier than air, it tends to accumulate at the bottom of poorly ventilated spaces. Although very pungent at first (it smells like rotten eggs), it quickly deadens the sense of smell, so victims may be unaware of its presence until it is too late. Hydrogen sulfide is a broad-spectrum poison that can poison several different systems in the body, although the nervous system is most affected. The toxicity of is comparable with that of carbon monoxide.

8.2 Groundwater Sampling Precautions

Personnel engaged in groundwater sampling are advised that organic vapors from contaminated groundwater can collect in temporary wells and be displaced by bailers.

- Approach temporary wells from the upwind side.
- Remove the cap and allow the well to vent momentarily before introducing bailers.
- Keep breathing zone back and to the upwind side of wells during bailing activities.

8.3 Drilling Safety Precautions

Activities to be performed on site may involve drilling and/or hydraulic probe equipment and materials. Personnel should be aware that as personal protective equipment increases, dexterity and visibility may be impacted and performing some tasks may be more difficult. Tape all loose protective clothing to avoid entanglement in rotating equipment.

Other drilling safety precautions to be observed during this assessment include the following:

- Before drilling/excavation proceeds, underground utilities must be located and marked.
- All personnel working around drill rigs/excavation equipment will be familiarized with emergency shut-down procedures and the position of "kill" switches.
- No loose fitting clothing, jewelry or unsecured long hair is permitted near the rig.
- Keep hands and feet away from all moving parts while drilling/excavation is in progress. Shovel auger cuttings with long handled shovel. *DO NOT* use hands or feet.
- Daily inspection of all ropes, cables and moving parts is mandatory.
- A first aid kit and fire extinguisher will be immediately available at all times.
- All drill/excavation crews must consist of at least two persons.

- No drilling/excavation is permitted during impeding electrical storms, tornadoes or when rain creates a hazardous work environment.
- A minimum horizontal and vertical clearance distance of 20 feet must be maintained between the drill rig and overhead power lines; use spotters to help rig operator maneuver the vehicle when near overhead power lines.
- Personnel will not enter excavations to collect samples. Samples will be either be obtained from backhoe buckets or other sampling devices of sufficient length to prevent the necessity for excavation entry, or collected from stockpiles placed a minimum of 5 feet away from trench.
- Ground personnel will remain upwind and outside the swing radius of backhoe buckets during exaction. Line-of-sight contact with the backhoe operator must be maintained.

8.3.1 Drilling Safety Precautions – Landfill gases

An active landfill gas collection system is present at the site and landfill gas concentrations were reported to be approximately 25% methane by volume in 2015. The reported concentrations represent potentially explosive conditions. The SSO will be charged with monitoring the atmosphere in and around the borehole location while drilling to evaluate for the presence of methane, hydrogen sulfide, and VOCs. Drilling personnel will also be equipped with personal hydrogen sulfide detectors. Drilling will be suspended if:

- **Methane is detected at 5% or higher of the Lower Explosive Limit (LEL), or**
- **Hydrogen sulfide is detected at a concentration of 5 parts per million (ppm).**

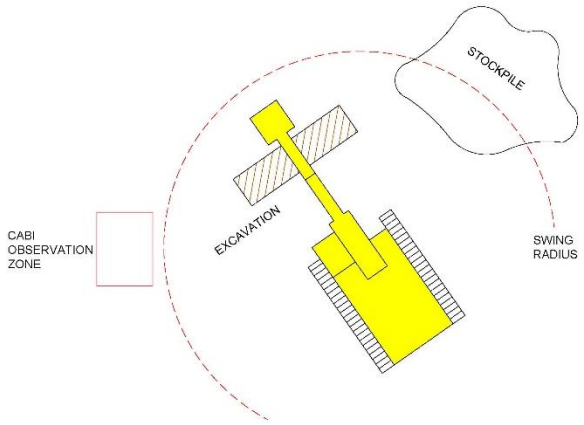
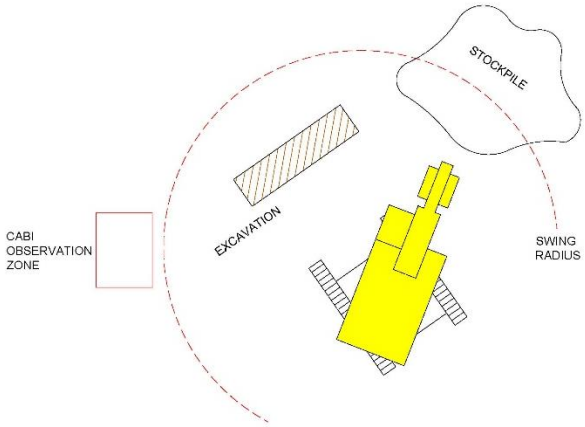
The borehole will be given time to off-gas and conditions will be reevaluated prior to re-commencing drilling.

8.4 Excavation Equipment Safety Precautions

Terracon site personnel will position themselves within sight of the excavator operator and outside the swing radius of the backhoe bucket. The backhoe operator will set the backhoe bucket, power down the backhoe and stand-by at ground level before Terracon approach the excavated area to collect samples.

Terracon Rules to Live By, Rule Number 9 states "**Always track and keep clear of equipment moving in work areas**". As such, the diagram below depicts the proper work activity area for the collection of samples at an excavation.

OUTSIDE SWING RADIUS	ENTER SWING RADIUS
During excavation, the soils must be observed from beyond the swing radius	The soil may be inspected, field screened, and/or sampled when the excavator operator

	has acknowledged you and brought movement to a full stop and removed their hands from the controls. 

Other backhoe operations safety precautions are as follows:

- The backhoe loader controls should only be operated from the operator's position — for the operator's safety, controls should never be activated from the ground.
- While operating a backhoe loader, the operator must be aware of several safety procedures. During travel, the bucket or other attachments should be carried as low as possible, and the backhoe should be locked in the transport position. It is important to the stability of the unit that travel or turning is done with the lift arms down and that the operator is looking in the direction of travel.
- Loading, unloading and turning should be done on flat, level ground. The operator should slow down when turning or traveling with a full bucket. Other important safety tips include keeping the heavy end of the backhoe loader uphill with the loader bucket full. The backhoe loader should go directly up or down a slope or incline with the loader bucket empty and not drive across slopes.
- When picking up a load, the operator must be aware to not exceed the rated operating capacity of the machine. Operators should never use attachments that exceed the capacity of the backhoe loader or are not approved for use by the manufacturer. When lifting objects with the backhoe loader, it is important that the operator keeps the objects balanced and as close to the backhoe loader as possible. The operator should swing lifted objects slowly and always lower objects to the ground before leaving the machine. The stabilizers should be used for increased stability when lifting objects with the backhoe loader.

- Most important to ensuring others' safety, the operator should never swing loads over other personnel. Some backhoe loaders come with an emergency stop button so operators can quickly shut down the backhoe loader, if needed.
- Every operator should be aware of the environmental conditions surrounding the backhoe loader. Operators should never use a backhoe loader in an atmosphere with explosive dust or gases or where the backhoe loader exhaust can contact flammable materials — explosion or fire can result. Exhaust gases can kill, therefore, it is important to have adequate ventilation when using a backhoe loader in an enclosed area.
- Before leaving a backhoe loader, operators should lower the lift arms and backhoe boom (unless it is locked), place the attachment flat on the ground, put all the controls in neutral, engage the parking brake, stop the engine and remove the key.
- Operators should never use a backhoe loader without an operator cab that does not have Rollover Protective Structure (ROPS) or Falling Object Protective Structure (FOPS) approval — the cab should not be modified from the manufacturer's original design in order to best protect the operator. Some open cab models allow operators to enter and exit from both sides of the machine. However on backhoe loaders with curb-side exit only, operators should be aware of traffic when exiting the cab.

8.4.1 Safety of Ground Personnel

- Operators should not carry riders. Also, operators should not allow bystanders within the backhoe arm working area — workers should never enter a trench while the backhoe is working and should wait to enter the trench until it has been reinforced with proper shoring equipment after the excavation is complete.
- Bystanders should also be aware of the machine's operation at all time, keeping out of the backhoe swing area and away from the stabilizers. No one should ever reach under or stand under raised lift arms, unless an approved lift arm support device is employed. Accidental movement of a lift arm control lever can cause the lift arms to drop.

8.5 In the Event of ACM Fiber Release

In the event that small amounts of suspect asbestos are released during the course of drilling, team members will immediately evacuate the area and don Level C personal protective equipment. The area of potential ACM release will then be approached by the SSO and suspect materials will be managed according to procedures set out in the MMP.

In the event that large quantities of potential ACM are released during field activities, personnel will immediately evacuate the area and notify the Project Safety Officer (ACM) and the client representative. The Project Safety Officer (ACM) will request that the area be sealed until a properly

attired response team can be mobilized to the area with a HEPA vacuum and other equipment considered necessary by the Project Safety Officer (ACM) and Terracon Corporate Safety and Health Manager.

8.6 Site Physical Hazards/Precautions

The physical hazards associated with intrusive site activities can include inclement weather, material handling, slips/falls etc. Some anticipated hazards and means for preventing injury from those hazards are as follows:

- **Back injuries due to improper lifting** - Use proper lifting techniques. Lift with the legs, not the back. Keep loads close to the body and avoid twisting. Loads heavier than 50 pounds (lbs.) require a second person or mechanical device for lifting. Use mechanical devices such as drum dollies, hand trucks, and tool hoists (for lifting augers) to lift or move heavy loads whenever possible.
- **Ergonomic Stress** - Lift carefully with load close to body with the legs taking most of the weight. Get help with lifts greater than 40 lbs. When working with a heavy tool or object, keep legs under the load and do not overreach or twist to the side. Reposition body to be more square to the load and work. Push loads, rather than pull, whenever feasible. Do not persist with lifting when the load is too heavy. Use a mechanical lifting aid or have a coworker assist with the lift. Rotate repetitive tasks to avoid soft-tissue fatigue.
- **Falls From Elevated Surfaces** - Protect employees from falling off surfaces that have a side or an edge that is 6 ft. or more above a lower level. Provide a safety harness and shock-absorbing lifeline or adequate fall protection where applicable. Employees must wear them when working 6 ft. or higher above the platform or main work deck. Install either a guardrail system or fall arrest system that conforms to 29 CFR 1926.502 (d) and is approved by the American National Standards Institute.
- **Vehicles** - Obey all site traffic signs and speed limits. Seat belts must be functional and in use during operation of any site vehicles (including rentals). Operator shall regularly inspect the vehicle for defective parts, such as brakes, controls, motor, chassis and drives. Always be aware and stay alert to traffic around the work area.
- **Inclement Weather** – The project may be shut down by the SSO during the following inclement weather conditions: poor visibility; precipitation severe enough to impair safe movement or travel; lightning in the immediate area; steady winds in excess of 40 mph; or, other conditions as determined by the SSO or Corporate Safety and Health Manager. Work will resume when the conditions are deemed safe by the SSO.
- **Noise** - Wear hearing protection when speech becomes difficult to understand at a distance of 10 ft. and while standing within 20 to 25 feet from heavy equipment,

pneumatic power tools, steam cleaners, and other equipment in operation that can generate more than 85 decibels (A-weighted scale) (dBA).

- **Slips, Trips, and Falls** - Clear work area of obstructions and debris before setting up. Alter work areas as necessary to provide a safe, reasonably level area. All walking and working surfaces shall continually be inspected and maintained to be free of slip, trip, and fall hazards. Keep platforms, stairs, and immediate work areas clear. Do not allow oil, grease, or excessive mud to accumulate in these areas. Eliminate slip, trip, and fall hazards or identify them clearly with caution tape, barricades, or equivalent means. Store loose or light material and debris in designated areas or containers. Secure tools, materials, and equipment subject to displacement or falling.
- **Traffic Control** - If site activities interrupt the normal flow of pedestrian or vehicular traffic, barricades and warning signs which comply with the Manual on Uniform Traffic Control Devices and/or State or local ordinances will be erected around affected equipment. Safety orange work vests will be worn by personnel working within 10 feet of any active roadway. All borings or partially completed groundwater monitoring wells will be adequately covered and/or barricaded if left unattended for any period of time.
- **Confined Spaces –** No work will be conducted within confined spaces without discussion with the Corporate Safety and Health Manager and development of a confined space safety plan and permit.
- **Electrical Contact Entry -** Personnel will remain cognizant of the location and condition of electrical wiring during the course of this assessment. A visual assessment of each work space will be made prior to sample collection and electrical contact hazards will be evaluated. Unguarded junction boxes, exposed wiring, knife switches, etc. will be avoided in collection of bulk samples of suspect materials.
- **Ladders -** All ladders will conform to OSHA 29 CFR 1926.1053. Ladders must be inspected prior to use and as often as necessary to ensure the ladder can support the load and function as designed. Ladders to be used in areas where electrical hazards may exist must be made of nonconductive materials. Personnel utilizing ladders shall be aware of hazards with ladders and use them properly. Step ladders shall be set up with legs fully spread and on solid footing. Extension ladders will be set up at a 4:1 ratio of rise to run. Extension ladders shall be secured at the top and bottom on solid footing when personnel are using them and extend at least 3 feet above the top of the surface to which access is required.

  Ladders shall not be used if damaged or where oil and grease cause additional slipping hazard. The appropriate type and capacity of ladder shall be used for the work to be performed. The SSO may be consulted with any questions regarding ladders.

8.7 Biological Hazards

In addition to the chemical contaminants identified in site groundwater, disease-causing microorganisms (bacteria, fungus, viruses, and molds) may exist in decaying organic materials which may be present in fill materials. Illness may result from inadvertent ingestion of these microorganisms. Partially buried sharp or jagged debris, broken glass and rusty metal pose trip, puncture and potential laceration hazards. Safety footwear is MANDATORY for this project. Decaying organic material in fill areas will potentially yield flammable methane gas. Off-gassing of methane generated in sub-surface fill areas can also bring organic vapors from buried chemical substances to the surface. Due to the potential presence of methane being liberated to the surface during drilling and excavation in fill areas, smoking is banned at this site.

Biological hazards may also include ticks, fleas, mosquitoes, wasps, spiders or other pests; poisonous plants (poison ivy, poison oak); snakes; thorny bushes and trees; and medical waste.

Current field work is planned for the winter season when insect, plant, and animal activity is considered to be low.

8.7.1 Mosquito Borne Disease - RESERVED

8.7.2 Tick borne diseases - RESERVED

8.7.3 Stinging Insects - RESERVED

8.7.4 Poisonous Plants

Poison ivy, poison oak or poison sumac may be present in the work area. Personnel should be alerted to the presence of these plants, and instructed on methods to prevent exposure.

The main control is to avoid contact with the plant, cover arms and hands, and use Ivy Block barrier cream on exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with Ivy Wipes or soap and water, and observed for signs of reddening.

8.7.5 Snakes

The possibility of encountering snakes exists, specifically for personnel working in heavily wooded/vegetated areas. Avoid walking in areas where snakes may nest or hide. When walking, always look ahead for signs of snakes. Employees should make as much noise as possible when approaching a possible snake area to give snakes time to leave. Use a long handled shovel,

heavy equipment or other tools when moving or lifting objects that could be used by snakes as cover. Never reach under or behind objects or into other areas where snakes may hide. Look before placing your hands or feet anywhere, and do not put your hands or feet into places you cannot see. Avoid walking alone in snake-infested areas. Do not go out of your way to disturb or kill a snake. Avoid snakes – living and dead. Even dead snakes can bite reflexively.

If an employee is bitten by a snake the following actions are recommended: An attempt should be made to identify the snake. Do not try and capture or kill the snake.

The victim should be transported to the nearest hospital within 30 minutes. First aid consists of washing the area around the wound to remove any unabsorbed venom. Keep the victim calm and limit the victim's physical activity. While limiting movement of the bitten body part, keep the bitten area at the level of the heart.

Remove all constricting clothing or jewelry from the bite site because swelling may occur. Remove shoes if bitten on the leg.

- Do not apply a tourniquet.
- Clean the wound if possible.
- Do not pack wound in ice or apply heat.
- Do not give the victim a sedative or alcohol.
- Do not waste time capturing or killing the snake.
- Do not cut into the bite area; you might damage important nerves, tissues or muscles.

9.0 EXCAVATION SAFETY PRECAUTIONS

The OSHA Excavations standard (29 CFR 1926, Subpart P) requires employers responsible for an excavation to assign a "competent person" to oversee the excavation and to safeguard personnel who may be required to enter the excavation. Terracon generally has no direct control of excavation activities. This responsibility is typically assumed by the general contractor or the excavation contractor. Terracon personnel assigned to trenching/excavation projects which are NOT under Terracon control will remain alert to potential site hazards and conduct their duties in compliance with the applicable provisions of this section. On the occasions where an excavation is under the direct control of Terracon, the Terracon Project Manager/Office Manager will designate a competent person responsible for oversight of the excavation and for compliance with this policy and applicable provisions of the OSHA Excavations standard. The designated competent person will be qualified to act in that capacity through formal instruction, on-the-job experience or a combination of both. This policy is established to prevent injury and potential property damage and to comply with applicable state and federal safety standards.

9.1 General Duties of Competent Person

Prior to the start of excavation projects, the Competent Person must:

- A. Verify that all underground and overhead utilities have been identified, isolated and/or protected. Terracon personnel will NOT permit excavation under Terracon control to proceed until the authorized underground utility location service has been contacted and the site has been appropriately located and marked.
- Evaluate potential hazards and personal protective equipment requirements, develop safe work procedures and emergency action plans as required.
- Furnish properly maintained equipment and tools for the job.
- Prevent unauthorized employees from access to work areas by erecting barricades, signs, gates or stationing of employees as required.
- Verify that soil conditions, angle of slope, shoring and techniques for protective systems are properly developed for the existing soil conditions, type of project and weather conditions.

9.2 Inspection by Competent Person

The designated competent person will conduct daily inspections of excavations and surrounding areas. The inspection will focus on the following factors:

- Indications of a situation which could result in cave-in.
- Indications of a failure of a protective system.
- Development of a possibly hazardous atmosphere.

Inspections will be conducted at the beginning of the shift and as required throughout the work shift. Inspections will be made after every rainstorm or other hazard-increasing occurrences. If hazards are determined to exist, the Competent Person will immediately remove exposed employees from the excavation until the necessary corrections have been made.

9.3 Personnel Entry/Evacuation

Terracon personnel are advised that the OSHA Excavations standard requires sloping, shoring or shielding in all excavations greater than five (5) feet in depth unless the excavation is made

entirely in stable rock. Therefore, Terracon employees will not enter unshored excavations with vertical sidewalls in excess of five (5) feet in depth unless the excavation is in stable rock or unless shielding such as a trench box is provided. Terracon personnel will not enter soil trenches with unshored vertical sidewalls more than five (5) feet in depth until an inspection has been performed by a Competent Person, and the Competent Person has approved personnel entry.

Technicians, engineers or other professionals who observe situations which could potentially result in cave-in, failure of protective systems or other hazardous conditions will immediately report their concerns to the excavation contractor, Project Manager, or other responsible party, and order all Terracon personnel out of the trench or excavation. Terracon personnel will not permit Terracon employees to enter or re-enter the excavation until the hazardous condition has been eliminated.

9.4 Access and Egress

Personnel with experience in structural design will oversee development of structural ramps and runways for employee access and egress during trenching and excavation projects. Safe means of egress (stairways, ladders or ramps) must be provided in trench excavations greater than 4 feet in depth and positioned such that no more than 25 feet of lateral travel is required. Walkways designed for employee or equipment crossover will be equipped with standard guardrails and toeboards.

9.5 Water Accumulation and Adjacent Structures

The Competent Person will oversee the operation of water removal equipment. Personnel will not work in excavations with accumulated water unless adequate precautions to protect them from cave-ins are provided and approved by the Competent Person responsible for the excavation.

Diversion ditches, dikes or other control methods will be employed to prevent water accumulation in the trench or excavation.

Whenever excavations below the level of the base or footing of any foundation or retaining wall could pose potential hazard to employees or structures, a registered Professional Engineer with geotechnical experience in will be consulted, and shoring, bracing and/or underpinning will be used when required to ensure the stability of adjacent structures and buildings.

9.6 Excavation Safety Precautions – Landfill gases

An active landfill gas collection system is present at the site and landfill gas concentrations were reported to be approximately 25% methane by volume in 2015. The reported concentrations represent potentially explosive conditions. The SSO will be charged with monitoring the atmosphere in and around the excavation prior to and while work is being performed to evaluate for the presence of methane, hydrogen sulfide, and VOCs. As appropriate, personnel will also be equipped with personal hydrogen sulfide detectors. Excavation work will be suspended if:

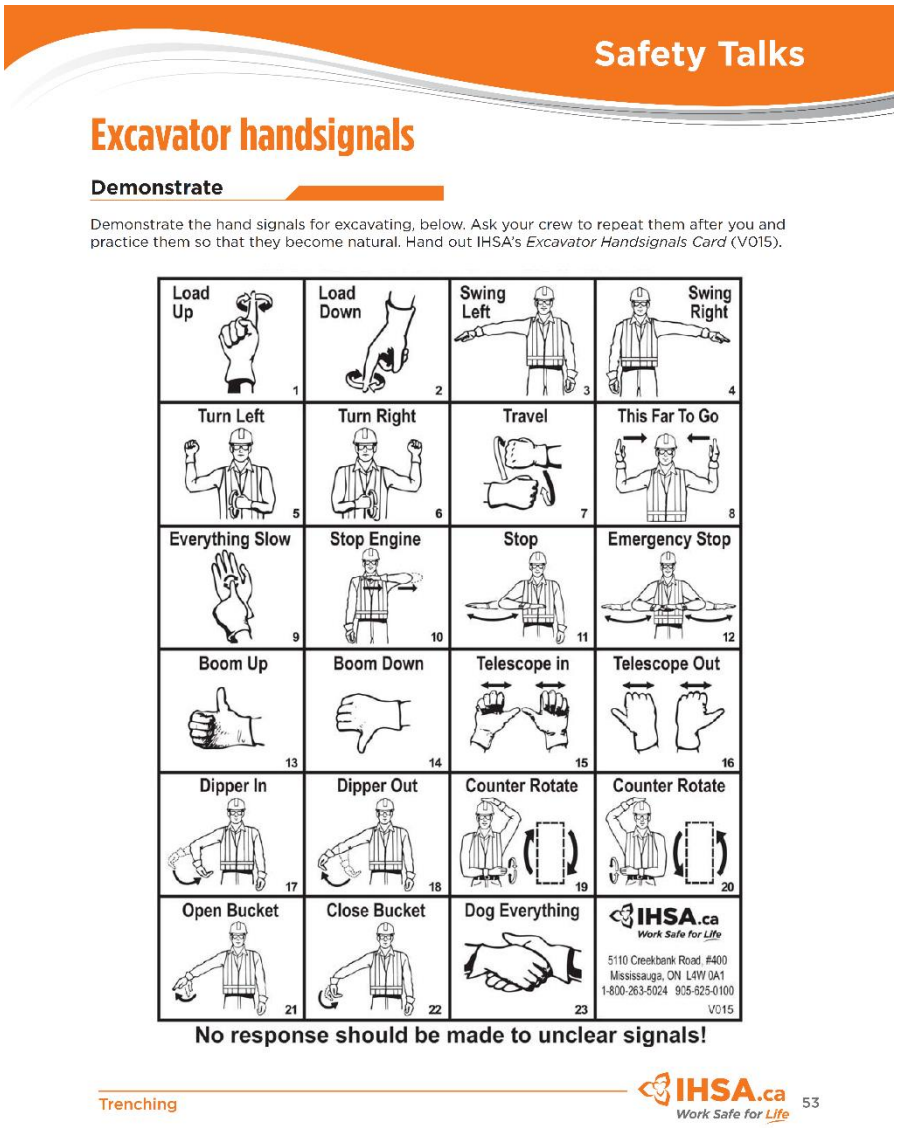
- **Methane is detected at 5% or higher of the Lower Explosive Limit (LEL), or**
- **Hydrogen sulfide is detected at a concentration of 5 parts per million (ppm).**

The excavation will be given time to off-gas and conditions will be reevaluated prior to re-commencing work.

9.7 Mobile Equipment and Falling Loads

Employees shall not be permitted to work under overhead loads. The Competent Person will evaluate the effect of nearby loads and heavy equipment operation on sidewall stability. Suitable barricades will be erected as considered necessary to protect personnel working in excavations.

The use of mobile equipment near an excavation will be permitted only when the operator has a clear, unobstructed view. Barricades, hand signals, berms or other effective barricades will be established if view to the excavation is obscure. A communication protocol will be established prior to commencing work. Example hand signals are included below:



All excavated or loose materials will be positioned a minimum of two feet from the edge of the excavation and personnel will not work on the faces of sloped or benched excavations while other personnel are working at lower levels unless adequate barriers are employed.

Wells, shafts, pits, etc. will be protected with appropriate physical barricades when unattended. Excavations will be backfilled as soon as possible upon completion of work.

9.8 Requirements for Protective Systems

Protective systems are required in all trenching and excavation activities unless:

- the trench or excavation is in stable rock, or
- the trench or excavation is less than 5 feet in depth and inspection by the Competent Person indicates no potential for cave-in.

Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system. A registered Professional Engineer must design all protective systems in excavations greater than 20 feet in depth.

9.8.1 Sloping and Benching Systems

For excavations less than 20 feet in depth, the Competent Person will design sloping or benching protective systems based upon the following permissible options:

- Slope the excavation at an angle not steeper than one and one-half horizontal to one vertical (34 degrees as measured from horizontal). Slope configurations will conform with the slopes shown for Type C soil in Appendix B of OSHA 29 CFR 1926.652.

- Slope the excavation in accordance with the maximum allowable slopes and configurations identified in OSHA 29 CFR 1926.652, Appendices A and B.

- Sloping or benching systems may be designed using other tabulated data such as tables and charts providing:
  - The data is documented in written form.
  - The parameters in the data which affect the selection of the sloping/benching system are identified.
  - A copy of the tabulated data is present at the job site bearing the signature of the registered Professional Engineer responsible for approving the data used for the design.

9.8.2 Support, Shield and Other Protective Systems

The design of timber and aluminum shoring in trenches must be prepared in accordance with the following:

- Timber shoring systems will comply with the design requirements contained in OSHA 29 CFR 1926.652, Appendices A and C.

- Aluminum hydraulic shoring systems will be used in accordance with manufacturer's tabulated data. If tabulated data is not available, the use of aluminum hydraulic shoring systems must be in accordance with OSHA 29CFR 1926.652, Appendix D.

- Specifications, recommendations and limitations issued by the manufacturer must be used in the design and application of the system.

- Shield systems (such as trench boxes) may be utilized so long as they are designed to withstand forces calculated for the full depth of the excavation.

- All support, shield or other systems not utilizing the above methods must be designed and approved by a registered Professional Engineer. A copy of the design bearing the signature of the registered Professional Engineer who approved the system design must remain at the job site during construction.

9.9 Training

Personnel required to design, oversee or enter trenches or excavations will receive training in the requirements of OSHA 1926.651--1926.652 prior to initial job assignment. Training will consist of videotape training presentations, prepared pamphlets/handouts, in-house safety sessions or a combination thereof. Training will be documented.

10.0 SITE CONTROL

An exclusion zone, contaminant reduction zone and a support zone will be established whenever project activities require Level C or Level B personal protective equipment. Defined access and egress points will be established, and personnel will enter only through those points.

As permitted by site topography, the area within a 50-foot radius of a drill rig, prove unit or excavation equipment be considered the site exclusion zone. Only those personnel designated by the Project Manager/SSO are allowed to enter the Exclusion Zone. Where practical, or where their use will prevent public injury, temporary signs or barricade fencing will be established to define the Exclusion Zone. No smoking is permitted on site.

If unauthorized personnel attempt to enter the exclusion zone, the SSO will verbally inform the individual(s) to leave the project site. If unauthorized individuals refuse to leave the exclusion zone or are considered in danger or pose danger to project personnel, the SSO will cease project activities (i.e., shut down drill rigs, excavation equipment, etc.) and notify the client representative or the local police of the situation. Site activities will not resume until unauthorized personnel have left the project site.

11.0 AIR MONITORING AND SITE ACTION LEVELS

This air monitoring protocol is designed to prevent personnel exposure to airborne contaminants in excess of established permissible exposure limits. The results of field air monitoring will be used to determine the adequacy of initial personal protective equipment selection. Air monitoring equipment required for petroleum-contaminated sites will include the following:

11.1 Combustible Gas Indicator

Task Leaders will be knowledgeable in the operation of a combustible gas indicator (CGI). A manual on the operation of the CGI and the appropriate calibration kit will be mobilized to the project site with the instrument. The CGI will be calibrated to 50% LEL methane calibration gas under field conditions each day prior to use. Task Leaders are instructed to consult the manufacturer's specifications for appropriate calibration gas and calibration techniques.

CGI readings will be taken at the bore hole and in the work zone during advancement of each soil boring. If CGI readings at the bore holes exceed 5% of the Lower Explosive Limit (LEL), discontinue drilling and allow the boring to vent. Eliminate any possible ignition sources in the vicinity. After approximately 5 minutes, repeat CGI reading. If CGI readings have fallen below 5% LEL, drilling may proceed with caution and continuous combustible gas monitoring. If CGI readings fail to move below 5% LEL after venting for 10-15 minutes, establish fans to blow vapors away from hot parts of drill rig.

11.2 Photoionization Detector

Task Leaders will be knowledgeable in the operation of a photoionization detector (PID). A manual on the operation of the PID and the appropriate calibration kit will be mobilized to the project site with the instrument. Photoionization detectors will be calibrated with isobutylene calibration gas (100 parts per million [ppm]) under field conditions *each day* prior to use. Task Leaders are instructed to consult the manufacturer's specifications for appropriate calibration gas and calibration techniques.

A PID will be used to determine approximate hydrocarbon vapor concentrations in the BREATHING ZONE of site personnel. Continuous breathing zone air monitoring will be conducted during initial phases of intrusive activities (i.e., boring, excavation). If PID readings are less than 10 ppm, monitoring may be conducted at intervals of 15 minutes. If initial PID readings exceed 10 ppm, or if hydrocarbon odors become evident upon during auger advancement, continuous breathing zone air monitoring will be conducted.

If sustained PID readings in the breathing zone exceed 25 ppm, personnel will upgrade to respiratory protection. Personnel will remain in air purifying respirators until the photoionization detector readings in the breathing zone have fallen and stabilized below 25 ppm.

Respirators will be equipped with combination organic vapor/HEPA cartridges. If sustained breathing zone photoionization detector readings exceed 25 ppm, personnel will move to the upwind side of the project site and contact the Safety and Health Manager to report conditions and to discuss enhanced monitoring and personal protective equipment.

11.2.1 Site Action Levels (Photoionization Detector)

Level D/D Modified	Level C	Site Evacuation
< 25 ppm	> 25 ppm	> 300 ppm

The Action Levels indicated above are for air in the breathing zone and NOT applicable to vapor above containerized soil samples. The Action Levels are established to prevent exposure to airborne petroleum hydrocarbon vapors in excess of established exposure limits. Although the Action Levels indicated for Site Evacuation are within the protective capacity of the respirator cartridges specified below, personnel will evacuate to the UPWIND side of the site if the continuous breathing zone vapor concentrations exceed these limits. The SSO will contact the Corporate Safety and Health Manager for discussion and re-evaluation of personal protective equipment and air monitoring requirements if airborne contamination exceeds Site Evacuation Action Levels. In the event that site evacuation is required, a modification of this safety and health plan will be issued with contingencies for combustible gas monitoring and upgrading to Level B personal protective equipment.

11.3 Anemometer

Task Leaders will be knowledgeable in the operation of a hand held wind speed monitor. A manual on the operation of the weed speed monitor and the appropriate calibration kit will be mobilized to the project site with the instrument. Task Leaders are instructed to consult the manufacturer's specifications for appropriate calibration techniques.

As a precautionary measure, due to the possibility of encountering Regulated Asbestos-Containing Soil (RACS), the CABI shall monitor wind speeds once per minute for ten minutes every half-hour, using a hand-held wind meter; drilling operations shall be halted if wind speeds exceed 12 mph for more than 20 minutes or if winds gust to over 20 mph.

11.4 Engineering Control Measures

In an effort to reduce the concentration of organic vapors and/or methane in the work zone around the bore hole, high volume fans (>2,000 CFM) may be utilized at each proposed boring location where sustained photoionization detector or combustible gas indicator readings above the borehole exceed the action levels specified above. The SSO will determine the direction of the prevailing wind at each proposed boring location. The drill rig will be position perpendicular to the prevailing wind and the high volume fan will be established approximately 4 feet to the upwind of

the bore hole. Caution must be taken to maintain the fan at a distance adequate to prevent inadvertent contact by site personnel. The fan must be positioned such that vapors/landfill gases liberated during soil boring are directed DOWNWIND, and away from the operator and operator controls. Periodic photoionization detector monitoring of the breathing zone atmosphere will then be conducted to determine the adequacy of engineering control efforts and potential need for respiratory protection.

12.0 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The air monitoring regimen identified above will allow initial project activity to begin in LEVEL D personal protective equipment to include:

- Hard Hat
- Safety Footwear (ASTM spec; Impermeable or with outer impermeable covers)
- Nitrile or Neoprene Rubber Outer Gloves
- Nitrile Glove Liners
- Safety Eye Wear (ANSI Z-87 specification)
- Hearing Protection (if within 10 feet of drill rigs, concrete coring or other equipment which impairs normal conversation at < 5 feet.)
- Covid specific PPE – facial coverings, gloves, and social distancing.

If petroleum saturated soils and potential splashing conditions develop during the course of the assessment, personnel will upgrade to LEVEL D MODIFIED personal protective equipment. Level D Modified personal protective equipment ensemble consists of the above, plus:

- Laminated Tyvek Coveralls
- Tape Sleeves/Legs to Gloves and Boots

If air monitoring exceeds Action Level specified for upgrade to LEVEL C personal protective equipment, personnel will don:

- Full Face Air Purifying Respirator
- Equipped with Combination Organic Vapor/Acid Gas/HEPA Cartridges

Respirator cartridges will be changed daily prior to start of site activity.

13.0 DECONTAMINATION

Equipment decontamination is required on all sites with petroleum hydrocarbon impact. Personnel decontamination for projects below personal protective Level C will consist of washing off safety footwear, proper cleaning or disposal of outer and inner gloves and thorough washing

of face, arms and hands. For projects involving Level C personal protective equipment, a decontamination station will be established, and the following procedures enforced.

13.1 Personal Decontamination

Personnel will establish a decontamination station on the interface of the Exclusion Zone. A Contaminant Reduction Zone will be established and will extend 10 feet beyond from the decontamination station.

- Two Wash Tubs
- Scrub Brush
- Plastic Bags
- Water and Alconox Detergent

The wash tub on the exclusion zone side of the site will contain a solution of water and Alconox detergent; the second wash tub will contain clean rinse water. Personnel decontamination will consist primarily of detergent washing and rinsing of reusable exterior protective gear. Coveralls will be removed by turning the clothing inside out.

Personnel may not leave the contaminant reduction zone without proceeding through the decontamination sequence described below. The general decontamination sequence should be as follows:

- Wash work gloves, boots and polylaminated protective coveralls,
- Rinse work gloves, boots and coveralls,
- Remove tape at wrists and ankles,
- Remove protective coveralls,
- Remove respirator
- Dispose of spent cartridges; wash and rinse respirator
- Remove outer gloves
- Remove inner gloves

Expendable personal protective equipment will be placed in plastic trash bags, sealed and disposed of per client agreement. Decontamination solutions will be containerized or disposed of as arranged by Project Manager.

13.2 Equipment Decontamination

Decontamination of equipment will be performed to limit the migration of contaminants off-site. All equipment will be cleaned prior to site entry to remove grease, oil and encrusted soil.

Decontamination of large equipment will consist of physically removing gross contamination with shovels, brushes etc. followed by detergent and water high pressure wash with a clean water rinse. The Project Manager is responsible for determining if decontamination solutions must be containerized. If so, a decontamination sump or polyethylene sheeting and fluid containers will be mobilized and established in the decontamination area. Decontamination of hand samplers and similar small equipment will be performed at a designated location within the Contaminant Reduction Zone. Decontamination of such equipment will consist of detergent solution wash and clean water rinse.

13.3 Power Washer/Decontamination Safety

The operator should wear safety glasses or a face shield at all times during use of the power washer. Caution should be used while operating the washer to ensure that all Site personnel are out of the area.

14.0 SITE COMMUNICATIONS

Communication between personnel within the Exclusion Zone will be via verbal communication or hand signals. Visual contact between members of task teams should be possible throughout the course of project activities. Contact with the SSO will be through direct verbal communication. The following hand signals will be used by personnel wherever respiratory protection and/or equipment noise limit verbal communication.

Signal	Meaning
Thumbs Up	OK; all is well
Grab throat with both hands	Can't breathe
Shake head, thumbs down	NO, negative
Point right (when facing equipment operator)	Move/steer left
Point left (when facing equipment operator)	Move/steer right
Grab partner's wrist	Leave area immediately

15.0 EMERGENCY RESPONSE PROCEDURES

The Project Manager is responsible for obtaining and recording the following emergency information prior to site mobilization:

Location of Nearest Telephone: Terracon work truck/On field personnel

Nearest Hospital/Clinic: Presbyterian/St. Luke's Medical Center **Phone:** (303) 839-6000

Estimated Drive Time: 16 minutes

Directions From Site: (Attach a Site Diagram as an Appendix to this Plan):

Ambulance:	911
WorkCare (Managed Care Provider)	888-449-7787
Fire Department:	303-288-0835 (non-emergency)
Police:	303-288-1535 (non-emergency)
Poison Control Center:	1-800-222-1222
Project Manager:	303-454-5265 (J. Haas) 303-454-5250 (B. Williams)
Safety and Health Manager:	913-298-7353
Client Contact:	281-779-6645

15.1 Personal Injury

The SSO and at least one other individual on site will be appropriately trained to administer first aid and CPR. A certificate issued by the American Red Cross, National Safety Council or equivalent will be considered appropriate.

In the event of non-life threatening injuries such as minor cuts, burns, exhaustion, heat cramps, insect stings, etc., the affected employee will be removed to a safe location and appropriate first aid measures should be rendered. It is the responsibility of every employee to report all unsafe acts and incidents (equipment or facility damages as well as injury accidents) to their direct supervisor as soon as possible. Personnel who incur injuries not requiring immediate medical attention are instructed to call WorkCare at 888-449-7787. The affected supervisor will complete an Accident/Injury Investigation form within 48 hours of the incident, and forward it to their home office or enter it directly into Terracon's Automated Claims Management System. Details will be shared with the client and/or contractor as may be required by contractual agreement. A root cause analysis will be prepared by the affected Office Manager. All reports must include written recommendations of actions the office will take to prevent a recurrence of the incident.

For more serious injuries the Site Safety Officer or designee will summon an ambulance to the project site. No attempt will be made by Terracon personnel to move the victim, without the aid and/or instructions of qualified medical personnel.

Where air monitoring indicates the absence of toxic gases or vapors, the ambulance will be directed to the affected employee. If site conditions warrant and as time permits, the wheels of the ambulance will be decontaminated with high pressure wash. The SSO or designee will accompany the ambulance to the medical facility, and provide guidance concerning additional decontamination which may be required for the injured employee, ambulance or attendants.

Whenever an injury occurs on sites with contamination requiring personal protective equipment greater than Level D modified, a minimum of two employees will don appropriate equipment and proceed to the victim. An ambulance will be called immediately. If the extent of injuries permit, the injured employee will be removed to fresh air. Appropriate first aid will be administered.

If rescuers assess that the victim cannot be removed without a stretcher or other specialized equipment, the victim will be removed at the earliest possible moment by appropriately attired Terracon personnel with the direction and/or assistance of qualified medical response personnel. The injured employee will be immediately decontaminated and transported to the nearest medical facility. A crew member designated by the SSO will inform the ambulance crew of contaminants of concern and provide assistance with additional decontamination if required.

15.2 Evacuation and Shutdown Procedures

The SSO will establish and notify site personnel of emergency "rally" points. In the event of a site emergency, personnel will immediately exit the site and assemble at the designated rally point. Evacuation routes will be dependent on site topography and wind conditions. The routes will be selected and presented by the SSO daily prior to site activity.

If emergency evacuation becomes necessary, the SSO will sound the emergency alarm (e.g. support vehicle horn or compressed air horn). Personnel will safely shutdown all electrical and mechanical equipment and quickly proceed to closest designated rally point. The SSO will then account for each crew member on site.

In the event that a Terracon employee does not report to the designated rally point within 5 minutes of the evacuation alarm, the SSO will perform an immediate assessment of site conditions. If site conditions do not pose an immediate hazard to life or health, the SSO will initiate search and rescue efforts utilizing two crew members attired in appropriate personal protective equipment.

16.0 THERMAL STRESS

16.1 Heat Stress

Whenever ambient temperature exceeds 70 degrees F and personal protective equipment requirements are Level D or Level D modified, the following heat stress monitoring and preventive measures will be implemented:

- Mobilize at least one gallon of water for each field employee during each day of site activity.
- Periodically observe personnel for signs of heat stress (excessive perspiration, flushed skin, nausea, etc.).
- Move affected workers out of contaminant zones.
- Loosen protective clothing and permit them to rest.
- Have conscious, affected personnel drink at least one 8 oz. glass of cool water.
- Check pulse; personnel should not return to work until pulse rate is less than 90 beats/min.

16.2 Heat Stress in Level C/Level B PPE

In addition to the above precautions, the following procedures will be implemented whenever the ambient temperature exceeds 70° F and personal protective equipment requirements are Level C or above. Ambient temperature will be measured with a dry bulb thermometer and percent cloud cover will be estimated:

1.0 = No Clouds
0.75 = 25% Clouds
0.5 = 50% Clouds
0.25 = 75% Clouds
0.0 = 100% Clouds).

Calculate the adjusted temperature using the following formula:

ADJUSTED TEMPERATURE = 13 (% CLOUD COVER) + DRY TEMPERATURE

Rest regimens will be implemented at frequencies dependent upon adjusted temperature. Monitor pulse during each rest period.

Adjusted Temperature	Rest Period/Monitoring Frequency
90+	After 15 minutes
87.5-90	After 30 minutes
82.5-87.4	After 60 minutes

77.5-82.5	After 90 minutes
70.5-77.4	After 120 minutes

Employees will return to work only after their pulse rate is below 90. Fluid replacement will be encouraged during each rest period. The use of stimulants and alcoholic beverages in off hours should be discouraged to prevent heat related illnesses.

16.3 Cold Stress

Persons working outdoors in low temperatures are subject to cold stress, especially if the temperature is at or below freezing. Exposure to cold for a short period of time can cause severe injury to the surface of the body (frostbite), or result in profound general cooling, potentially resulting in clinical hypothermia and death. Areas of the body with high surface to volume area, such as fingers, toes, and ears are the most susceptible. In general, the body's response to cold stress progresses from frostbite to hypothermia. Recognition of the symptoms of cold stress is essential to worker protection when operating in low temperatures.

Utilize cold weather clothing available from Terracon's personal protective equipment vendor, including thermal hardhat liners, gloves, and footwear traction devices to prevent slips and falls on slick and icy walking surfaces.

17.0 TRAFFIC CONTROL

Worksites confront motorists with a situation they do not expect, cannot anticipate and find confusing. They also tend to create hazards with which the driver can collide. Worksites distract motorist's attention from the driving tasks and expose workers to oncoming traffic.

Some inadequate traffic control measures that have led to worksite traffic accidents include:

- Inadequate advance warning
- Inadequate and inappropriate signs and messages
- Confusing messages
- Inadequate guidance through the work zone
- Conflicting pavement markings
- Unprotected hazard such as shoulder drop offs

Whenever project sites under Terracon control will disrupt vehicle traffic or expose Terracon personnel to the hazards of vehicle traffic, (i.e., work on an active roadway, including shoulders) adequate traffic control measures must be implemented.

Terracon's preferred method for implementing traffic control is to request that clients assume this responsibility. Where clients refuse to assume responsibility, Terracon will attempt to sub-contract the service to a reputable traffic control firm. Terracon personnel with no training or

experience in traffic flagging or the placement of traffic control devices such as signs, barricades or flashers are prohibited from engaging in traffic control operations unless directed by a trained and experienced individual.

17.1 Project-Specific Traffic Control Requirements

The Project Manager will be primarily responsible for assuring that traffic control measures utilized on the various compressor station project sites (where applicable) are in accordance with Department of Transportation requirements. All Terracon personnel working within 10 feet of an active roadway will wear ANSI Class III traffic safety vests as the outermost garment. All Terracon field personnel will participate in site traffic control briefings with affected field representatives where requested.

18.0 MOTOR VEHICLE SAFETY

Terracon personal will be familiar with and abide by the rules and practices pertaining to motor vehicles identified in Section 2 – Rules to Live By. Vehicles must be periodically inspected in accordance with Terracon motor vehicle operations policies. Any vehicle found to be unsafe shall not be operated and shall be removed from service until it can be repaired or serviced and rendered safe. Driving at the maximum posted speed limit can be too fast for safety in some situations.

Drivers shall use good judgment and proceed at a speed suitable for the conditions of the vehicle, road, traffic, and weather. Vehicles are not to be moved until all passengers are properly seated inside the vehicle. All operators and passengers must use seat belts and shoulder harnesses, if the vehicle is so equipped.

Before driving, all windows should be cleared of any materials such as frost, mud, or dew that may reduce visibility. Drivers should not engage in distracting activities while a vehicle is in motion. The vehicle should be pulled over to the side of the road and stopped when performing activities such as dialing or using a mobile telephone or taking notes. If the phone rings while driving, let the cellular voice mail service take the call and listen to the message later when you are parked.

Vehicles should be properly parked. When possible, they should be parked so that no backing is required when leaving, unless doing so creates a greater hazard. Where backing is required when leaving a location, the driver shall walk around the vehicle prior to backing and inspect the area for any potential obstructions, or use a spotter. Hazard lights shall be utilized when parking on a road shoulder. Bridge load limits should be reviewed, and a preapproved route established prior to transporting heavy equipment over county road bridges.

Items carried inside the vehicle should be secured to prevent them from being thrown about in event of emergency braking or sharp maneuvers. Items that cannot be secured must be carried

in an enclosed trunk or luggage compartment that is physically separated from the passenger area.

All large tools should be carried outside the cab of the vehicle and be properly secured. All fittings, tools, supplies, equipment, and other cargo carried on cargo beds or in the back of trucks must be properly secured and restrained.

ACKNOWLEDGMENT OF INSTRUCTION

I understand this project involves the investigation of a project site with potential petroleum hydrocarbon contamination. I have read this Safety and Health Plan and have received instructions for safe work practices, personal protective equipment and air monitoring requirements. I further understand that if I encounter unanticipated contamination or site conditions I am to leave the site and immediately notify the Project Manager and Corporate Safety and Health Manager of the conditions observed.

PROJECT NAME: Triangle Logistics Center - 48th Avenue between Forest and Ivy Street.
TERRACON JOB #: 25207313

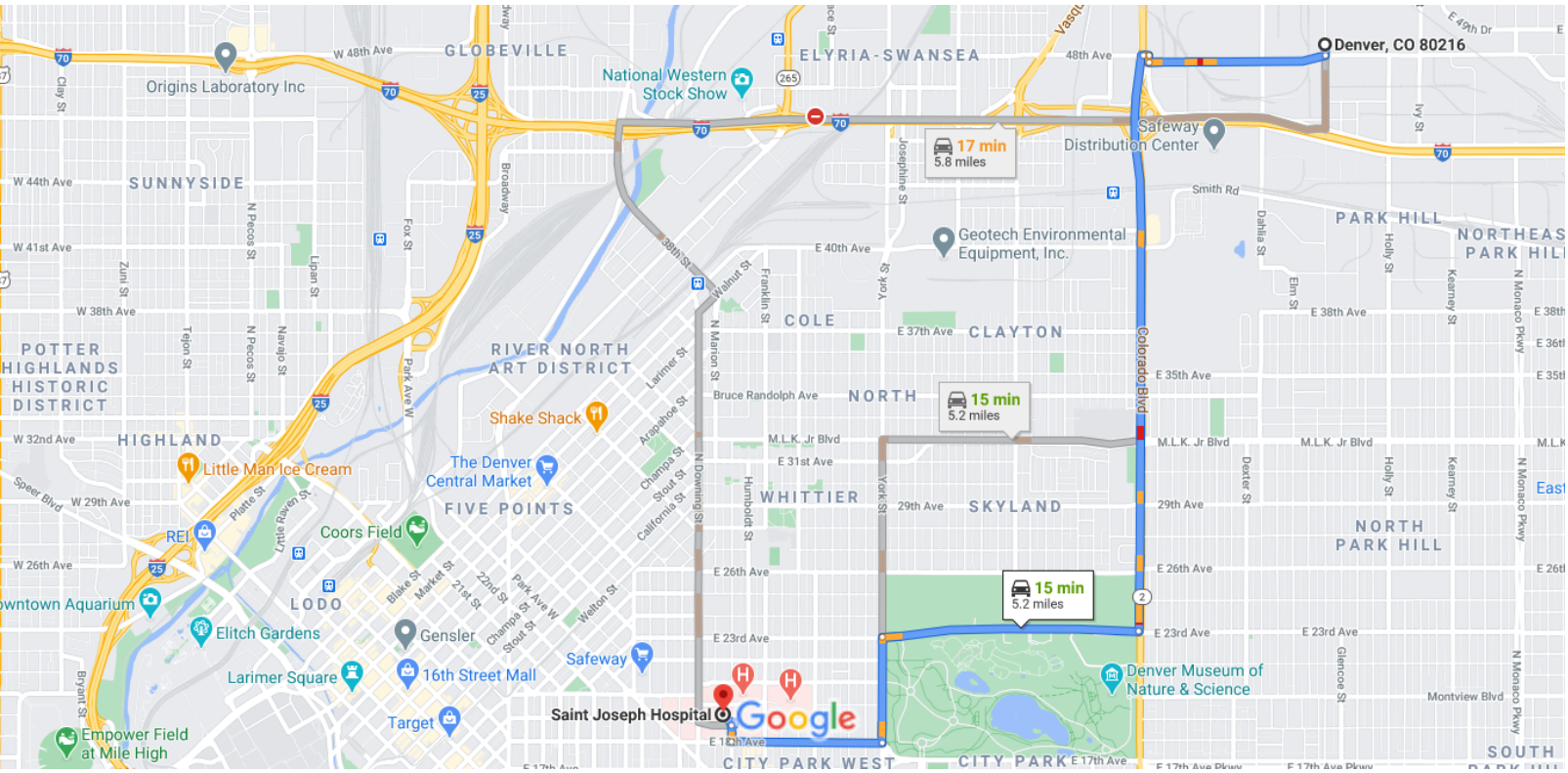
Name (Please Print)	**Signature**	**Date**

PERSONAL PROTECTIVE EQUIPMENT UTILIZED:

__X__ **LEVEL D** _____ **LEVEL D MOD.** ____ **LEVEL C**

Safety briefing performed by: _____ **Date:** _____

Google Maps Denver, Colorado 80216 to Saint Joseph Hospital Drive 5.2 miles, 15 min



Denver

Colorado 80216

1. Head south on Forest St toward E 48th Ave

10 s (217 ft)

Continue on E 48th Ave. Drive from Colorado Blvd and E 23rd Ave to Denver

14 min (5.1 mi)

2. Turn right at the 1st cross street onto E 48th Ave

0.7 mi

3. Turn right onto E 46th Ave

141 ft

4. Turn left at the 1st cross street onto E 48th Ave

102 ft

5. Turn left at the 1st cross street onto Colorado Blvd

Pass by ACE Cash Express (on the right in 1.4 mi)

2.3 mi

6. Turn right onto E 23rd Ave

1.0 mi

7. Turn left onto York St

0.4 mi

8. Turn right onto E 18th Ave

0.6 mi

9. Turn right onto N Lafayette St

341 ft

10. Turn right

Destination will be on the right

26 s (236 ft)

Saint Joseph Hospital

1375 E 19th Ave, Denver, CO 80218

Materials Management Plan for Geotechnical Services

Proposed Triangle Logistics Center
48th Avenue and Ivy Street
Commerce City, Adams County, Colorado

April 19, 2022
Terracon Project No. 25207313
Revision 2

Prepared for:
CA Industrial Holdings, LLC
Chicago, Illinois

Prepared by:
Terracon Consultants, Inc.
Wheat Ridge, Colorado

TABLE OF CONTENTS

EXHIBITS

APPENDICIES

MATERIALS MANAGEMENT PLAN FOR GEOTECHNICAL DRILLING
TRIANGLE LOGISTICS CENTER
48TH AVENUE AND IVY STREET
COMMERCE CITY, ADAMS COUNTY, COLORADO

April 19, 2022
Terracon Project No. 25207313
Revision 2

1.0 INTRODUCTION

The site consists of approximately 65.5 acres corresponding to Adams County Assessor parcels 0182317300008 and 0182317300029. The approximately triangular shaped area is bounded by 48th Avenue to the south and a Union Pacific railroad right-of-way to the north. The western edge of the site is defined by a line extending along Forest street from the southwest corner of the site north to the intersection with the railroad ROW. Ivy Street separates the two parcels and transects the site south to north. The location of the site is depicted on Exhibit 1, which was reproduced from a portion of the USGS 7.5-minute series topographic map. The site and adjoining properties are depicted on the Site Diagram, which is included as Exhibit 2.

The site was historically used as a municipal landfill and site grounds consist of an engineered soil cover over refuse. An active landfill gas collection system is present at the site. The collection points are reported to discharge to a flare system located on the western adjoining property. Additional information is presented below.

This Materials Management Plan (MMP) has been prepared to facilitate geotechnical-related services (i.e., drilling, grout injection, and test trenches) activities being performed by Terracon, CA Industrial Holdings, LLC (CAI), and Triangle Logistics, LLC, subcontractors at the site. This MMP will accompany the final geotechnical Work Plan that is being developed by Terracon for the site based on review of the proposed redevelopment layout being prepared by Kimley Horn and input from the redevelopment team. It is anticipated that this MMP will be amended as site redevelopment activities and interaction with the Respondents (BFI Waste Systems of North America, LLC and BNSF Railway) evolve, more regulatory information and guidance is developed, and site construction methodologies are understood. The site is currently in its preliminary planning stages.

2.0 SITE BACKGROUND

Terracon prepared a Phase I ESA for the site for CA Industrial Holdings, LLC, draft report dated August 12, 2020, in general accordance with ASTM E1527-13. The purpose of the Phase I ESA was to review

historical records, document past land uses on the site and adjoining properties and identify possible environmental concerns regarding the site.

Based on a review of historical information, the site appears to have been undeveloped/vacant land from the 1890s until the 1930s. The north-central portion of the site west of Ivy Street was improved with small structures, and activity was apparent in the southwestern portion of the site from 1937 through 1963. The site was officially utilized as a municipal landfill from 1968 to 1975, although aerial imagery suggests unofficial landfilling operations began a year earlier in 1967. Landfilling operations appear to have concluded in 1975 and the site has remained vacant through present day.

Adjoining properties were largely undeveloped to the south and west until the 1970s before being developed for commercial/industrial use. The northern adjoining properties appear to have been developed for agricultural use around the 1930s and was converted to commercial/industrial use starting in the late 1970s. Several historical property uses of concern were identified upgradient of the site to the west and south. Groundwater contamination has either been documented, or is suspected to have occurred, at these properties. However, groundwater impacts at the site are considered a Controlled Recognized Environmental Condition (CREC), based on the site's groundwater use restriction and the operation of the landfill gas extraction system, which is expected to also address potential soil gas impacts from the groundwater plume. See below for more information.

Based on review of regulatory information, the Sand Creek Superfund site consists of four principle units, including the former, L.C. Corp, former Colorado Organic Chemical Co., former Oriental Refinery, and the 48th and Holly landfill. The subject site is located within the bounds of the 48th and Holly landfill. The former L.C. Corp, Colorado Organic Chemical, and Oriental refinery facilities are located northwest and downgradient of the site. In 1982, the 48th and Holly landfill along with the three adjacent chemical production or storage facilities, were listed by the EPA as the Sand Creek Superfund site. Six Operable Units (OUs) were identified for the Sand Creek Superfund site of which two, OU3 and OU6 apply to the landfill.

OU3 includes air, soil and water (both surface water and groundwater) contamination in the vicinity of the landfill, and OU6 includes gaseous emissions from the landfill. Response actions established as part of the Record of Decision (ROD) for OU3 and OU6 included preventing dermal contact with landfill contents through the maintenance of an engineered soil cover, restricting the use of underlying groundwater through the establishment of an environmental covenant, and collecting and controlling gaseous landfill emissions through the installation and maintenance of an active landfill gas collection system. Methane gas was detected during construction activities on a nearby water utility project and initial investigations led by the Colorado Department of Public Health and Environment (CDPHE), Tri-County Health, and South Adams Fire district identified the 48th and Holly site as a source of regional landfill gas impacts. Initial passive and active landfill gas vent systems were installed between 1978 and 1981, and in 1991, Burlington Northern Railroad [now Burlington Northern Santa Fe (BNSF) Railway Company] and BFI (later Republic Services, Inc., now BFI Waste Systems of North America, LLC), the Respondents, replaced the early landfill gas collection systems with the current landfill gas collection system.

According to EPA investigation documents, landfill disposal operations at this facility began around 1967 and the facility officially operated as a municipal waste landfill from 1968 until 1975. According to the landfill refuse thickness investigation conducted by Harding Lawson Associates (HLA) in August 1991 and reported to EPA as part of the Remedial Investigation Summary Report for the Sand Creek Superfund site, refuse was encountered at the site in thicknesses ranging from approximately 14 feet along the northern site boundary to approximately 40 feet below ground surface (bgs) along southern property line. Refuse was reported to include construction debris as well as commercial and residential refuse. Hazardous materials were not documented to have been disposed of in the landfill; however, they were suspected to be present by EPA investigators. Terracon notes that native soils present beneath the fill material do not appear to have been characterized as part of the EPA led investigations. Refuse thickness, landfill gas production, and groundwater quality assessments appear to have been the primary focus of site characterization activities.

The groundwater monitoring program established as part of the response actions has included the collection of groundwater data from monitoring points both upgradient and downgradient of the site since 1986. Based on Terracon's review of historical groundwater data presented in the Fifth 5-year Review Report prepared by ERM in 2015, concentrations of contaminants of concern (COCs) in groundwater at the site are generally declining with the VOC analyte PCE still currently exceeding regulatory standards in two monitoring wells, upgradient monitoring well FIT-MW3, located on the northern (downgradient) side of the former Chemical Sales Corp Superfund Site, and downgradient monitoring well L-15 located on the northerly adjoining Shamrock Foods facility. The reviewed reports attribute the chlorinated solvent contamination to off-site upgradient sources, particularly the adjoining former Chemical Sales Corp facility and landfill leachate is not considered to be negatively affecting regional groundwater quality.

Landfill gas production and the effectiveness of the landfill gas extraction system remedy are monitored through gas monitoring points installed at the site as well as at the flare station located on the western adjoining parcel. Landfill gas concentrations are reported to have declined over time from approximately 35% methane by volume in 1991 to 25% methane by volume in 2015. Uncontrolled, the reported concentrations still represent potentially explosive conditions, and the 2015 5-year review report recommended continued operation of the landfill gas collection system.

Terracon understands that the Sixth 5-Year Report has been prepared. Terracon reviewed current monitoring data which has been incorporated as necessary in Sections 7.2 and 7.3.

The Sand Creek Superfund site was removed from the NPL in December 1996 but both the CDPHE and the EPA retain statutory authority and regulatory oversight for the property. Both real estate parcels associated with this ESA site are subject to Environmental Covenants. The Covenants refer to the ROD and include language specific to continued operation of the landfill gas extraction system and prohibiting use of the property until methane is no longer considered a threat. The Covenants also require notification to CDPHE for its approval of modification requests. The impacts from historical landfill activities, considering the Covenants and other restrictions outlined in the ROD, are considered a CREC to the site.

The former Chemical Sales Corp. Superfund site is located upgradient of the eastern portion of the site and has been identified as the likely off-site source for chlorinated solvent contamination in groundwater beneath the site. This facility has been subject to regulatory action since the 1980s and is considered a CREC with respect to the site due to the groundwater use restriction imposed by the ROD related to historical landfill activities and the requirement to continue operation of the landfill gas extraction system at the site, which is expected to also address potential soil gas impacts from the groundwater plume.

Several additional regulated facilities were identified upgradient of the site, some of which correlate to the historical uses of concern noted above. Groundwater contamination has either been documented or is suspected to have occurred at these properties. However, groundwater impacts at the site are considered a CREC, based on the site's groundwater use restriction and the operation of the landfill gas extraction system, which is expected to also address potential soil gas impacts from the groundwater plume.

3.0 PARTIES INVOLVED

It is Terracon's understanding the following parties are, or may be involved, with the site:

Party	Contact (subject to change)	Role
CDPHE: Brownfields Program and Voluntary Cleanup Program	Mr. Fonda Apostolopoulos fonda.apostolopoulos@state.co.us Mr. Kyle Sandor kyle.sandor@state.co.us	State Regulatory
CDPHE: Superfund and Site Assessment Unit	Ms. Colleen Brisnehan colleen.brisnehan@state.co.us	State Regulatory
EPA	Mr. Sairam Appaji appaji.sairam@epa.gov	Federal Regulatory
Tri-County Health Department	To be determined 303-288-6816	County Regulatory
BFI Waste Systems of North America, LLC	Ms. Victoria Warren vwarren@republicservices.com	Respondent
BNSF Railway Company	Mr. Mike Makerov Mike.Makerov@BNSF.com	Respondent
CA Industrial Holdings, LLC	Mr. Joe Trinkle jtrinkle@ca-ventures.com	Developer
LC Development Consultants LLC	Mr. Lynx Chan lynx.chan@lcdevcon.com	Developer's Consultant
Triangle Logistics Center, LLC	Mr. Michael Podboy mpodboy@ca-ventures.com Mr. Joe Trinkle jtrinkle@ca-ventures.com	Owner

Terracon Consultants, Inc.	Mr. Brian Williams Brian.Williams2@terracon.com Mr. Mark White Mark.White@terracon.com Mr. John Haas John.Haas@terracon.com	Developer's Environmental and Geotechnical Consultant

4.0 INTENDED FUTURE USE

As of the date of this MMP, it is Terracon's understanding that CAI plans to redevelop the property. The proposed development is composed of a commercial logistics center consisting of five buildings and associated drives, parking areas, loading docks, and underground utilities. The initial proposed redevelopment layout' as prepared by Kimley-Horn, and showing the locations of the first geotechnical soil borings advanced at the site, is included as Exhibit 3. This exhibit also depicts the location of known landfill gas extraction system components in relation to proposed site infrastructure. It should be noted that Exhibit 3 shows the first redevelopment layout iteration. A more updated version of the proposed site redevelopment layout with site features and the exiting LFGES is shown on Exhibit 5.

5.0 PLANNED VOLUNTARY REMEDIATION

CA Industrial Holdings, LLC is currently in preliminary planning and redevelopment stages. It is Terracon's understanding that redevelopment at the site will include coordination with the Respondents (BNSF Railway Company and BFI Waste Systems of North America, LLC), as well as multiple State Agencies, the Tri-County Health Department, and the EPA as noted in Section 3.0. At a minimum, individual vapor mitigation systems are anticipated to be designed and installed for each building constructed at the site. This assumption is based on Terracon's experience with CDPHE and the Tri-County Health Department on redevelopment projects at historical landfill properties. It is also anticipated that municipal solid waste and other non-hazardous and/or hazardous waste (i.e., petroleum contaminated soil, drums, containers, waste tires, etc.) could be encountered during site redevelopment.

6.0 EXPOSURE PATHWAY EVALUATION

6.1 Soil Pathways

As noted in Section 2.0, an engineered soil cover was constructed over the landfill to prevent dermal contact with landfill contents. Consequently, it is reasonable to assume that the dermal contact soil exposure route will be completed during geotechnical drilling and trenching to be conducted at the site. In addition, given the heterogenous nature of landfill materials and time period the on-site landfill operated, exposure routes related to soil ingestion and inhalation could also be completed during drilling or trenching.

6.2 Groundwater, Surface Water, and Sediment Pathways

According to the Operation and Maintenance Report No. 39, Remedial Design/Remedial Action, 48th and Holly Landfill, Commerce City, Colorado (ERM, 2020), groundwater exists at depths ranging from approximately 9 to 66 feet bgs, with concentrations of PCE and trichloroethene (TCE) exceeding their respective Colorado Groundwater Quality Standards. As water bearing zones are expected to be encountered during advancement of geotechnical soil borings, the groundwater exposure pathway will be, or will reasonably anticipated to be, completed. Surface water and related sediment were not observed during the Phase I ESA site reconnaissance; thus, these pathways are considered not completed. It should be noted that encountering groundwater during trenching isn't anticipated.

6.3 Vapor Inhalation Pathways

According to the Operation and Maintenance Report No. 39, Remedial Design/Remedial Action, 48th and Holly Landfill, Commerce City, Colorado (ERM, 2020), the average methane concentration as last measured (2019-2020) at the blower inlet port was approximately 24% volume in air. In addition, hydrogen sulfide and VOCs may also be present in the subsurface due to the documented groundwater contamination and anaerobic decomposition of landfill material. As such, the vapor inhalation exposure pathway will be, or will reasonably anticipated to be, completed.

7.0 GEOTECHNICAL DRILLING ACTIVITIES

Terracon personnel will be returning to the site to provide additional geotechnical services for the project. Terracon personnel will advance an additional 33 design level geotechnical soil boring at the site (see Exhibit 4). Terracon personnel will also perform oversight of the injection of low mobility grout (LMG) in four pilot test areas of the site (Exhibit 5). Keller North America will perform the LMG pilot test program to evaluate ground conditions at the site. The grout testing program will evaluate required injection pressures, grout volumes, drilling conditions, hole spacings, depth, and ground and landfill reactions. More information concerning the LMG injection program is provided in Section 8.0 and Appendix A. These geotechnical services will provide additional geotechnical and landfill material date/information to be used in future foundation and building design. These activities are discussed in more detail below.

It should be noted that the number of soil borings to be advanced at the site could increase or decrease based upon several factors including review of the draft preliminary redevelopment plans, preliminary geotechnical soil boring data, and historical documents, and geotechnical information used for design evaluation.

7.1 Landfill Gas Exposure Monitoring Procedures

Geotechnical soil borings are anticipated to be drilled to 60-70 feet bgs to obtain useable geotechnical soil data. Actual depths may vary based on the depths of landfill material at each soil boring location. Soil borings will be advanced using hollow-stem augers which will penetrate household waste,

construction debris, water bearing zones, and general undocumented landfill refuse. Preliminary design and design level geotechnical soil boring locations are shown on Exhibits 3 and 4, respectively.

As landfill material is expected to be encountered, Terracon personnel will prepare a Site-specific Health and Safety Plan (HASP) to facilitate safe drilling activities at the site. The Site-specific HASP will include, among other items, guidance on the use of personal protective equipment and requirements to monitor the atmosphere in and around the borehole/trench location while drilling/trenching to evaluate for the presence of methane, hydrogen sulfide, and VOCs. Personnel will also be equipped with personal hydrogen sulfide detectors. Drilling/trenching will be suspended if methane concentration is continuously measured at 5% or higher of the Lower Explosive Limit (LEL) as measured within 3 feet of ground surface, or if hydrogen sulfide is detected at a concentration of 5 parts per million (ppm). The borehole/trench will be given time to off-gas and conditions will be reevaluated. It is possible that additional venting or engineered controls may be required, or the interior of the augers may be flooded with drilling fluid, or a particular boring/trench may be abandoned and relocated. Is should be noted that the landfill gas monitoring procedures summarized in Section 7.1 and the Site-specific HASP will also be used to monitor ambient air quality conditions during the performance of work summarized in Section 8.0.

7.2 Soils and Landfill Materials Management

As the site is a historical landfill, investigative derived waste (IDW/auger cuttings/excavated material), anticipated to be composed of soil and landfill refuse, will be containerized for characterization and off-site disposal. Terracon personnel will work with the transporter and receiving landfill to establish a waste profile based on laboratory testing of the generated IDW. IDW will be placed into 55-gallon steel drums or a roll-off container provided by the receiving landfill. The containerized IDW/landfill material will be properly staged in a centralized location portion of the site that can be accessed by a waste transporter. Further discussion concerning identification, characterization, and disposal of IDW/landfill material is presented in Section 9.0 of this MMP.

It should be noted that if drill cuttings do not contain refuse, rather only native soils, the soils will be placed back into the boreholes provided field screening and observations do not indicate the possibility of contaminant impacts.

7.3 Groundwater Management

Production of groundwater is unlikely to occur during drilling due to the depth of the static groundwater aquifer at the site and drilling methodology. The production of groundwater is also not anticipated to occur during the performance of the LMG injection program or trenching summarized in Section 8.0. If groundwater production occurs while performing onsite work, it will be containerized for characterization and off-site disposal. Terracon personnel will work with the receiving landfill to establish a waste profile through analytical testing. Groundwater will be placed into 55-gallon polyethylene drums, which will be relocated from each boring location to a portion of the site that can be accessed by a waste transporter. Alternately generated groundwater may be applied to landfill material generated during drilling, LMG

injection, and/or trenching that is being temporarily stored in 20-cubic yard roll-offs pending characterization and future off-site disposal.

7.4 Drilling Equipment Decontamination

The general contractor and all subcontractors shall verify their equipment is free of contamination prior to mobilization to the jobsite. Decontamination of drilling equipment will consist of physically removing gross contamination with shovels, brushes, or similar tools followed by detergent and water high pressure wash with a potable water rinse. A temporary decontamination pad will be constructed that will allow for the containerization of decontamination fluids, if generated, for off-site disposal. The decontamination pad components will also be containerized for off-site disposal. Decontamination-related IDW will be containerized in 55-gallon drums pending characterization and off-site disposal.

7.5 Abandonment of Geotechnical Soil Borings

Soil borings will be abandoned per 2 CCR 402-2, Rule 16 Standards for Plugging, Sealing, and Abandoning Wells and Boreholes. It is Terracon's understanding that the current landfill cap is 2 feet thick. To comply with the requirements of 2 CCR 402-2, Rule 16.3, Terracon anticipates abandoning the upper 5 feet of each boring by filling it with grout, which appears to be more conservative than the 2 feet of required cover.

8.0 LOW MOBILITY GROUT INJECTIONS AND TEST TRENCHES

8.1 Low Mobility Grout Injection Plan and Procedures

A low mobility grout (LMG) injection program has been proposed as the most practical geotechnical application for ground improvement and building slab support for the proposed site buildings. As such, CAI has subcontracted Keller North America (Keller) to perform a LMG injection pilot test program to better evaluate ground conditions at the site. This pilot test program will provide grouting results which can be analyzed, tested, and used to verify assumptions concerning landfill conditions. The pilot test program will also be used to evaluate required injection pressures, grout volumes, drilling conditions, hole spacing, depth, and ground and landfill reaction.

Keller will provide crew, materials, and labor necessary for the grouting test program. Initially, a nominal 3" casing will be drilled or driven to termination depth of approximately 30 to 35 feet bgs (base of landfill material); grout will be pumped through the casing in the target zone using the below cutoff criteria. Remaining elevations will be pumped and pulled. Keller will do several test grout locations for each building (see Exhibit 5). The grout will be injected to a termination depth at, or just below, the landfill.

Grout will be pumped at each stage until one of the following refusal criteria is met:

- A grout pump gauge pressure of 150-300 pounds per square inch
- A grout volume of 5-9 cubic yards has been injected

- Ground heave or other undesired movement is observed

It should be noted that Terracon and Keller will coordinate with the RP's environmental consultants and use the referenced site exhibits to select the final locations of the LMG injection locations. Selected locations will be placed to avoid locations proximal to extraction wells and other subsurface features associated with the existing landfill gas extraction system. Keller's proposal including graphics is included as Appendix A.

8.2 Test Trenches Plan and Procedures

Following LMG injection and solidification, Terracon personnel will mobilize to the site to oversee a subcontractor (to be determined) perform test trenches in 2 of the 4 LMG pilot test areas. The test trenches will be utilized to visualize and confirm the horizontal and near surface vertical distribution of the LMG within the landfill. The dimensions of each test trench will be approximately 5- to 10-feet deep by 15- to 20-feet long by 3-feet wide. The trench excavations will be completed using a four-wheel drive backhoe. Excavation activities will generate approximately 8- to 22-cubic yards (cyds) of soil and landfill material from each excavation. Of this total, approximately 6- to 9-cyds of landfill cover material will be excavated, segregated, and stockpiled for future use as excavation backfill or reestablishment of the landfill cover. The remainder of the landfill waste material will be directly loaded into 20-cyd roll-offs after inspection, handling, segregating, stockpiling and pending waste characterization and disposal in accordance with applicable sub-sections of Sections 8.0 and 9.0 of this MMP. It should be noted that the two test trenches to be excavated will be chosen by Keller following the LMG injection event and review of generated data.

8.3 Landfill Waste Inspection and Characterization

As waste is excavated, it will be visually inspected for asbestos containing material (ACM) and special or hazardous wastes by trained personnel. These personnel will be Colorado certified asbestos building inspectors (CABIs) with ACM identification experience. ACM work and identified ACM will be managed in accordance with Section 9.2 of this MMP. Unless visual inspection dictates that special handling of waste should occur pursuant to Section 9.0 below, sampling will not be conducted for the soil or waste. Wastes requiring special handling will be profiled by laboratory analyses, manifested, packaged and transported accordingly.

8.4 Segregation, Stockpiling, and Handling

Only under the direction of trained Terracon personnel will handling of any wastes be completed. When handling is required, the following precautions will be used:

- Handling will be minimized whenever possible;
- When necessary, handling will be employed by mechanical means including the

use of site excavation equipment; Pressurized/swelling drums, suspected explosives, potential shock-sensitive materials, or other potentially dangerous items will not be handled until a person with appropriate experience with these situations have been consulted;

- All waste shall be isolated and covered immediately by placing them in steel roll-off containers or steel drums. If not containerized, wastes will be placed on 6-mil plastic sheeting and covered with plastic or tarp, until additional assessment has been completed;
- All stockpiles of waste will remain covered or containerized until final removal;
- The Contractor shall provide suitable signing, fencing and other warning labels meeting the regulatory labeling requirements as needed and to prevent contact with unauthorized personnel and the public;
- Berms or placement of temporary best-management practices (BMPs) might be needed around stockpiles of potentially contaminated material to prevent potentially contaminated stormwater runoff;
- When additional assessment of material indicates that the material does not meet applicable regulatory requirements for disposal as a non-hazardous waste, arrangements will be made for off-site disposal at a licensed facility;
- The wastes that are generated will be managed in accordance with applicable local, state and federal regulations and in general accordance with Section 9.0.

8.5 Heavy Equipment Decontamination

The general contractor and all subcontractors shall verify their equipment is free of contamination prior to mobilization to the jobsite. The backhoe or other large pieces of equipment that are required to work in landfill material and contaminated soil will be decontaminated within a decontamination station or catch basin, constructed out of 10-mil polyethylene sheeting and that is at least 12 inches deep. Primary decontamination of heavy equipment will consist of physically removing gross contamination with shovels, brushes, or similar tools followed by detergent and water high pressure wash with a potable water rinse, if needed. However, if ACM is encountered during the project, a high-pressure wash will not be used; rather, washing will be done under low pressure to avoid splatter. In addition, brushes will only be used with adequate wetting. All decontamination liquids and solids will be contained, and run-on and run-off shall be prevented. Rinsate/runoff will be collected and re-applied to landfill material being managed for offsite disposal or future removal. However, if ACM is encountered, areas where rinsate/runoff have been applied must be covered until removal is conducted or a permanent cover is placed.

If the decontamination pad is breached or otherwise not performing its intended function of collecting waste and providing a barrier to underlying material, then the decontamination pad will be repaired in a timely fashion. If the pad is damaged and potential contaminants of concern have, or may have, cross-contaminated underlying material, then over-excavation in the area of the damaged pad may be conducted.

If ACM is encountered during the project, all disposable PPE, tools and materials used during decontamination (booties, protective coveralls, plastic sheeting, latex gloves, brushes, brooms, etc.) will be disposed of as non-friable asbestos waste, at a licensed landfill. If no ACM is encountered, these items can be managed and disposed of as solid waste.

8.6 Fugitive Dust Control

Facility personnel will be responsible for controlling dust and particulate matter originating from winds, vehicular traffic, and operational equipment. During dry periods, the operator will have the option of using either chemical dust suppressants or water or both to minimize the amount of dust generated at the facility. The contractor shall visually monitor the site for dust control at the site boundary, and ensure compliance with 5 CCR 1001-1, Air Quality Commission Regulations.

Dust control practices that may be used to control air emissions and provide dust suppression at the site include the following:

- Cover inactive exposed faces of material with geomembrane, Visqueen™, or soil
- Seal the exposed soil by moisture conditioning and compacting
- Minimize the distance waste will be pushed in connection with excavation and loading and minimize drop heights when dumping or transferring materials.
- Treat surfaces with water spray, foam spray, hydro-mulch spray, or crusting agents
- Installation of additional fencing or other engineering controls to block wind.

A variety of control and monitoring methods are available. Material, equipment, and related items for monitoring and control will be in place at the site, or made readily available, prior to the start of any excavation activities. Excavation will be temporarily suspended during high wind events, defined as sustained winds of forty miles per hour (40 MPH) or greater, or gusts of fifty-five miles per hour (55 MPH) or greater, expected to persist for one hour or longer, as defined by the National Weather Service. When the conditions meet all the shutdown requirements, the Order for shutdown will be executed. The site will reopen as criteria are met. However, if ACM is encountered, the wind speed criteria and emissions control measures discussed in Section 9.2 will be used.

8.7 Reestablishing the Landfill Cover

Following excavation activities, clean backfill material and top soil (4-inches) will be imported and placed in the excavation in one-foot lifts and compacted to a naturally achievable density using the backhoe. Before the backfill material is imported, a composite soil sample will be collected from the borrow source and submitted for laboratory analysis by the methods listed below:

- VOCs (8260)

- SVOCs-Base Neutral & Acids (8270)
- RCRA metals (6010/7471)

After compaction and grading, the excavation areas will be seeded with a grass mixture appropriate for the site.

9.0 MANAGEMENT OF SPECIFIC WASTE TYPES

The following sections present guidelines for the management of IDW/auger cuttings and landfill material impacted, or potentially impacted, by contaminants of specific waste types.

9.1 Municipal Solid Waste

Municipal solid waste (MSW) is solid waste from residential, commercial, and industrial sources that does not contain hazardous wastes as defined in the Code of Colorado Regulations Hazardous Waste Act (6 CCR 1007-3 Part 260). As the site is a former landfill, it is likely that MSW could be encountered. If MSW is visually identified and comingled with the drill cuttings or encountered in trenches, the following shall be conducted:

- Segregate the MSW, place into 55-gallon drums and transport to a permitted solid waste landfill for disposal; or
- Load the MSW directly into containers (dumpsters) for transport to a permitted solid waste landfill for disposal.

9.2 Asbestos-Containing Material

As ACM could be encountered during drilling or trench excavation activities, this section outlines the applicable asbestos management procedures required by 6 CCR 1007-2 Section 5.5.7 and identifies the standard procedures for initiating subsurface work at the site, maintaining safe work practices during geotechnical-related drilling and trenching, and reducing the potential for asbestos fiber release from the work area.

Soil disturbing activities will be conducted in the presence of a Colorado Certified Asbestos Building Inspector (CABI) trained in accordance with Section 5.5.3.D of 6 CCR 1007-2, Regulations Pertaining to Solid Waste Sites and Facilities. Individuals involved in drilling or trenching operations in areas where asbestos has not been identified, but where there is reason to suspect that asbestos may be encountered, are required to complete 2-hour on-the-job asbestos-contaminated soil awareness training. This training will include site specific hazards and asbestos occurrences on, and in the vicinity, of the site. The training will provide the information necessary for individuals to perform their duties in compliance with the RACS management requirements of 6CCR 1007-2, Part 1, Section 5.5.3.A. This 2-hour awareness training will be conducted by a CABI.

As previously discussed, a Colorado CABI will be on-site during drilling and other earth disturbing activities to observe geotechnical soil boring advancement and test trench excavation activities and evaluate the properties of the generated IDW. If Regulated Asbestos-Containing Soil (RACS) is encountered, the CABI shall monitor wind speeds once per minute for ten minutes every half-hour, using a hand-held wind meter; drilling operations shall be halted if wind speeds exceed 12 mph for more than 20 minutes or if winds gust to over 20 mph. Should the CABI visually identify the presence of suspect ACM, the following steps will be implemented:

1. Drilling or trenching operations shall immediately be halted;
2. The CABI shall collect a bulk sample of the suspect material to be subsequently submitted to an accredited laboratory for analysis for asbestos content via Polarized Light Microscopy (PLM);
3. To facilitate continuous drilling operations, while awaiting results of bulk sample analysis, a regulated work area (RWA) of 10 feet surrounding the drilling portion of the drill rig shall be isolated using stakes and danger tape. Trenching activities may continue within an established RWA if the requirements of 6 CCR 1007-2 Section 5.5.7 are followed while awaiting the results of bulk sample analysis. Note that air monitoring is not required as long as the project duration is less than two days, or for longer project duration projects there are no adjacent receptor zones (i.e., no uncontrolled access within 150 feet of the RWA);
4. Only the CABI and 2-hour awareness trained personnel with appropriate personal protective equipment (booties, gloves and half-face respirators) will be permitted inside the RWA until all visible auger cuttings or excavated materials are properly bagged/drummed or otherwise containerized or covered. Crew members will not remove PPE until drilling or trenching of this location is completed;
5. If only a limited quantity of suspect material is encountered, the CABI will obtain a new 55-gallon drum and insert an asbestos waste bag liner to be positioned inside the RWA. If a large quantity of suspect material is encountered during trenching, the material will either be placed back into the trench and covered or will be placed on plastic sheeting and covered until the suspect material has been deemed not to be asbestos-containing or until it can be transferred to a lined container for offsite disposal. Suspected ACS waste shall not be intermixed with other IDW;
6. Thoroughly wet suspect material and surrounding landfill material/auger cuttings with chemically amended water using a garden sprayer. Do not soak soils, but adequately wet so that no dust (visible emissions) can be seen as soils are shoveled into waste container or removed using a backhoe;
7. If only limited quantities of suspect material are encountered, carefully shovel suspect debris and a minimum of 6 inches of surrounding soils (in all directions) into the ACM waste bag inside the 55-gallon drum;
8. If hand removal is conducted, once visible suspect debris and surrounding 6-inches of soils are packaged in the ACM waste bag, drilling or trenching at this location may continue using appropriate wetting techniques as soil disturbance continues (may require more water volume than can be generated by just a garden sprayer). However, once suspect debris is encountered, all material generated at this location will need to be packaged for disposal as ACM waste unless/until sample analysis results indicate the absence of asbestos;

9. Should further suspect debris be encountered, repeat procedures one through eight until drilling or trenching at this location is completed;
10. If large quantities of suspect material are encountered, either stop work and cover the material or remove the material while continuously spraying a water mist on the area being disturbed to ensure the material is kept adequately wet during disturbance. When conducting mechanical removal of suspect material, remove all suspect material and a minimum of three (3) linear feet of soil or other matrix material, in the direction(s) of planned excavation. The material may be placed directly into a lined container or placed on plastic sheeting and covered until the suspect material has been deemed not to be asbestos-containing or until it can be transferred to a lined container for offsite disposal. After removal of at least three (3) linear feet of material, CABI confirmation that the visible extent of suspect material has been removed from the excavation area, and CABI confirmation that the excavation equipment is free of any visible suspect material, the excavation may continue with adequate wetting;
11. Once drilling or trenching is completed at this location, decontaminate the auger or backhoe bucket and any other portions of the drill rig or backhoe that have come into contact with potentially contaminated soils using hand tools (shovels, nylon brushes while using amended water applied with garden sprayer, etc.). The decontamination of the auger, drill rig, or backhoe can be conducted on a 10-mil poly sheeting drop with bermed/raised edges or over/inside the 55-gallon drum waste container. However, all waste from this decontamination operation must be captured/containerized inside the 55-gallon waste drum lined with the asbestos waste bag(s). Decontamination is considered complete only after no visible soils or debris remain on the equipment/parts known to have come into contact with soils during drilling or trenching at this location.
12. Once decontamination is completed, CABI and other trained personnel can remove work area isolation barrier tape and PPE. The crew shall dispose of all PPE as asbestos-contaminated waste along with auger cutting or excavated material.

In the event that 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, 2019, are confirmed to be encountered during drilling or trenching, it shall be managed in accordance with this MMP as listed above 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 June 30, 2019.

9.3 Petroleum Contaminated Soil

If IDW/auger cuttings or excavated material appear contaminated with petroleum products based on visual observations (stains, colors, or sheen), odor, or elevated concentrations of volatile organic compounds (VOCs) using a photoionization detector (PID), these soils will be segregated, placed in 55-gallon drums or a roll-off container, and samples taken for characterization for off-site disposal, if necessary. Sampling, analyses, and disposition of soils based on analyses is discussed in Section 9.10.

9.4 Hazardous Waste

Laws governing management of hazardous waste are contained in the Colorado Hazardous Waste Act (C.R.S. 25-15-301-316) and the Colorado Hazardous Waste Regulations (6 CCR 1007-3). Solid wastes are considered non-hazardous unless the material is identified by name or it exhibits characteristics of ignitability, corrosivity, reactivity, or toxicity. Listed wastes are found in 6 CCR 1007-3 Part 261 Subpart D. More information on identifying hazardous waste streams can be found in the CDPHE Hazardous Waste Identification Guidance Document dates October 2008.

Generally, solid wastes are considered hazardous if they exhibit a hazardous characteristic such as toxicity, reactivity, ignitability, or corrosivity, or have been specifically listed as hazardous waste by the EPA (i.e., F-,K-,P-, and U-Listed). Listed wastes are specific wastes or mixtures of listed wastes including the following:

- Sludges from production of wood preservatives;
- Heavy metal-based pigments from production of paints;
- Distillation bottoms, still bottoms, heavy ends, spent catalysts, reaction by-products, organic residuals, and bag house dust from the production of organic chemicals;
- Brine purification muds, chlorinated hydrocarbon waste, wastewater treatment sludges, slag, and other residues from the production of inorganic chemicals;
- By-product salts, wastewater treatment sludges, filter solids, still bottoms, heavy ends, distillation residues, and bag house dust from the production of organic chemicals;
- Wastewater treatment sludges and spent carbon from the production of explosives;
- Wastewater treatment float, slop oil solids, heat exchanger sludge, tank bottoms, oi tank sediments, and spent catalysts from petroleum refining;
- Emission control dusts/sludges from iron and steel production;
- Residues from aluminum production;
- Emission control dusts/sludges from secondary lead production;
- Wastewater treatment sludge, distillation residues, and spent activated carbon from the production of veterinary pharmaceuticals;
- Wastewater treatment sludges from production of ink formulations; and,
- Wastewater treatment sludges, decanter tank sludges, tar storage tank residues, and process residues from coking operations.

Focus will be given to drill cuttings and excavated material that have a particle size gradation or consistency different from the native soils which could be from the afore mentioned solids/sludges. If drill cuttings or excavated materials appear contaminated based on visual observations (stains, colors, or sheen), odor, or elevated concentration of volatile organic compounds (VOCs) using a PID, these soils/materials will be segregated and placed in 55-gallon drums or roll-off container for characterization. Sampling, analyses, and disposition of IDW is discussed in Section 9.10.

9.5 Universal Waste

Hazardous waste includes universal waste such as batteries, pesticides, mercury containing switches and thermostats, and lamps. If drill cuttings or excavated materials contain these items in whole or parts, the cuttings/waste materials will be segregated (as discussed above). Sampling, analyses, and disposition of soils is discussed in Section 9.10.

9.6 Polychlorinated Biphenyl Waste

Polychlorinated biphenyls (PCB) are thermally stable and fire-resistant chemicals historically used in hydraulic fluids, heat transfer fluids, lubricants, and plasticizers. Additionally, PCBs were used in electrical equipment including transformers, capacitors, and fluorescent light ballasts. If IDW/auger cuttings or excavated materials containing fragments of these items are visually encountered during drilling or trenching, potential PCB wastes will be segregated, and auger cuttings/excavated materials will be containerized as discussed above. Sampling and analyses are discussed in Section 9.10.

Per EPA regulations, if analytical results show soil containing PCBs greater than 50 parts per million, the soil/waste materials will be containerized, stored, transported, and disposed of in accordance with Toxic Substances Control Act (TSCA) requirements. Permitted PCB disposal facilities in the region include the following:

- Clean Harbors Environmental Services, Inc. Incinerator in Kimball, Nebraska. This hazardous waste storage and treatment facility includes a thermal oxidation incinerator that provides disposal services for PCB wastes, including PCB liquids and solids.
- Lone Mountain Landfill in Waynoka, Oklahoma

9.7 Ash

Ash from incinerators and coal burning operations typically have elevated concentrations of metals. In addition, historically some landfilling operations included burning of waste materials to reduce waste volumes. Therefore, if ACM is encountered in the vicinity of ash there's a potential for the ash to be asbestos-containing. If intact ash is visually observed in auger cuttings/excavated materials or comingled with auger cuttings/excavated materials, it will be placed in 55-gallon drums or a roll-off container and sampled for characterization for disposal. Disturbance of any ash encountered in the presence of suspect ACM will be in accordance with the procedures outlined in Section 9.2. Sampling and analyses are discussed in Section 9.10.

9.8 Metal

There is the potential for scrap metal and metal fragments from materials within the landfill to be comingled with the auger cuttings or excavated materials. If pieces of metal are visually observed in drill cutting or excavated materials, it will be segregated and handled as MSW. Sampling and analyses of metal pieces will not be performed.

9.9 Waste Tires

Waste tires may be encountered during waste excavation. Waste motor vehicle tires and waste tires will be transported and disposed of in accordance with Section 10 of 6 CCR 1007-2. If tires are adjacent to ACM or RACS, they will be decontaminated prior to disposal.

9.10 Waste Characterization Sampling and Analyses

The volume of drill cuttings from the geotechnical investigation and number of samples for analyses for waste characterization is based on the following assumptions:

- Up to 33 soil borings will be advanced for the geotechnical investigation;
- Each soil boring diameter will be approximately four-inches;
- The depth of each soil boring will be approximately 60 feet below ground surface;
- Drill cuttings will be either drummed or place in a roll-off container for characterization.
- Two test trenches will be excavated following the LMP injection program.
- The dimensions of each test trench will be approximately 5- to 10-feet deep by 15- to 20-feet long by 3-feet wide.

The volume of IDW/drill cuttings ultimately will be based on the final number and depth of soil borings advanced at the site. However, 2-3 cubic yards of IDW is currently anticipated.

Excavation activities will generate approximately 8- to 22-cubic yards (cyds) of soil and landfill material from each excavation. Of this total, approximately 6- to 9-cyds of landfill cover material will be excavated, segregated, and stockpiled for future use as excavation backfill or reestablishment of the landfill cover. The remainder of the landfill waste material will be directly loaded into 20-cyd roll-offs after inspection, handling, segregating, stockpiling and pending waste characterization and disposal in accordance with applicable sections within Section 8.0 and 9.0 of this MMP.

Based on Terracon's experience with waste haulers and their respective requirements for soil analyses for decisions regarding receiving facilities, a composite soil sample can be prepared using samples from the containerized material and analyzed for the following parameters (method), at minimum, or as provide by the receiving facility:

- VOCs (8260)

- SVOCs-Base Neutral & Acids (8270)
- PCBs (8082)
- RCRA metals (6010/7471)
- Pesticides (8081)
- Herbicides (8151)
- Full TCLP (1311, various)
- Ignitability (various)
- Reactivity (various)
- Corrosivity (various)
- Asbestos [if encountered] (polarized light microscopy)

If results of the analyses show the soil or waste material to be non-hazardous, the IDW/waste material will be transported off site for disposal at an approved facility.

If results of analyses show soil/waste material to be hazardous, the drums will be manifested and transported off-site for disposal to an approved hazardous Subtitle C waste facility. Hazardous waste disposal facilities located in the region include:

- Clean Harbors Environmental Services, Inc. Incinerator in Kimball, Nebraska;
- Lone Mountain Landfill in Waynoka, Oklahoma;
- Clean Harbors Deer Trail, LLC, (aka Highway 36 Landfill), Adams County, Colorado;
- Arlington Hazardous Waste Facility, 17629 Cedar Springs Lane, Arlington, OR 97812; and,
- Kettleman Hills Hazardous Waste Facility, 35251 Old Skyline Road, Kettleman City, CA.

Hazardous waste shipped from the site will be packaged in accordance with DOT regulations. Drums will be labeled as “Hazardous Waste.” Hazardous waste manifests will note the EPA identification number of the generator, all transporters of the waste, and the ultimate disposal facility.

10.0 LIMITATIONS

10.1 Standard of Care

Terracon’s services 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 period. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of the report. These services were performed in accordance with the scope of work agreed to by CA Industrial Holdings, LLC.

10.2 Additional Scope Limitations

Findings, conclusions and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; 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, nondetectable or not present during these services, and Terracon cannot represent that the property contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during the investigation. Subsurface conditions may vary from those encountered at specific borings or wells or during other surveys, tests, assessments, investigations or exploratory services; the data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

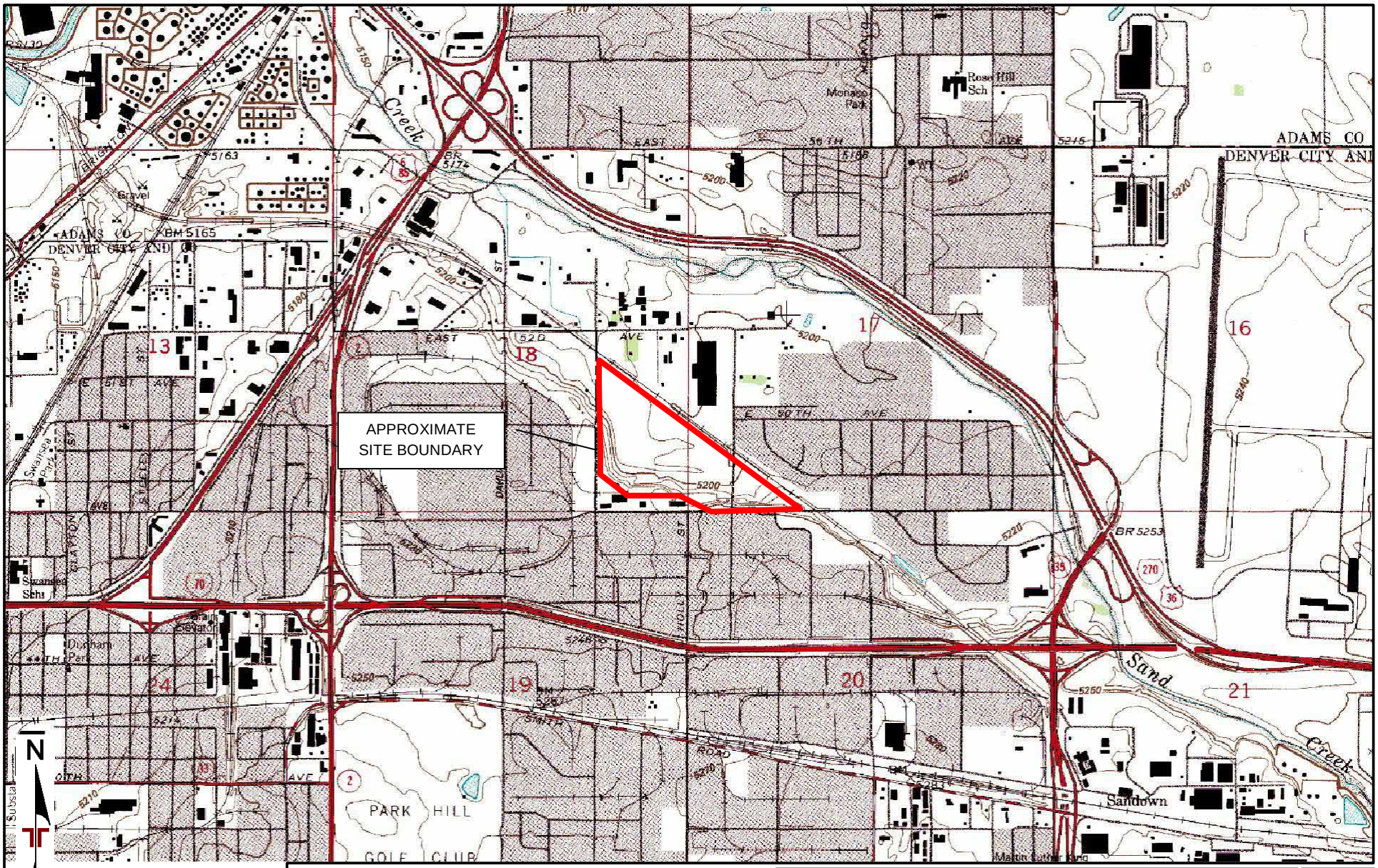
Terracon will not sign waste disposal manifests as the generator. Terracon can sign as agent for the generator if authorized in writing. It is assumed that CA Industrial Holdings, LLC, or CAI's authorized representative will sign waste disposal manifests as the generator.

Terracon understands that the geotechnical evaluation and this associated MMP will be subject to approval from various entities, likely including the client, EPA, CDPHE, BNSF Railway Company, and BFI Waste Systems of North America, LLC. As such, we anticipated having to amend our geotechnical scope of services and this MMP as the project progresses.

10.3 Reliance

This MMP has been prepared for the exclusive use of CA Industrial Holdings, LLC. Any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the property) is prohibited without the express written authorization of CA Industrial Holdings, LLC and Terracon. Any unauthorized distribution or reuse is at the client's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions and limitations stated in Terracon's Consulting Services Agreement and associated reports.

EXHIBITS



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY QUADRANGLES INCLUDE: COMMERCE CITY, CO (1/1/1994).

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

Project Manager:	BMW
Drawn by:	BMW
Checked by:	KRS
Approved by:	KRS

Project No.	25207313
Scale:	1"=2,000'
File Name:	EXHIBITS
Date:	8/3/2020

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

TOPOGRAPHIC MAP

Proposed Sand Creek Industrial Complex

48th Avenue and Ivy Street
Commerce City, CO

Exhibit 1

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

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

Project Manager:	bmw
Drawn by:	bmw
Checked by:	krs
Approved by:	krs

Project No.	25207313
Scale:	AS SHOWN
File Name:	SC X2
Date:	8/11/2020

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

SITE DIAGRAM

Proposed Sand Creek Industrial Complex

48TH Avenue and Ivy Street
Commerce City, CO

Exhibit 2

EXHIBIT 3:
PROPOSED DEVELOPMENT LAYOUT BY KIMLEY-HORN WITH PRELIMINARY GEOTECHNICAL SOIL BORING LOCATIONS

BULDING NO.	BUILDING SF	CLEAR HEIGHT	PARKING
BUILDING 1	162,000	32'	192
BUILDING 2 NORTH	217,080	36'	140
BUILDING 2 SOUTH	63,040	28'	84
BUILDING 3	244,506	36'	164
BUILDING 4	93,600	28'	208
BUILDING 5	60,480	28'	70

PROPOSED GEOTECHNICAL BORING
(APPROXIMATE LOCATION)

Note: The actual number of soil borings will be based upon the final geotechnical Work Plan

PARKING TOTALS

TRAILER PARKING: 103

AUTO PARKING: 858

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

TLC SITE PLAN

02/01/2021

Kimley»Horn

4582 SOUTH ULSTER STREET, SUITE 1500, DENVER, 80237
PHONE: 303-228-2300

EXHIBIT 4:
DESIGN LEVEL GEOTECHNICAL SOIL BORING LOCATIONS

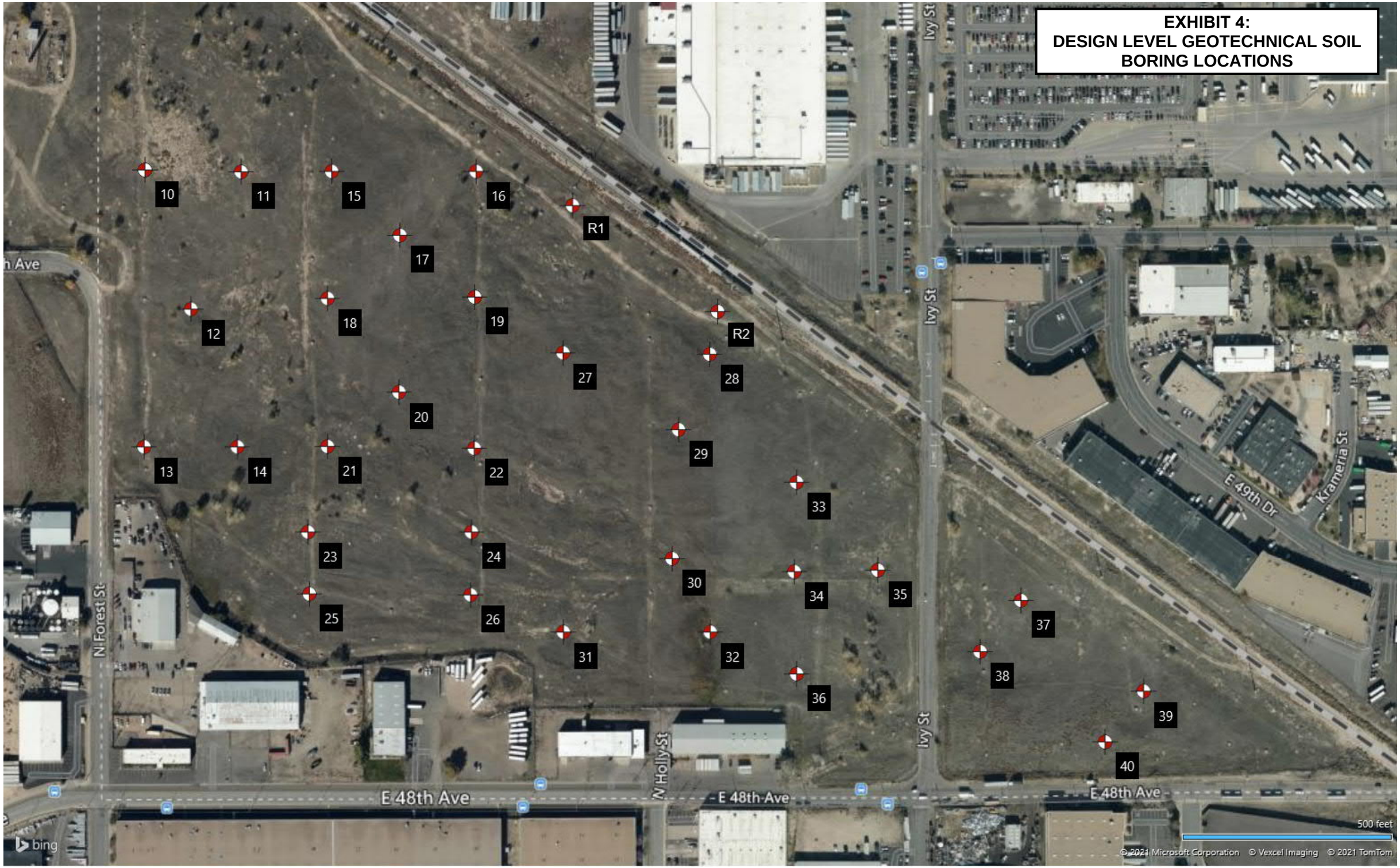


EXHIBIT 5:
SITE LAYOUT WITH PROPOSED LMG INJECTION PILOT TEST AREAS

BULDING NO.	BUILDING SF	CLEAR HEIGHT	PARKING
BUILDING 1	162,000	32'	192
BUILDING 2 NORTH	217,080	36'	140
BUILDING 2 SOUTH	63,040	28'	84
BUILDING 3	244,506	36'	164
BUILDING 4	93,600	28'	208
BUILDING 5	60,480	28'	70

PARKING TOTALS

TRAILER PARKING: 103

AUTO PARKING: 858

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

TLC SITE PLAN

02/01/2021

Bldg 1 Test Area
5 locations within 50'x50' area

Bldg 2 Test Area
3 locations within 50'x50' area

Bldg 4 Test Area
5 locations within 50'x50' area

Bldg 5 Test Area
3 locations within 50'x50' area

BUILDING 1
162,000 SF

BUILDING 2 NORTH
243,000 SF

BUILDING 2 SOUTH
63,040 SF

BUILDING 3
244,506 SF

BUILDING 4
93,600 SF

BUILDING 5
60,480 SF

TRAILER PARKING AREA

ACCESS FROM FOREST AVE

ACCESS FROM IVY STREET

FOREST STREET

IVY STREET

NEIGHBORING BUILDING

E. 48TH AVE.

APPENDIX A

Keller LMG Injection Proposal

Triangle Logistics

Grouting Test Program Proposal

May 6, 2021

KELLER

FEBRUARY 26, 2021

LC DEVELOPMENT CONSULTANTS LLC
1807 S. WASHINGTON, SUITE 327
NAPERVILLE, IL 60565

ATTENTION: **LYNX CHAN**

REGARDING: **TRIANGLE LOGISTICS CENTER**
GROUTING TEST PROGRAM
FOREST STREET AND EAST 50TH AVE
COMMERCE CITY, CO

Mr. Chan,

As per your request, Keller North America (Keller) is pleased to provide the following proposal for a grouting test program for the new structures proposed at the project site.

This proposal is based on the following:

- Discussions with project team.
- Preliminary borings, photos, grading plans and layout provided.
- Successful design and construction on several adjacent landfill deposits within 10 miles of the site.
- Considerations in Keller's budget proposal dated 2/25/21.

Introduction

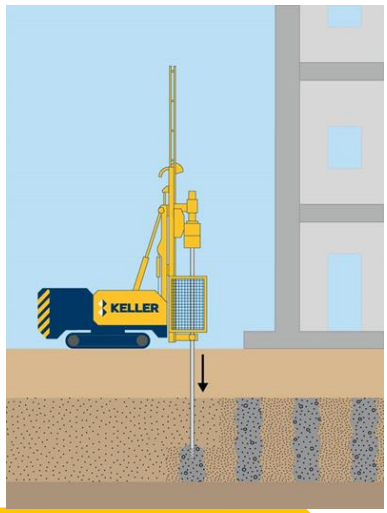
Keller proposes to perform a grouting test program to better identify ground conditions on the site. This additional information will provide grouting results which can be analyzed, tested and used to verify assumptions in an updated cost proposal. The grouting test program will explore encountered required injection pressures, grout volumes, drilling conditions, hole spacings, depth, ground and landfill reaction. Keller is available to discuss data collection that may benefit the geotechnical engineer of record. Other members of the project team will be provided an opportunity to observe the grouting process and general site requirements.

The below test program may be expanded or modified as deemed appropriate to control cost, schedules or other concerns.

Grout Test Program

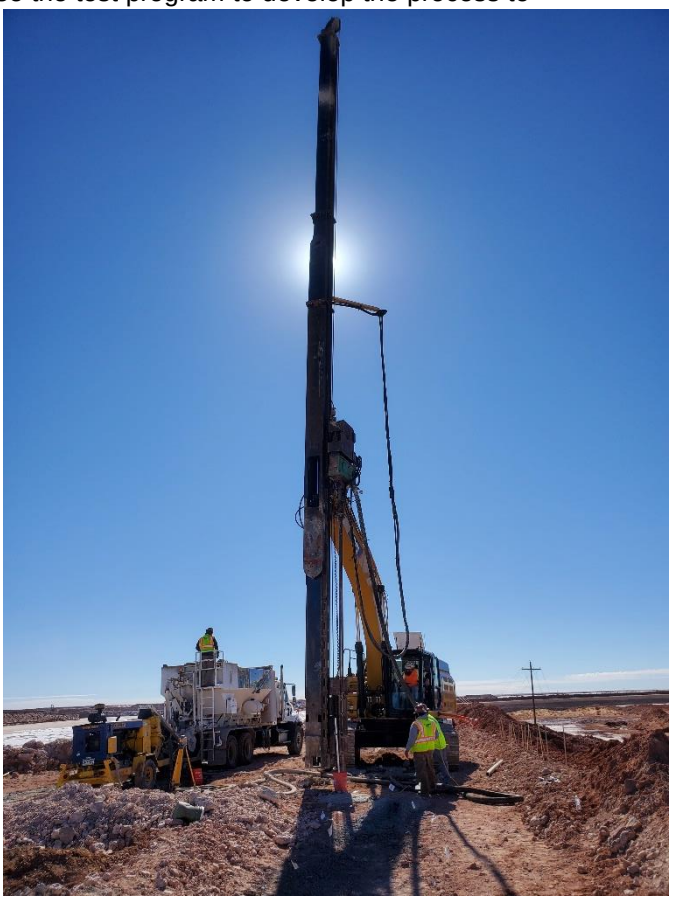
Keller will provide crew, materials, and labor necessary for the grouting test program. Initially, a nominal 3" casing will be drilled or driven to termination depth; grout will be pumped through the casing in the target zone using the below cutoff criteria. Remaining elevations will be pumped and pulled. Grout will be pumped at each stage until one of the following refusal criteria is met:

A grout pump gauge pressure of 150-300 psi
A grout volume of 5-9+ CF
Ground heave or other undesired movement.



The procedure is repeated at each grouting location. Hole layout and cutoff criteria may be modified in the field based on conditions encountered.

Keller understands the concern with spoils and will use the test program to develop the process to understand and minimize spoils generation during the work.



It should be noted that the grouting that is completed during the test program will go towards the treatment of the whole pad. In other words, the money spend here would not need to be re-spent if the team continues with this operation.

Layout
In general Keller recommends performing grouting in the following areas.

In base price
1 - Building 4 North (5 locations)
2 - Building 1 North (5 locations)

The following locations may be added and performed at the day rate costs provided.
Opt. A. - Building 2 (1-3 locations) (~0.5 days)
Opt. B. - Building 3 (1-3 locations) (~0.5 days)
Opt. C. - Building 5 (1-3 locations) (~0.5 days)

Keller will use the available information to place test locations in production grouting areas as possible. This should allow for some of the test program costs to go towards actual production ground improvement for the project.

Exclusions:
The following items are to be provided by Others, if required:

- Access to a minimum of 50'x50' at each test location. Relatively flat. If earthwork/SWPP cannot be provided by others and is required, then additional compensation may be requested. Any required post grouting remediation (grading, SWPP, seeding, etc.) by Others.
- Permits other than for our own transportation.
- Material testing or any other testing. Keller can provide samples for testing by Others. Keller will work with Terracon to develop post-grouting test methods and analysis to be conducted by Terracon.
- Private utility locates or potholing. Keller requires notification of any known utilities.
- Removal of drill and grouting spoils. Disposal and removal of contaminated materials. Keller will provide an Eco pan for washout and will leave any additional spoils onsite.
- Survey to identify the building pads. Keller can provide these services for cost + $1,000.

All existing utility locating and protection to be provided by Others. Any utility within 15' of the work area should be located and potholed. Potholing and visual confirmation of actual depth is required at all utility locations. Actual utility location and access considerations may limit the effectiveness of proposed grouting program. Test locations may be moved to avoid known utility or monitoring locations.

Schedule
We expect the grouting program to take approximately 1 week depending on final scope and encountered conditions. This schedule includes the utilization of one crew. Keller may elect to work Saturdays at its own discretion. We are available to mobilize at an agreed upon time.

Schedule of Prices

Keller North America, Inc. (Keller) proposes to perform the work described in the accompanying letter for the prices listed below. It is understood that the quantities below are estimated, and that final payment will be based on the actual quantities.

Item Description	Quantity	Unit	Unit Price	Extend Price
Test Program 2 Areas (Bldg 4 & 1)	1	LS	$98,000	$98,000.00
Additional Day (if desired)		Shift	$12,500.00	
Standby (Equipment Only)		Shift	$7,000.00	
			Total	**$98,000.00**

Closing
We trust this proposal is of interest to you and we look forward to being of service. If we can be of any assistance in clarifying any points in this proposal, please contact us at 303-469-1136.

Respectfully,

Keller North America, Inc

Joe Amend
Project Manager

Phillip Gallet, PE
Senior Engineer – Business Development Manager

TERMS AND CONDITIONS

The following facilities and services are to be provided to KELLER by others free of all costs to KELLER:

Site Access: Preparation and maintenance of clear, well drained, uninterrupted access ways and working platforms suitable for KELLER equipment moving under its own power. Access includes adequate ramps at suitable levels and should be available at the time and to the extent necessary to suit KELLER's operations. All earth-support structures shall be designed, analyzed, and/or modified accordingly to support KELLER's equipment and operations.

Sequence: Work is to be made available in a sequence that will enable KELLER to work efficiently and systematically without restriction.

COVID-19: Notwithstanding any provision(s) of this Subcontract, if Subcontractor's work is delayed, disrupted, suspended, or otherwise impacted as a direct or indirect result of COVID-19 (coronavirus), including, but not limited to, by (1) disruptions to material and/or equipment supply; (2) illness of Subcontractor's workforce and/or unavailability of labor; (3) government quarantines, closures, or other mandates, restrictions, and/or directives; (4) Owner or Contractor restrictions and/or directives; and/or (5) fulfillment of Subcontractor's contractual or legal health and safety obligations associated with COVID-19; then, Subcontractor shall be entitled to an equitable adjustment to the Subcontract schedule and duration to account for such delays, disruptions, suspensions, and impacts. To the extent the causes identified herein result in an increase to the price of labor, materials, or equipment used in the performance of the Subcontract, Subcontractor shall be entitled to an equitable adjustment to the Subcontract price for such increases, provided Subcontractor presents documentation of such increases (including the original prices) and evidence of such increases (including the original prices) and evidence of Subcontractor's reasonable efforts to find alternative sources of material or equipment supply and/or labor at the original/un-impacted prices.

Progression of the Work: KELLER 's proposal is based upon carrying out the work in an unobstructed manner during regular working hours, Monday through Saturday, in a single uninterrupted visit to the site. KELLER reserves the right to work overtime or weekends at KELLER's own discretion without incurring charges for inspection, site overhead or other consequential charges. In the event that KELLER 's work is interrupted for any reason beyond our control KELLER shall be compensated at the rate identified in the schedule of values for standby of the crew and equipment

Site Preparation and Maintenance: Removal of all surface or subsurface topsoil, brush, organic material and other unacceptable material in accordance with the requirements of the contract documents.

The design and installation of all sediment barriers, silt fence, erosion control and all other appurtenances required by the Storm Water Pollution Prevention Plan developed by Others.

The design and installation of any necessary railings, fences or other protective measures as required by local, state and federal statutes so that workers and the public are protected from falls or accidental entrance into the work site.

Water Control: All work necessary to control and maintain the site and excavation free of ground or surface water problems as they relate to KELLER 's operations.

Prevent surface water and subsurface or groundwater from accumulating in and on project site and surrounding area. Maintain the water table at least 10 feet below the grade of the work area. Provide local disposal of wastewater created by KELLER 's operations.

Site Work: The work under this proposal does not include any excavation, grading or sealing work required on the

site to establish a working platform or to restore the site to the original or finished grade. All such work is to be furnished by others in a timely manner, so as not to impede the progress of the work or cause damage to the finished work.

Excavation and Spoil Removal: All necessary excavation and disposal, including removal of solid and liquid waste materials resulting from the work.

Protection of Adjacent Structures: Any necessary additional protection of existing structures, utilities, or roadways which may affect or impede KELLER's work.

Traffic Control: All pedestrian and vehicular traffic control including signs and barricades, if and when required.

Utilities: KELLER will utilize the local Utility Notification System in order to locate utilities on the site. Location, potholing, removal or relocation of any utilities not located by this service is the responsibility of the Owner, Developer and/or Contractor. KELLER will not accept any responsibility for damage to utilities not located by the one call service. Furthermore, any utilities located by the one call system that are in conflict with KELLER's activities may need to be potholed, removed or relocated at the expense of the Owner and or Contractor if KELLER's work cannot be adjusted. Any costs associated with the adjustment of KELLER's work due to utility conflicts will be the responsibility of the Owner and or Contractor.

KELLER can not and will not be responsible for any damage to any utilities at the site as a result of KELLER's work. The Owner or Others are responsible for locating private utilities at the site prior to KELLER's mobilization to the site and must complete this work to suit KELLER's mobilization schedule. If this work is not done prior to KELLER's mobilization based on its schedule, KELLER will not proceed with mobilization and work. Furthermore, it is possible that utilities may be encountered by KELLER's operations, and the successive grouting operation may cause damage and grouting-up of the encountered utility. This may cause damage to mechanical machinery, utilities, conduits or other facilities. KELLER is not responsible for any such resulting damage or grout intrusion as a result of this remedial work. The Owner understands and accepts that damage to utilities may occur as a result of this work, and accepts all responsibility, including remedial costs for damage to all such utilities which may be damaged.

Layout: Continuous and complete survey and field layout of all necessary lines and grades from which KELLER 's work can be established. Any post construction survey of the work shall also be performed.

Engineering: All plans, specifications and designs, necessary for the work.

Permits and Easements: All site permits and easements required to legally perform the work.

Water Supply: Adequate supply of clean fresh potable water supplied to within 100 feet of KELLER 's operations at the rate of 50 gpm at 50 psi.

Construction Waste Removal: Dumpster and/or other necessary containers for typical construction waste/debris/trash and removal and disposal of such materials. Containers to be provided within 200 yards of KELLER's operations.

Sanitary Facilities: On-site sanitary facilities for the use of KELLER employees.

Holiday and Sunday Work: Due to the unknown start date of this work, no holiday or Sunday pay or travel is included in KELLER's pricing under this proposal. KELLER shall be compensated for any and all costs including markup associated with holiday or Sunday pay or travel expenses form delays beyond KELLER's control or requests to work which extend project schedule over holiday or Sunday periods.

Winter Conditions: Due to the unknown start date of this work, provisions for winter conditions have not been included as part of this proposal. KELLER reserves the right to adjust the pricing and schedule durations presented here-in should any portion of the work be performed November thru March.

Security: Site security during nights and weekends.

Site Yard: An area shall be provided on-site, adjacent to the work, for KELLER's equipment, storage yard, workshop, and site office(s).

Union Manning: Labor to comply with union requirements on KELLER operations other than those specifically discussed in the proposal.

Prevailing Wage Rates: Pricing as presented here-in does not include prevailing wage rates, Davis-Bacon wages, certified payroll or other required wages other than open shop labor rates typically paid by KELLER on Private Commercial work.

Labor Affiliations: This proposal is made with the understanding that KELLER will employ open shop labor. In the event that union labor must be used the client will pay for any cost differential.

Vibration Liability: KELLER cannot accept any liability for disturbance to existing structures and their inhabitants on or near the site. KELLER requires that the Owner/General Contractor indemnify KELLER against any and all claims for such disturbances and also take precautions as necessary to avoid any such claims. This may include vibration monitoring, excavating trenches around the affected area, etc.

Hazardous Material: In the event that KELLER encounters any hazardous material on the site that has not been rendered harmless, KELLER shall immediately stop work in the area affected and report the condition in writing to the Owner and Engineer. To the fullest extent permitted by law, the Owner and Contractor shall indemnify and hold harmless KELLER, their agents, consultants, and employees from and against all claims, damages, losses and expenses, including but not limited to attorney fees arising out of or resulting from performance of the work in the affected area.

Third Party Billing, Document, Payment and Invoice Management: All costs for the utilization by the Owner and/or Contractor of a third-party online or electronic invoice and/or payment management service or system will be borne by the Owner or Contractor and will be added to KELLER's invoice for the work. KELLER will not be responsible for the costs associated with the use of these systems.

The following additional terms and conditions will apply to the proposed work:

Liquidated Damages: The [Owner or Contractor] shall not be entitled to any liquidated damage, delay damage or other time related penalties arising from the work.

Bonds: The cost of a bond premium is not included in the contract price. If desired by and paid by the [Owner or Contractor], KELLER will furnish a Payment and Performance Bond.

Confidentiality: All specifications, drawings, price and technical data submitted by KELLER are to be treated as confidential and shall not be used for any purpose other than the evaluation of this bid, nor shall such information be disclosed to any third party for any purposes without the express written consent of KELLER. Such information shall remain KELLER 's property and be returned to KELLER upon demand.

Buy American: KELLER's pricing as presented here-in does not include material solely manufactured in the United States. If the Buy America provision applies on this project, additional costs will apply.

Period of Acceptance: This Proposal is offered for acceptance for a period of 30 days.

Exclusions: Any items of work not specifically included in this proposal shall not be the responsibility of KELLER.

GENERAL TERMS AND CONDITIONS

Payment Terms: Progress payments will be submitted monthly and shall be payable within 30 days of the invoice date.

All other amounts due, including retention (if any), will be paid in full within 45 days of substantial completion of KELLER's work, regardless of the anticipated project completion date.

An interest charge of 1-1/2% percent per month will be added to invoice amounts not paid within 30 days from date of invoice. All costs of collection, including attorneys' fees and court costs, will be added to unpaid invoice amount.

KELLER shall be paid in full, including retainage no later than 45 days after the substantial completion of KELLER's work.

Changed Conditions: Notwithstanding all clauses of this contract, if KELLER, during its work, encounters 1) subsurface conditions or latent physical conditions which differ from those indicated in this Agreement, or 2) unknown physical conditions of an unusual nature, differing from those ordinarily encountered, then KELLER shall be entitled to an equitable price and schedule adjustment to compensate it for such changed condition.

Full Compensation: It is understood that KELLER will receive full compensation for its work, as set forth in the schedule of prices above for all work performed to the satisfaction of the Owner and/or Contractor regardless of any adjustments, or audits made by the Owner and/or Contractor due to the "Change Order" or "Claim" nature of the work.

Insurance: KELLER will provide the following insurances within limits as shown.

Comprehensive General Liability:	$2,000,000.00
(Combined Single Limit, Bodily Injury and Property Damage)	
Automobile Liability:	$1,000,000.00
(Combined Single Limit, Bodily Injury and Property Damage)	
Workman's Compensation:	$1,000,000.00

Force Majeure: KELLER cannot accept any liability for default or delay in the completion of the work when caused by strike, riot, war, or Act of God or other similar circumstances beyond KELLER control.

Limitation of liability. All private utilities (including utilities left in place) and other services shall be located, exposed, and shown to our on-site representative by Others prior to commencement of work. KELLER will not be liable for any damages to any utilities or services that are not located prior to commencement of the work. Further, while the Parties recognize that some landscaping may become damaged during the process, KELLER agrees to take reasonable steps and exercise caution so as to avoid causing any significant damage to the landscaping. It is further recognized that in the process of releveling, there may be some damage to the structure that occurs. Except and unless KELLER is solely negligent in its operations, KELLER shall not be liable for any structural damage consequently caused by their work.

Liability: No liability can be accepted by KELLER, nor shall KELLER accept as in any way responsibility for defects of any kind whatsoever arising from a cause which is outside KELLER's immediate control or knowledge, or for any

fault in the junction between KELLER's work and subsequent work carried out by others.

Indemnity: Subject to the terms of the Liability Clause above, and to the correct soil conditions having been provided to us prior to our work, KELLER shall **insure**, indemnify and hold harmless the Owner and their employees from and against all claims, damages, losses, and expenses, including attorney's fees, but only to the extent of the negligence of KELLER, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to the injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom, and only to the extent such claim is covered under the General Liability Policy of KELLER.

Standard Construction Contracts: As an alternate to accepting KELLER's proposal as the contract document, KELLER considers the "Standard Form Construction Contract" as prepared jointly by AGC, ASA and the ASC, 1994 Edition to be balanced and fair to all parties. Such contract, with no changes to the standard text thereof, along with this proposal and the specific documents herein, could form the contract for the work herein proposed. Any other contract form will require our review. Where incorporated into a contract, this proposal shall supercede all conflicting terms of such a contract.

Accepted By: _____

Company: _____

Name (print): _____

Title: _____

Date: _____

Standing Together (at a social distance)

Care and concern for people is always the top priority

The evolving reality of COVID-19 is one we are facing virtually together (and physically at a social distance). Our company has a deep belief in being the best we can for people – you, our employees, and everyone we work around. Throughout this challenging time, we have been working to create responsible actions that respect our communities, protect the safety of our employees, and maintain operations to meet the needs of our clients.

We are continuing to follow the guidance issued by the CDC and our local authorities and adapting as necessary for the well-being of our staff and our communities. We want to let you know measures we have taken and what else you can expect from us as we partner in this together:

• Creation of specific COVID-19 pre-project planning procedures for our field and office employees to mitigate exposure.
• Implementation of a daily cleaning protocol for vehicles, offices, equipment, and laboratories as recommended by our industrial hygiene experts.
• Prohibition of all business travel outside of the U.S. Employees who travel internationally on personal time are required to practice distancing or self-quarantine.
• Limiting U.S. air travel to only meet the staffing needs of our clients' projects.
• Postponing or cancelling large-scale meetings including conferences and training workshops, and all internal meetings requiring air travel.
• Holding all other meetings virtually, and, if an in-person meeting is necessary, limiting attendance to no more than ten. We have also enacted safe meeting practices for our personnel for these instances.
• Reducing exposure by utilizing technology to meet virtually and enabling our employees to work remotely for our clients whenever possible.

In these uncertain times, we are leaning into innovation and challenging ourselves to work differently. As employee-owners, camaraderie and caring are ingrained in who we are and how we work together to support your project needs. We appreciate the confidence you have shown in us, and we are grateful for your business. We expect the situation will continue to require close collaboration in the coming weeks, and we look forward to getting back to normal operations.

As new information becomes available, or if we experience any changes that impact our ability to perform our work, we will keep you informed. Our local office teams will be reaching out to clients to discuss their project status to ensure we are responsive and discuss any changing requirements. In the meantime, we are a phone call, text, or email away should there be anything we can do to help you during this time.

Gayle Packer
President and CEO

Terracon SAFETY Share

Ref #: 004-2020 **Date:** March 5, 2020 (rev7/06/20) **Title:** COVID-19 Update

Terracon is diligently monitoring developments related to the coronavirus (COVID-19), declared by the World Health Organization (WHO) and the Centers for Disease Control (CDC) as a public health emergency, and its potential impact on our company. As the situation evolves, please know the health and safety of our employees and their families will continue to be our top priority.

Because the situation changes daily, Terracon Safety and Human Resources, along with industrial hygiene experts from Operations have created a dedicated task force to monitor the latest information, prevention protocols, and affected locations, via the WHO and CDC, so we are prepared to take immediate actions as needed. We will keep office managers and employees updated on those changes through our newsletters, safety shares and a COVID-19 resource page on Terranet.

What Can I Do to Reduce My Risk to COVID-19?

- ✓ Familiarize yourself with COVID-19 symptoms and guidance for prevention and treatment, as provided by the CDC or WHO.
- ✓ ***Stay home*** if you ***or your family members*** are sick. Don't spread the germs! If you exhibit even mild symptoms during that time, such as a fever, cough, or shortness of breath, avoid contact with others, call your healthcare provider immediately, and inform your supervisor.
- ✓ Extra precautions should be taken if you are an at-risk group – if you are pregnant, over 60 years of age, or have underlying health conditions that weaken your immune system.
- ✓ Wash your hands often with soap and water for at least 20 seconds, especially after going to the bathroom, before eating and after blowing your nose, coughing, or sneezing. Use hand sanitizer if soap and water is not available.
- ✓ Avoid close contact with people – especially those who are sick. Fist bumps and elbow bumps are replacing handshakes and hugs! During meetings, position chairs about 6 feet apart to reduce the potential spread of the virus.
- ✓ Don't share PPE (especially respirators) and clean your PPE often. Think about those shared safety glasses that hang outside our lab entrances. Get rid of shared PPE and clean it after every use. Safety glasses can be run through the dishwasher, just avoid the dry cycle.
- ✓ CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies) especially in areas of significant community-based transmission as an additional, voluntary public health measure. The cloth face coverings recommended are not surgical masks or N-95 respirators.
- ✓ Practice good hygiene. Cover your mouth when you cough or sneeze. Immediately dispose of tissues. If you don't have a tissue, cough or sneeze into your upper sleeve, not your hands. Avoid touching your eyes, nose or mouth with unwashed hands.
- ✓ Clean and disinfect frequently touched objects, vehicle interiors and work surfaces using a regular household cleaning spray or wipe.

For more information, please contact Terracon Safety
safety@terracon.com

- ✓ If your business or personal travel will be taking you to an area of the world impacted by COVID-19, please let your supervisor know immediately.

Thank you for your commitment to ***IIF*** and being a proactive part of this effort to support the health and safety of you and your families. If you have questions related to COVID-19 or its possible impact on your office operations, please contact your HR Business Partner or Operating Group Safety Professional.

Terracon has created a COVID-19 resource page on Terranet and added documents to the Safety Library mobile app with prevention tips and other up-to-date information. The following resources are available.

- Prevention, Treatment of Coronavirus Disease (COVID-19) CDC
- What You Need to Know (COVID-19) CDC
- What You Need to Know (COVID-19) CDC Español
- Stop the Spread of Germs POSTER (COVID-19) CDC
- Stop the Spread of Germs POSTER (COVID-19) CDC Español
- Symptoms of Coronavirus Disease (COVID-19) CDC
- Symptoms of Coronavirus Disease POSTER (COVID-19) CDC
- Symptoms of Coronavirus Disease POSTER (COVID-19) CDC Español
- What to do if you are Sick (COVID-19) CDC
- What to do if you are Sick (COVID-19) CDC Español
- Cleaning / Decontamination Protocols
- EPA Approved Disinfectant List sars-cov-2
- Pre-Task Planning Guides
- Tips for Remote Work / Telecommuting
- Family Resources

COVID-19 Pre-Task Planning General Protocols

- **Understand the Symptoms, Prevention and Treatment** - Familiarize yourself with COVID-19 symptoms and guidance for prevention and treatment, as provided by the CDC or WHO.
- **Wash Your Hands Frequently** – Use soap and water for at least 20 seconds. When soap and water are unavailable, use an alcohol-based hand sanitizer with at least 60% alcohol.
- ***Stay home* if you or your family members are sick** - If you ***or your family members*** are sick or experiencing symptoms you should stay home. Not doing so increases the risk of spreading this as well as other illnesses. If you exhibit even mild symptoms avoid contact with others, call your healthcare provider immediately, and inform your supervisor.
  - ✓ Are you experiencing cough, congestion, shortness of breath or difficulty breathing? If yes, please do not come to work and notify your supervisor.
  - ✓ Are you experiencing any two of the following fever, chills, fatigue, muscle pain, headache, sore throat, nausea, vomiting, diarrhea, loss of taste or smell? If yes, please do not come to work and notify your supervisor.
  - ✓ Did you take your temperature and is it less than 100.4º F? If your temperature is above 100.4º F, please do not come to work and notify your supervisor.

  If you have trouble breathing, persistent pain or pressure in the chest, new confusion (unresponsive / incoherence), bluish lips or face, inability to stay awake - get ***medical attention immediately***
- **Take extra precautions if you are an at-risk group** – If you are pregnant, over 60 years of age, or have underlying health conditions that weaken your immune system (heart disease, diabetes) you may be more at risk for serious illness if you contract COVID-19.
- **Use social distancing when around people** - The virus is spread primarily from person to person by those who are in close contact (roughly 6 feet or less) through respiratory droplets produced through coughing or sneezing that may be airborne or on an individual's skin. *Social distancing is one of the most important steps you can take to prevent the disease.* Avoid close contact with people – especially those who are sick. Elbow bumps and head nods should replace handshakes and hugs! During meetings, position chairs further apart (~ 6 feet) to reduce the potential spread of the virus.
- **Clean your work area regularly** - the COVID-19 virus can also be contracted by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes. Cleaning of work surfaces and tools is a required proactive step.

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COVID-19 Pre-Task Planning General Protocols

- **Practice good hygiene** - cover your mouth when you cough or sneeze. Immediately dispose of tissues. If you don't have a tissue, cough or sneeze into your upper sleeve, not your hands.
- **Avoid touching your face - eyes, nose or mouth** especially with unwashed hands or after contact with surfaces or other workers.
- **Use of Masks** - Cloth face coverings may help prevent people who have COVID-19 from spreading the virus to others. CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies) especially in areas of significant community-based transmission. The use of cloth face coverings do not replace and must be used along with other preventive measures, including social distancing, frequent handwashing, and cleaning and disinfecting frequently touched surfaces. The cloth face coverings recommended are not surgical masks or N-95 respirators. Terracon employees should wear cloth face coverings when social distancing measures are difficult to maintain, per PTP09 Cover Your Mouth or local requirements. If heat stress becomes a concern, immediately remove face coverings and stop work to rest.
- **Travel**
  - Reference travel guidelines on the Terracon COVID-19 resource page regarding business travel.
  - If you have personal travel planned, please be considerate of those in your office and report travel to your supervisor.
  - Consult the CDC's Considerations for Travelers page, review and follow the CDC guidance regarding self-isolation or other measures to take upon returning from travel.

COVID-19 Pre-Task Planning Project Sites

It is the responsibility of all managers and supervisors in an office to understand, communicate, implement, and assist our employees in applying these precautionary steps as well as the General Guidelines for COVID-19 Pre-Task Planning document.

- **Evaluate Job Sites and discuss with Client and or Contractor** – Project managers and assigned field staff should evaluate job sites where we will be working for potential exposure. Obtain as much information as you can from the client and/or contractor on current projects and for new projects.
  - Is the site high risk for exposure – like a hospital or medical facility?
  - Have there been reported COVID-19 cases or suspected cases at the site?
  - What precautions has our client and or contractor put in place for disease transmission prevention?
  - Ask our client or contractor to immediately notify us of suspected cases at the site.
  - What requirements does our client or contractor have for Terracon personnel that will be on-site?
  - Has anything changed that will impact our services, schedule, staffing, costs? If yes, we will need to discuss with our client immediately.
- **Agency shutdowns that impact our services** – Be aware that some agencies may be shut down and not respond to requests. Licensing, permitting, traffic control and 811 One Call Services, and local building officials may be impacted. In no way will Terracon deviate from our Core Rules and Practices or Lifesaving Absolutes. Practice Our Rules to Live By P3 and, *Step back for Safety. Stop Work if you feel it is unsafe to continue or if someone questions the safety of your behavior. Inform a supervisor of the situation and work together to identify and mitigate any hazard.*
  - If any of these closings will impact our services, schedule, staffing, or costs, we will need to discuss with our client immediately.
- **Review with our project team** - If an existing project, our Project Manager should have a conference call with our project personnel that will be on the project site and other critical staff (e.g. dispatcher, APR, etc.) to update any changes, requirements, and raise awareness. If for a new project, incorporate this into the kick-off meeting.
  - Share details that were provided by the client / contractor about the site.
  - Discuss tasks that may place any Terracon employees in close proximity (< 6 feet) to other workers and options for maintaining social distancing in these situations, for example:
    - Exchanging / signing paperwork, handling blueprints / specifications
    - Talking to property owners, equipment operators, other site personnel
    - Riding elevators
    - Working with our subcontractors
    - Checking in/out of the site
  - Review applicable pre-task planning documents with the team to ensure everyone knows the information and that our employees are properly equipped with supplies and information outlined in these documents.
- **Use of PPE** - Do not share PPE (especially respirators) and clean your PPE after use. Wear gloves as frequently as possible in the field and only remove when necessary. Treat gloved hands like bare hands – avoid touching your face with gloved hands.

- **<u>Use social distancing when around people</u>** - The virus is spread primarily from person to person by those who are in close contact (~ 6 feet or less) through respiratory droplets produced through coughing or sneezing that may be airborne or on an individual's skin. *Social distancing is one of the most important steps you can take to prevent the disease.* Avoid close contact with people – especially those who are sick. Elbow bumps and head nods should replace handshakes and hugs! During meetings, position chairs further apart (~ 6 feet) to reduce the potential spread of the virus.
  - Take lunches and breaks alone or at least 6 feet away from others.
  - Do not share food, cigarettes, lighters, etc.
  - When accessing stairwells or using elevators and lifts maintain as much clearance as possible. Ask to be alone in the lift.
  - Because construction sites are loud, it forces you to lean in to hear conversations or talk to others. ***You must maintain distance from others.*** Take conversations away from loud areas, talk on cell phones or text.
- **<u>Wash your hands and practice good personal hygiene</u>** – The best way to prevent the spread of COVID-19 is to practice good personal hygiene. This includes:
  - Equip employees with personal hygiene kits. Do not rely on the site to provide personal hygiene supplies. Water can be carried in portable containers and labeled "non-potable water". Label containers with contents if products are transferred into portable containers.
  - Options for personal hygiene supplies include hand sanitizer or wipes with at least 60% alcohol, soap / water. Please use professional supplies and ***do not attempt*** to make 'home made' cleaning supplies. ***Do not use*** cleaning supplies on your body if the product is not designed for use on the body.
  - Wash hands immediately after using portable restrooms on the project site. Frequently wash your hands with soap and water for at least 20 seconds, before eating and after blowing your nose, coughing, or sneezing. Use an alcohol-based hand sanitizer with at least 60% alcohol if soap and water is not available. Always wash hands that are visibly soiled.
  - Cover your mouth when you cough or sneeze. Immediately dispose of tissues. If you don't have a tissue, cough or sneeze into your upper sleeve, not your hands.
  - Avoid touching your eyes, nose or mouth especially with unwashed hands or after contact with surfaces or other workers.
  - Clean and disinfect tools and equipment. At a minimum, ***the user must clean tools after each use***. Avoid sharing tools, cell phones, tablets, PPE or any other item. If it is necessary to use shared tools, clean them before use.
    - Cleaning supplies include anti-bacterial / disinfectant spray liquid, cleaning wipes, aerosol spray, and soap/water. Please use professional supplies and ***do not attempt*** to make 'home made' cleaning supplies. Select cleaning supplies from the approved EPA list.
    - Use disposable paper towels for wipe downs not reusable rags. Dispose of paper towels in the trash immediately after use.
    - Wear safety glasses and chemical resistant gloves when cleaning equipment.
- **<u>Terracon Subcontractors</u>** – Review this Pre-Task Planning guidance document with all subcontractors used on our projects as they are required to follow all guidance outlined and project site requirements.

COVID-19 Pre-Task Planning Vehicles

It is the responsibility of all managers and supervisors in an office to understand, communicate, implement, and assist our employees in applying these precautionary steps as well as the General Guidelines for COVID-19 Pre-Task Planning.

- **Whenever possible assign vehicles to specific personnel and avoid pool vehicles and transport of passengers** – Assign vehicles to limit multiple users and the need for passengers. If passengers must be transported in the vehicle, drive with windows down and vents blowing air to maximize ventilation. If this is not possible due to weather conditions take multiple vehicles.
  - Passenger should wear cloth face coverings or KN95 masks during travel. Drivers must not wear cloth face coverings or masks when operating a vehicle.
- **Clean specific areas of the vehicle before and after use** - Drivers whether assigned a vehicle or using a pool vehicle should clean frequently touched objects like door and tailgate handles, steering wheel, knobs, and seat and remove all trash from the vehicle (do not leave paperwork, food wrappers, water bottles or any other waste in the vehicle cab or bed). At a minimum, ***the driver must clean the vehicle areas mentioned after each use***.
  - Options for cleaning supplies include wipes with at least 60% alcohol, disinfectant liquid or aerosol spray, or soap / water. Please use professional supplies and ***do not attempt*** to make 'home made' cleaning supplies. Select cleaning supplies from the approved EPA list.
  - Use disposable paper towels for wipe downs not reusable rags. Dispose of paper towels in the trash immediately after use.
  - Wear safety glasses and chemical resistant gloves when cleaning the vehicle.
  - Allow the vehicle cab to ventilate for five minutes after cleaning and before driving.
- **Wash your hands and practice good personal hygiene** – The best way to prevent the spread of COVID-19 is to practice good personal hygiene. This includes:
  - Wash your hands with soap and water for at least 20 seconds, before beginning your trip and immediately after arrival. Use an alcohol-based hand sanitizer with at least 60% alcohol if soap and water is not available.

COVID-19 Pre-Task Planning Guideline
Industrial Hygiene

This pre-task planning (PTP) guide is not all inclusive and was created to supplement other COVID-19 PTP recommendations. In order to conduct our industrial hygiene field work and meet our clients' needs, we recognize that industrial hygienists encounter unique circumstances that require careful consideration. Terracon industrial hygienists should not mobilize to a job site unless there is low risk for transmission of the coronavirus while traveling to, or at the site. Clients must provide documentation of their COVID-19 policies for decision making. The Terracon COVID-19 Action Plan should be provided to clients. If client does not have COVID-19 policies in place, the project should not be considered low risk. Some common circumstances that will require pre-task planning above and beyond the normal course of industrial hygiene field work include the following.

General

- Do not come to work if you are exhibiting symptoms, or if you think you may have been exposed to the coronavirus. Take your temperature each morning. If you have a temperature over 100°F, do not go to the office or a job site. If symptoms worsen, contact your health care provider for further instructions. Contact client if work will be postponed.
- *Social distancing is one of the most important steps you can take to prevent the disease.* Avoid close contact with people – especially those who are sick. Elbow bumps and head nods should replace handshakes. During meetings, position chairs farther apart (~ 6 feet) to reduce the potential spread of the virus
- Frequently wash your hands with soap and water for at least 20 seconds, especially after using the bathroom, before eating, after blowing your nose, and after coughing or sneezing. Use an alcohol-based hand sanitizer with at least 60% alcohol if soap and water is not available. Always wash hands that are visibly soiled.
- Wipe down interior of vehicle before and after each trip, especially high contact surfaces (steering wheel, arm rests, control buttons and dashboard surfaces).
- If possible, drive separately. If this is not possible, travel with vents open and fan on. Lower windows to improve airflow. Passenger should wear cloth face coverings or KN95 masks during travel. Driver should not wear a face covering.

Handling Paperwork / Equipment / Samples

- Wear nitrile gloves when handling sampling equipment and media. If the situation requires cut-resistant gloves, wear nitrile gloves over the cut-resistant gloves.
  - When handling rental equipment
  - When attaching pumps and media to and removing from workers and measuring pump air flow
  - When preparing samples for shipment
- Pre-clean work surfaces, such as desks and tables, with disinfecting wipes prior to using them for setting up sampling equipment and supplies. Place used wipes in a zip-closing bag after use for disposal.
- Change nitrile gloves as needed. Torn gloves should be replaced immediately.

- Only one person should handle calibration and sample data sheets, etc.
- Do not touch job site surfaces without gloves (work gloves or nitrile gloves).
- Used work gloves should be placed in a zip-closing bag after use for disposal.
- Do not touch your face with gloved or unwashed hands.
- Frequently wash hands/use hand sanitizer and clean commonly touched surfaces during the day.
- When delivering samples to the laboratory or for overnight shipping, wipe down sample jars/containers/bags with cleaning solution or disinfecting wipes prior to passing them to others or dropping them off for others to handle.
- Clean equipment before returning to storage or rental company/lab. Use approved disinfectant that is compatible with the equipment. Check with manufacturer before using disinfecting wipes/solutions on equipment with sensors (e.g., 4-gas meter).

Working in proximity to clients or other workers

- Practice social distancing (6-foot distance) when having safety meetings, inspections, passing samples or discussing issues.
- Limit attendance at meetings to no more than 10 people.
- Some activities (attaching and removing sampling equipment, discussing job tasks, etc.) will require industrial hygienists to come closer than 6 feet to client employees. Pre-task plan to limit close contact to the extent practicable. If Client employees are wearing face coverings, a non-respirator face covering should be worn. If Client employees are not wearing face coverings, wearing a respirator with P100, or N100 cartridges while in proximity to others can reduce your risk of being exposed to the coronavirus but will not protect others from exposure if you are infected. Client should be notified of planned respirator use during close contact situations.
- Practice good hygiene by turning away from co-workers or client employees and coughing or sneezing into your arm.
- Wear disposable outer garments (coveralls, lab coats, etc.) during field work. Carefully remove the outer garments using gloved hands at the end of field work and place in a zip-closing bag, or a bag that can be tied for disposal.
- Clean frequently touched, common surfaces. Use EPA-approved ready-to-use (RTU) disinfectants and wipes. Place in a zip-closing bag, or a bag that can be tied for disposal.
- Do not share water, coolers, food, tobacco products, etc. Use bottled water.

Use of Face Coverings

- Cloth face coverings may help prevent people who have COVID-19 from spreading the virus to others. Wear cloth face coverings when social distancing measures are difficult to maintain. Terracon employees should utilize cloth face coverings per PTP09 Cover Your Mouth or local regulations. If heat stress becomes a concern, immediately remove face coverings and stop work to rest.

COVID-19 Pre-Task Planning
Face Coverings

COVID-19 mainly spreads from person to person through respiratory droplets produced when an infected person coughs, sneezes, or talks. These droplets can be inhaled into the lungs or land in the mouths, noses or eyes of people who are nearby. Recent studies show that a significant portion of individuals with COVID-19 lack symptoms (are "asymptomatic") and that even those who eventually develop symptoms (are "pre-symptomatic") can transmit the virus to others *before* showing symptoms.

To reduce the spread of COVID-19, CDC recommends and many local agencies are requiring that people wear face coverings in public settings, especially when social distancing measures are difficult to maintain.

It is critical to emphasize that maintaining 6-feet social distancing, frequent hand washing and disinfecting frequently touched surfaces remains important to slowing the spread of the virus. Do not rely on a face covering as your only protection.

- **On Project Sites** – face coverings will be worn on all project sites where social distancing measures are difficult to maintain, where you may have unexpected contact with others or when required by client, local or state regulations.
  - If heat stress becomes a concern, remove face coverings and stop work to rest in a safe, socially distanced area.
- **In the Office or Lab** – face coverings are required at all times unless you are seated at your work station and you are 6 feet from other workers.
- **In a Vehicle** – Terracon encourages employees not to share vehicles. If vehicles must be shared, the passenger should wear a KN95 respirator. The driver should not wear a face covering while driving.
- **Practice good hygiene** - cover your mouth when you cough or sneeze. Immediately dispose of tissues. If you don't have a tissue, cough or sneeze into your upper sleeve, not your hands.
  - Face coverings are effective only when used in combination with frequent hand-cleaning with alcohol-based hand rub or soap and water. Before putting on a mask, clean hands with alcohol-based hand rub or soap and water. Avoid touching the mask while using it.
  - Never share face coverings between employees. Clean / launder cloth face coverings daily.
- **Cloth Face Coverings –** Cloth face coverings help prevent people who have COVID-19 from spreading the virus to others. CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain. Terracon requires that all employees follow the CDC recommendations or local or state guidelines and wear face coverings in public settings e.g., crowded projects sites.
  - Cloth face coverings are most effective when made of multi-layer, 100% cotton. If homemade face coverings are used, they must be multi-layer, 100% cotton. With the availability of face coverings, homemade coverings should only be used when no other option is available.

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- Cloth face coverings are effective only when used in combination with frequent hand-cleaning with alcohol-based hand rub or soap and water. Before putting on a covering, clean hands with alcohol-based hand rub or soap and water. Avoid touching the covering while using it.

- **Surgical Masks** – surgical masks are very effective as disposable face coverings and acceptable for all Terracon operations.
- **KN95 Respirators –** KN95 masks provide similar protection to N95 masks. Terracon asks that employees reserve N95 / KN95 respirators for project sites with higher risk for COVID-19 exposure like hospitals and medical facilities, crowded sites where social distancing measures are extremely difficult to maintain or when riding in vehicles (including air travel) with other passengers.
  - Respirators must not be shared between employees. Normally the respirators are considered single use however during the COVID-19 pandemic the CDC has established guidelines allowing the reuse of these respirators.
    - Do not reuse the respirator if it is damaged or heavily contaminated by aerosols or bodily fluids.
    - The CDC recommends no more than 5 respirator reuses or as recommended by the manufacturer.
- **Face Shields** – may be worn in conjunction with face coverings to provide additional protection against virus droplets.
  - Face shields must be used in conjunction with face coverings.
  - Face shields must be rated as Z.87 eye protection or be used in conjunction with safety glasses.
  - If hard hats are required, the face shield must fit the manufacturer's hard hat mount or, fit under and not interfere with the hard hat.
- **Resources**
  - US Surgeon General Dr. Jerome Adams shows how to make a face covering.
  - World Health Organization Dr. April Baller explains mask use.
  - Safety Professional Adam Maier's daughter shows you how to make a face mask using an oversize bandana.
  - Here are three templates for homemade face coverings.

    General Template BeeBee Healthcare Kaiser Healthcare
  - When making masks at home;
    - Do not use fabric liners (interfacing). It is too difficult to breathe through.
    - Use 100% cotton cloth. Do not use flannel – it gets too hot.
    - Use ties instead of elastic. Elastic hurts the ears after a while.
    - Some designs show sewn in cotton, vacuum bag material and furnace filters for extra filtration. **DO NOT** use any material that contains fiberglass or paper that will break down with moisture.

COVID-19 Pre-Task Planning Meetings (Internal, Client / Project, Conferences and Interviews)

As communities and companies begin returning to "normal" operations there will be opportunities and requests for Terracon employees to attend meetings. This protocol offers suggestions on how to safely host or attend different kinds of meetings. In addition to these protocols, we must comply with all federal, state, and local laws or regulations, particularly those relating to COVID and social distancing requirements.

- **General Guidance for All Meetings**
  - *Maintaining 6-feet social distancing remains the most effective way to slowing the spread of the virus!*
  - Do not use sign-in sheets that encourage passing paper and pens. Assign one person to take roll or use electronic attendance logs.
  - Cloth face coverings may help prevent people who have COVID-19 from spreading the virus to others. Terracon employees should wear cloth face coverings when social distancing measures are difficult to maintain, per PTP09 Cover Your Mouth or local requirements.
  - Avoid personal contact – no handshakes or fist bumps.
  - Whenever possible, meet outdoors.
- **In-Office Meetings**
  - Currently, in-office meetings (more than 4 total attendees) should not be conducted without Division Manager approval and only when it can be conducted in compliance with social distancing principles. Your office's Local Safety Coordinator shall be involved in the planning of any such meeting. Limit attendance to those only absolutely necessary and no more than can maintain social distancing requirements, or ten total attendees.
  - Meetings outside the office can be conducted using outdoor or warehouse space where social distancing can be maximized, and air circulation maintained. In warehouse space, consider using air movers to provide air flow across the meeting space toward the outside.
  - Consider setting up outdoor meeting areas at office locations. Use portable speakers and video displays. Be aware that weather conditions can change quickly. Pop-up canopies can become unstable in high winds. Ensure the space is safe and torn down when not in use.
- **Tailgate Safety Meetings**
  - Limit attendance to no more than can maintain social distancing requirements or ten total attendees. Hold multiple meetings if necessary.
  - Monitor wind direction and position attendees to take advantage of being upwind of any other employees.
  - Designate one person to handle required paperwork for sign-in. Others who need to sign the document can acknowledge understanding/agreement to the designated person and have them proxy sign if required.

- **Client or Project Meetings**
  - Limit attendance to those only absolutely necessary and ideally no more than four total attendees. Confirm with your client that they are comfortable with meeting face-to-face and a meeting does not violate their company's internal policies.
  - Hold the meeting outdoors to the extent possible. Consider outdoor jobsite locations, parks or setting up outdoor meeting areas at offices. Pre-task plan the meeting in advance by studying outdoor options in your community in advance. Choose the location based on seating options and overall effectiveness at social distancing. For client or project meetings that might require larger attendance, please refer to the In-Office Meetings section requirements for guidance, even if the meeting will not be held in our facility.
  - For restaurant meetings, only use outdoor tables that provide extra space. For a 2-person meeting request a 4-seat table, etc. Seat diagonally to maintain maximum distance.
  - Monitor wind direction and position attendees to take advantage of being upwind of others.
  - Wipe down tables and chairs with sanitizing wipes if available.
  - Have hand sanitizer and face coverings available to share. Wash hands immediately before and after the meeting.
  - Do not pass or accept paper. Email documents to the client in advance. Request needed documents be emailed to you in return.

Conference Attendance

- Conference attendance is highly discouraged and will only occur when it can be done safely and due to a *very compelling* business need. Requests for attendance must be approved by the Operating Group Manager and only if we are comfortable that the conference complies with established social distancing guidelines, as well as other Terracon Pre-Task Planning protocols associated with wearing of face coverings and other PPE. In addition, attendance should be limited in number of attendees and minimizing the time spent at the conference. Finally, conference attendees may be required to self-quarantine for 14 days post conference or to obtain a reliable, negative COVID test result before returning to work.

Appendix 7 – Materials Management Plan

Materials Management Plan for Geotechnical Services

Proposed Triangle Logistics Center
48th Avenue and Ivy Street
Commerce City, Adams County, Colorado

April 19, 2022
Terracon Project No. 25207313
Revision 2

Prepared for:
CA Industrial Holdings, LLC
Chicago, Illinois

Prepared by:
Terracon Consultants, Inc.
Wheat Ridge, Colorado

TABLE OF CONTENTS

EXHIBITS

APPENDICIES

MATERIALS MANAGEMENT PLAN FOR GEOTECHNICAL DRILLING
TRIANGLE LOGISTICS CENTER
48TH AVENUE AND IVY STREET
COMMERCE CITY, ADAMS COUNTY, COLORADO

April 19, 2022
Terracon Project No. 25207313
Revision 2

1.0 INTRODUCTION

The site consists of approximately 65.5 acres corresponding to Adams County Assessor parcels 0182317300008 and 0182317300029. The approximately triangular shaped area is bounded by 48th Avenue to the south and a Union Pacific railroad right-of-way to the north. The western edge of the site is defined by a line extending along Forest street from the southwest corner of the site north to the intersection with the railroad ROW. Ivy Street separates the two parcels and transects the site south to north. The location of the site is depicted on Exhibit 1, which was reproduced from a portion of the USGS 7.5-minute series topographic map. The site and adjoining properties are depicted on the Site Diagram, which is included as Exhibit 2.

The site was historically used as a municipal landfill and site grounds consist of an engineered soil cover over refuse. An active landfill gas collection system is present at the site. The collection points are reported to discharge to a flare system located on the western adjoining property. Additional information is presented below.

This Materials Management Plan (MMP) has been prepared to facilitate geotechnical-related services (i.e., drilling, grout injection, and test trenches) activities being performed by Terracon, CA Industrial Holdings, LLC (CAI), and Triangle Logistics, LLC, subcontractors at the site. This MMP will accompany the final geotechnical Work Plan that is being developed by Terracon for the site based on review of the proposed redevelopment layout being prepared by Kimley Horn and input from the redevelopment team. It is anticipated that this MMP will be amended as site redevelopment activities and interaction with the Respondents (BFI Waste Systems of North America, LLC and BNSF Railway) evolve, more regulatory information and guidance is developed, and site construction methodologies are understood. The site is currently in its preliminary planning stages.

2.0 SITE BACKGROUND

Terracon prepared a Phase I ESA for the site for CA Industrial Holdings, LLC, draft report dated August 12, 2020, in general accordance with ASTM E1527-13. The purpose of the Phase I ESA was to review

historical records, document past land uses on the site and adjoining properties and identify possible environmental concerns regarding the site.

Based on a review of historical information, the site appears to have been undeveloped/vacant land from the 1890s until the 1930s. The north-central portion of the site west of Ivy Street was improved with small structures, and activity was apparent in the southwestern portion of the site from 1937 through 1963. The site was officially utilized as a municipal landfill from 1968 to 1975, although aerial imagery suggests unofficial landfilling operations began a year earlier in 1967. Landfilling operations appear to have concluded in 1975 and the site has remained vacant through present day.

Adjoining properties were largely undeveloped to the south and west until the 1970s before being developed for commercial/industrial use. The northern adjoining properties appear to have been developed for agricultural use around the 1930s and was converted to commercial/industrial use starting in the late 1970s. Several historical property uses of concern were identified upgradient of the site to the west and south. Groundwater contamination has either been documented, or is suspected to have occurred, at these properties. However, groundwater impacts at the site are considered a Controlled Recognized Environmental Condition (CREC), based on the site's groundwater use restriction and the operation of the landfill gas extraction system, which is expected to also address potential soil gas impacts from the groundwater plume. See below for more information.

Based on review of regulatory information, the Sand Creek Superfund site consists of four principle units, including the former, L.C. Corp, former Colorado Organic Chemical Co., former Oriental Refinery, and the 48th and Holly landfill. The subject site is located within the bounds of the 48th and Holly landfill. The former L.C. Corp, Colorado Organic Chemical, and Oriental refinery facilities are located northwest and downgradient of the site. In 1982, the 48th and Holly landfill along with the three adjacent chemical production or storage facilities, were listed by the EPA as the Sand Creek Superfund site. Six Operable Units (OUs) were identified for the Sand Creek Superfund site of which two, OU3 and OU6 apply to the landfill.

OU3 includes air, soil and water (both surface water and groundwater) contamination in the vicinity of the landfill, and OU6 includes gaseous emissions from the landfill. Response actions established as part of the Record of Decision (ROD) for OU3 and OU6 included preventing dermal contact with landfill contents through the maintenance of an engineered soil cover, restricting the use of underlying groundwater through the establishment of an environmental covenant, and collecting and controlling gaseous landfill emissions through the installation and maintenance of an active landfill gas collection system. Methane gas was detected during construction activities on a nearby water utility project and initial investigations led by the Colorado Department of Public Health and Environment (CDPHE), Tri-County Health, and South Adams Fire district identified the 48th and Holly site as a source of regional landfill gas impacts. Initial passive and active landfill gas vent systems were installed between 1978 and 1981, and in 1991, Burlington Northern Railroad [now Burlington Northern Santa Fe (BNSF) Railway Company] and BFI (later Republic Services, Inc., now BFI Waste Systems of North America, LLC), the Respondents, replaced the early landfill gas collection systems with the current landfill gas collection system.

According to EPA investigation documents, landfill disposal operations at this facility began around 1967 and the facility officially operated as a municipal waste landfill from 1968 until 1975. According to the landfill refuse thickness investigation conducted by Harding Lawson Associates (HLA) in August 1991 and reported to EPA as part of the Remedial Investigation Summary Report for the Sand Creek Superfund site, refuse was encountered at the site in thicknesses ranging from approximately 14 feet along the northern site boundary to approximately 40 feet below ground surface (bgs) along southern property line. Refuse was reported to include construction debris as well as commercial and residential refuse. Hazardous materials were not documented to have been disposed of in the landfill; however, they were suspected to be present by EPA investigators. Terracon notes that native soils present beneath the fill material do not appear to have been characterized as part of the EPA led investigations. Refuse thickness, landfill gas production, and groundwater quality assessments appear to have been the primary focus of site characterization activities.

The groundwater monitoring program established as part of the response actions has included the collection of groundwater data from monitoring points both upgradient and downgradient of the site since 1986. Based on Terracon's review of historical groundwater data presented in the Fifth 5-year Review Report prepared by ERM in 2015, concentrations of contaminants of concern (COCs) in groundwater at the site are generally declining with the VOC analyte PCE still currently exceeding regulatory standards in two monitoring wells, upgradient monitoring well FIT-MW3, located on the northern (downgradient) side of the former Chemical Sales Corp Superfund Site, and downgradient monitoring well L-15 located on the northerly adjoining Shamrock Foods facility. The reviewed reports attribute the chlorinated solvent contamination to off-site upgradient sources, particularly the adjoining former Chemical Sales Corp facility and landfill leachate is not considered to be negatively affecting regional groundwater quality.

Landfill gas production and the effectiveness of the landfill gas extraction system remedy are monitored through gas monitoring points installed at the site as well as at the flare station located on the western adjoining parcel. Landfill gas concentrations are reported to have declined over time from approximately 35% methane by volume in 1991 to 25% methane by volume in 2015. Uncontrolled, the reported concentrations still represent potentially explosive conditions, and the 2015 5-year review report recommended continued operation of the landfill gas collection system.

Terracon understands that the Sixth 5-Year Report has been prepared. Terracon reviewed current monitoring data which has been incorporated as necessary in Sections 7.2 and 7.3.

The Sand Creek Superfund site was removed from the NPL in December 1996 but both the CDPHE and the EPA retain statutory authority and regulatory oversight for the property. Both real estate parcels associated with this ESA site are subject to Environmental Covenants. The Covenants refer to the ROD and include language specific to continued operation of the landfill gas extraction system and prohibiting use of the property until methane is no longer considered a threat. The Covenants also require notification to CDPHE for its approval of modification requests. The impacts from historical landfill activities, considering the Covenants and other restrictions outlined in the ROD, are considered a CREC to the site.

The former Chemical Sales Corp. Superfund site is located upgradient of the eastern portion of the site and has been identified as the likely off-site source for chlorinated solvent contamination in groundwater beneath the site. This facility has been subject to regulatory action since the 1980s and is considered a CREC with respect to the site due to the groundwater use restriction imposed by the ROD related to historical landfill activities and the requirement to continue operation of the landfill gas extraction system at the site, which is expected to also address potential soil gas impacts from the groundwater plume.

Several additional regulated facilities were identified upgradient of the site, some of which correlate to the historical uses of concern noted above. Groundwater contamination has either been documented or is suspected to have occurred at these properties. However, groundwater impacts at the site are considered a CREC, based on the site's groundwater use restriction and the operation of the landfill gas extraction system, which is expected to also address potential soil gas impacts from the groundwater plume.

3.0 PARTIES INVOLVED

It is Terracon's understanding the following parties are, or may be involved, with the site:

Party	Contact (subject to change)	Role
CDPHE: Brownfields Program and Voluntary Cleanup Program	Mr. Fonda Apostolopoulos fonda.apostolopoulos@state.co.us Mr. Kyle Sandor kyle.sandor@state.co.us	State Regulatory
CDPHE: Superfund and Site Assessment Unit	Ms. Colleen Brisnehan colleen.brisnehan@state.co.us	State Regulatory
EPA	Mr. Sairam Appaji appaji.sairam@epa.gov	Federal Regulatory
Tri-County Health Department	To be determined 303-288-6816	County Regulatory
BFI Waste Systems of North America, LLC	Ms. Victoria Warren vwarren@republicservices.com	Respondent
BNSF Railway Company	Mr. Mike Makerov Mike.Makerov@BNSF.com	Respondent
CA Industrial Holdings, LLC	Mr. Joe Trinkle jtrinkle@ca-ventures.com	Developer
LC Development Consultants LLC	Mr. Lynx Chan lynx.chan@lcdevcon.com	Developer's Consultant
Triangle Logistics Center, LLC	Mr. Michael Podboy mpodboy@ca-ventures.com Mr. Joe Trinkle jtrinkle@ca-ventures.com	Owner

Terracon Consultants, Inc.	Mr. Brian Williams Brian.Williams2@terracon.com Mr. Mark White Mark.White@terracon.com Mr. John Haas John.Haas@terracon.com	Developer's Environmental and Geotechnical Consultant

4.0 INTENDED FUTURE USE

As of the date of this MMP, it is Terracon's understanding that CAI plans to redevelop the property. The proposed development is composed of a commercial logistics center consisting of five buildings and associated drives, parking areas, loading docks, and underground utilities. The initial proposed redevelopment layout' as prepared by Kimley-Horn, and showing the locations of the first geotechnical soil borings advanced at the site, is included as Exhibit 3. This exhibit also depicts the location of known landfill gas extraction system components in relation to proposed site infrastructure. It should be noted that Exhibit 3 shows the first redevelopment layout iteration. A more updated version of the proposed site redevelopment layout with site features and the exiting LFGES is shown on Exhibit 5.

5.0 PLANNED VOLUNTARY REMEDIATION

CA Industrial Holdings, LLC is currently in preliminary planning and redevelopment stages. It is Terracon's understanding that redevelopment at the site will include coordination with the Respondents (BNSF Railway Company and BFI Waste Systems of North America, LLC), as well as multiple State Agencies, the Tri-County Health Department, and the EPA as noted in Section 3.0. At a minimum, individual vapor mitigation systems are anticipated to be designed and installed for each building constructed at the site. This assumption is based on Terracon's experience with CDPHE and the Tri-County Health Department on redevelopment projects at historical landfill properties. It is also anticipated that municipal solid waste and other non-hazardous and/or hazardous waste (i.e., petroleum contaminated soil, drums, containers, waste tires, etc.) could be encountered during site redevelopment.

6.0 EXPOSURE PATHWAY EVALUATION

6.1 Soil Pathways

As noted in Section 2.0, an engineered soil cover was constructed over the landfill to prevent dermal contact with landfill contents. Consequently, it is reasonable to assume that the dermal contact soil exposure route will be completed during geotechnical drilling and trenching to be conducted at the site. In addition, given the heterogenous nature of landfill materials and time period the on-site landfill operated, exposure routes related to soil ingestion and inhalation could also be completed during drilling or trenching.

6.2 Groundwater, Surface Water, and Sediment Pathways

According to the Operation and Maintenance Report No. 39, Remedial Design/Remedial Action, 48th and Holly Landfill, Commerce City, Colorado (ERM, 2020), groundwater exists at depths ranging from approximately 9 to 66 feet bgs, with concentrations of PCE and trichloroethene (TCE) exceeding their respective Colorado Groundwater Quality Standards. As water bearing zones are expected to be encountered during advancement of geotechnical soil borings, the groundwater exposure pathway will be, or will reasonably anticipated to be, completed. Surface water and related sediment were not observed during the Phase I ESA site reconnaissance; thus, these pathways are considered not completed. It should be noted that encountering groundwater during trenching isn't anticipated.

6.3 Vapor Inhalation Pathways

According to the Operation and Maintenance Report No. 39, Remedial Design/Remedial Action, 48th and Holly Landfill, Commerce City, Colorado (ERM, 2020), the average methane concentration as last measured (2019-2020) at the blower inlet port was approximately 24% volume in air. In addition, hydrogen sulfide and VOCs may also be present in the subsurface due to the documented groundwater contamination and anaerobic decomposition of landfill material. As such, the vapor inhalation exposure pathway will be, or will reasonably anticipated to be, completed.

7.0 GEOTECHNICAL DRILLING ACTIVITIES

Terracon personnel will be returning to the site to provide additional geotechnical services for the project. Terracon personnel will advance an additional 33 design level geotechnical soil boring at the site (see Exhibit 4). Terracon personnel will also perform oversight of the injection of low mobility grout (LMG) in four pilot test areas of the site (Exhibit 5). Keller North America will perform the LMG pilot test program to evaluate ground conditions at the site. The grout testing program will evaluate required injection pressures, grout volumes, drilling conditions, hole spacings, depth, and ground and landfill reactions. More information concerning the LMG injection program is provided in Section 8.0 and Appendix A. These geotechnical services will provide additional geotechnical and landfill material date/information to be used in future foundation and building design. These activities are discussed in more detail below.

It should be noted that the number of soil borings to be advanced at the site could increase or decrease based upon several factors including review of the draft preliminary redevelopment plans, preliminary geotechnical soil boring data, and historical documents, and geotechnical information used for design evaluation.

7.1 Landfill Gas Exposure Monitoring Procedures

Geotechnical soil borings are anticipated to be drilled to 60-70 feet bgs to obtain useable geotechnical soil data. Actual depths may vary based on the depths of landfill material at each soil boring location. Soil borings will be advanced using hollow-stem augers which will penetrate household waste,

construction debris, water bearing zones, and general undocumented landfill refuse. Preliminary design and design level geotechnical soil boring locations are shown on Exhibits 3 and 4, respectively.

As landfill material is expected to be encountered, Terracon personnel will prepare a Site-specific Health and Safety Plan (HASP) to facilitate safe drilling activities at the site. The Site-specific HASP will include, among other items, guidance on the use of personal protective equipment and requirements to monitor the atmosphere in and around the borehole/trench location while drilling/trenching to evaluate for the presence of methane, hydrogen sulfide, and VOCs. Personnel will also be equipped with personal hydrogen sulfide detectors. Drilling/trenching will be suspended if methane concentration is continuously measured at 5% or higher of the Lower Explosive Limit (LEL) as measured within 3 feet of ground surface, or if hydrogen sulfide is detected at a concentration of 5 parts per million (ppm). The borehole/trench will be given time to off-gas and conditions will be reevaluated. It is possible that additional venting or engineered controls may be required, or the interior of the augers may be flooded with drilling fluid, or a particular boring/trench may be abandoned and relocated. Is should be noted that the landfill gas monitoring procedures summarized in Section 7.1 and the Site-specific HASP will also be used to monitor ambient air quality conditions during the performance of work summarized in Section 8.0.

7.2 Soils and Landfill Materials Management

As the site is a historical landfill, investigative derived waste (IDW/auger cuttings/excavated material), anticipated to be composed of soil and landfill refuse, will be containerized for characterization and off-site disposal. Terracon personnel will work with the transporter and receiving landfill to establish a waste profile based on laboratory testing of the generated IDW. IDW will be placed into 55-gallon steel drums or a roll-off container provided by the receiving landfill. The containerized IDW/landfill material will be properly staged in a centralized location portion of the site that can be accessed by a waste transporter. Further discussion concerning identification, characterization, and disposal of IDW/landfill material is presented in Section 9.0 of this MMP.

It should be noted that if drill cuttings do not contain refuse, rather only native soils, the soils will be placed back into the boreholes provided field screening and observations do not indicate the possibility of contaminant impacts.

7.3 Groundwater Management

Production of groundwater is unlikely to occur during drilling due to the depth of the static groundwater aquifer at the site and drilling methodology. The production of groundwater is also not anticipated to occur during the performance of the LMG injection program or trenching summarized in Section 8.0. If groundwater production occurs while performing onsite work, it will be containerized for characterization and off-site disposal. Terracon personnel will work with the receiving landfill to establish a waste profile through analytical testing. Groundwater will be placed into 55-gallon polyethylene drums, which will be relocated from each boring location to a portion of the site that can be accessed by a waste transporter. Alternately generated groundwater may be applied to landfill material generated during drilling, LMG

injection, and/or trenching that is being temporarily stored in 20-cubic yard roll-offs pending characterization and future off-site disposal.

7.4 Drilling Equipment Decontamination

The general contractor and all subcontractors shall verify their equipment is free of contamination prior to mobilization to the jobsite. Decontamination of drilling equipment will consist of physically removing gross contamination with shovels, brushes, or similar tools followed by detergent and water high pressure wash with a potable water rinse. A temporary decontamination pad will be constructed that will allow for the containerization of decontamination fluids, if generated, for off-site disposal. The decontamination pad components will also be containerized for off-site disposal. Decontamination-related IDW will be containerized in 55-gallon drums pending characterization and off-site disposal.

7.5 Abandonment of Geotechnical Soil Borings

Soil borings will be abandoned per 2 CCR 402-2, Rule 16 Standards for Plugging, Sealing, and Abandoning Wells and Boreholes. It is Terracon's understanding that the current landfill cap is 2 feet thick. To comply with the requirements of 2 CCR 402-2, Rule 16.3, Terracon anticipates abandoning the upper 5 feet of each boring by filling it with grout, which appears to be more conservative than the 2 feet of required cover.

8.0 LOW MOBILITY GROUT INJECTIONS AND TEST TRENCHES

8.1 Low Mobility Grout Injection Plan and Procedures

A low mobility grout (LMG) injection program has been proposed as the most practical geotechnical application for ground improvement and building slab support for the proposed site buildings. As such, CAI has subcontracted Keller North America (Keller) to perform a LMG injection pilot test program to better evaluate ground conditions at the site. This pilot test program will provide grouting results which can be analyzed, tested, and used to verify assumptions concerning landfill conditions. The pilot test program will also be used to evaluate required injection pressures, grout volumes, drilling conditions, hole spacing, depth, and ground and landfill reaction.

Keller will provide crew, materials, and labor necessary for the grouting test program. Initially, a nominal 3" casing will be drilled or driven to termination depth of approximately 30 to 35 feet bgs (base of landfill material); grout will be pumped through the casing in the target zone using the below cutoff criteria. Remaining elevations will be pumped and pulled. Keller will do several test grout locations for each building (see Exhibit 5). The grout will be injected to a termination depth at, or just below, the landfill.

Grout will be pumped at each stage until one of the following refusal criteria is met:

- A grout pump gauge pressure of 150-300 pounds per square inch
- A grout volume of 5-9 cubic yards has been injected

- Ground heave or other undesired movement is observed

It should be noted that Terracon and Keller will coordinate with the RP's environmental consultants and use the referenced site exhibits to select the final locations of the LMG injection locations. Selected locations will be placed to avoid locations proximal to extraction wells and other subsurface features associated with the existing landfill gas extraction system. Keller's proposal including graphics is included as Appendix A.

8.2 Test Trenches Plan and Procedures

Following LMG injection and solidification, Terracon personnel will mobilize to the site to oversee a subcontractor (to be determined) perform test trenches in 2 of the 4 LMG pilot test areas. The test trenches will be utilized to visualize and confirm the horizontal and near surface vertical distribution of the LMG within the landfill. The dimensions of each test trench will be approximately 5- to 10-feet deep by 15- to 20-feet long by 3-feet wide. The trench excavations will be completed using a four-wheel drive backhoe. Excavation activities will generate approximately 8- to 22-cubic yards (cyds) of soil and landfill material from each excavation. Of this total, approximately 6- to 9-cyds of landfill cover material will be excavated, segregated, and stockpiled for future use as excavation backfill or reestablishment of the landfill cover. The remainder of the landfill waste material will be directly loaded into 20-cyd roll-offs after inspection, handling, segregating, stockpiling and pending waste characterization and disposal in accordance with applicable sub-sections of Sections 8.0 and 9.0 of this MMP. It should be noted that the two test trenches to be excavated will be chosen by Keller following the LMG injection event and review of generated data.

8.3 Landfill Waste Inspection and Characterization

As waste is excavated, it will be visually inspected for asbestos containing material (ACM) and special or hazardous wastes by trained personnel. These personnel will be Colorado certified asbestos building inspectors (CABIs) with ACM identification experience. ACM work and identified ACM will be managed in accordance with Section 9.2 of this MMP. Unless visual inspection dictates that special handling of waste should occur pursuant to Section 9.0 below, sampling will not be conducted for the soil or waste. Wastes requiring special handling will be profiled by laboratory analyses, manifested, packaged and transported accordingly.

8.4 Segregation, Stockpiling, and Handling

Only under the direction of trained Terracon personnel will handling of any wastes be completed. When handling is required, the following precautions will be used:

- Handling will be minimized whenever possible;
- When necessary, handling will be employed by mechanical means including the

use of site excavation equipment; Pressurized/swelling drums, suspected explosives, potential shock-sensitive materials, or other potentially dangerous items will not be handled until a person with appropriate experience with these situations have been consulted;

- All waste shall be isolated and covered immediately by placing them in steel roll-off containers or steel drums. If not containerized, wastes will be placed on 6-mil plastic sheeting and covered with plastic or tarp, until additional assessment has been completed;
- All stockpiles of waste will remain covered or containerized until final removal;
- The Contractor shall provide suitable signing, fencing and other warning labels meeting the regulatory labeling requirements as needed and to prevent contact with unauthorized personnel and the public;
- Berms or placement of temporary best-management practices (BMPs) might be needed around stockpiles of potentially contaminated material to prevent potentially contaminated stormwater runoff;
- When additional assessment of material indicates that the material does not meet applicable regulatory requirements for disposal as a non-hazardous waste, arrangements will be made for off-site disposal at a licensed facility;
- The wastes that are generated will be managed in accordance with applicable local, state and federal regulations and in general accordance with Section 9.0.

8.5 Heavy Equipment Decontamination

The general contractor and all subcontractors shall verify their equipment is free of contamination prior to mobilization to the jobsite. The backhoe or other large pieces of equipment that are required to work in landfill material and contaminated soil will be decontaminated within a decontamination station or catch basin, constructed out of 10-mil polyethylene sheeting and that is at least 12 inches deep. Primary decontamination of heavy equipment will consist of physically removing gross contamination with shovels, brushes, or similar tools followed by detergent and water high pressure wash with a potable water rinse, if needed. However, if ACM is encountered during the project, a high-pressure wash will not be used; rather, washing will be done under low pressure to avoid splatter. In addition, brushes will only be used with adequate wetting. All decontamination liquids and solids will be contained, and run-on and run-off shall be prevented. Rinsate/runoff will be collected and re-applied to landfill material being managed for offsite disposal or future removal. However, if ACM is encountered, areas where rinsate/runoff have been applied must be covered until removal is conducted or a permanent cover is placed.

If the decontamination pad is breached or otherwise not performing its intended function of collecting waste and providing a barrier to underlying material, then the decontamination pad will be repaired in a timely fashion. If the pad is damaged and potential contaminants of concern have, or may have, cross-contaminated underlying material, then over-excavation in the area of the damaged pad may be conducted.

If ACM is encountered during the project, all disposable PPE, tools and materials used during decontamination (booties, protective coveralls, plastic sheeting, latex gloves, brushes, brooms, etc.) will be disposed of as non-friable asbestos waste, at a licensed landfill. If no ACM is encountered, these items can be managed and disposed of as solid waste.

8.6 Fugitive Dust Control

Facility personnel will be responsible for controlling dust and particulate matter originating from winds, vehicular traffic, and operational equipment. During dry periods, the operator will have the option of using either chemical dust suppressants or water or both to minimize the amount of dust generated at the facility. The contractor shall visually monitor the site for dust control at the site boundary, and ensure compliance with 5 CCR 1001-1, Air Quality Commission Regulations.

Dust control practices that may be used to control air emissions and provide dust suppression at the site include the following:

- Cover inactive exposed faces of material with geomembrane, Visqueen™, or soil
- Seal the exposed soil by moisture conditioning and compacting
- Minimize the distance waste will be pushed in connection with excavation and loading and minimize drop heights when dumping or transferring materials.
- Treat surfaces with water spray, foam spray, hydro-mulch spray, or crusting agents
- Installation of additional fencing or other engineering controls to block wind.

A variety of control and monitoring methods are available. Material, equipment, and related items for monitoring and control will be in place at the site, or made readily available, prior to the start of any excavation activities. Excavation will be temporarily suspended during high wind events, defined as sustained winds of forty miles per hour (40 MPH) or greater, or gusts of fifty-five miles per hour (55 MPH) or greater, expected to persist for one hour or longer, as defined by the National Weather Service. When the conditions meet all the shutdown requirements, the Order for shutdown will be executed. The site will reopen as criteria are met. However, if ACM is encountered, the wind speed criteria and emissions control measures discussed in Section 9.2 will be used.

8.7 Reestablishing the Landfill Cover

Following excavation activities, clean backfill material and top soil (4-inches) will be imported and placed in the excavation in one-foot lifts and compacted to a naturally achievable density using the backhoe. Before the backfill material is imported, a composite soil sample will be collected from the borrow source and submitted for laboratory analysis by the methods listed below:

- VOCs (8260)

- SVOCs-Base Neutral & Acids (8270)
- RCRA metals (6010/7471)

After compaction and grading, the excavation areas will be seeded with a grass mixture appropriate for the site.

9.0 MANAGEMENT OF SPECIFIC WASTE TYPES

The following sections present guidelines for the management of IDW/auger cuttings and landfill material impacted, or potentially impacted, by contaminants of specific waste types.

9.1 Municipal Solid Waste

Municipal solid waste (MSW) is solid waste from residential, commercial, and industrial sources that does not contain hazardous wastes as defined in the Code of Colorado Regulations Hazardous Waste Act (6 CCR 1007-3 Part 260). As the site is a former landfill, it is likely that MSW could be encountered. If MSW is visually identified and comingled with the drill cuttings or encountered in trenches, the following shall be conducted:

- Segregate the MSW, place into 55-gallon drums and transport to a permitted solid waste landfill for disposal; or
- Load the MSW directly into containers (dumpsters) for transport to a permitted solid waste landfill for disposal.

9.2 Asbestos-Containing Material

As ACM could be encountered during drilling or trench excavation activities, this section outlines the applicable asbestos management procedures required by 6 CCR 1007-2 Section 5.5.7 and identifies the standard procedures for initiating subsurface work at the site, maintaining safe work practices during geotechnical-related drilling and trenching, and reducing the potential for asbestos fiber release from the work area.

Soil disturbing activities will be conducted in the presence of a Colorado Certified Asbestos Building Inspector (CABI) trained in accordance with Section 5.5.3.D of 6 CCR 1007-2, Regulations Pertaining to Solid Waste Sites and Facilities. Individuals involved in drilling or trenching operations in areas where asbestos has not been identified, but where there is reason to suspect that asbestos may be encountered, are required to complete 2-hour on-the-job asbestos-contaminated soil awareness training. This training will include site specific hazards and asbestos occurrences on, and in the vicinity, of the site. The training will provide the information necessary for individuals to perform their duties in compliance with the RACS management requirements of 6CCR 1007-2, Part 1, Section 5.5.3.A. This 2-hour awareness training will be conducted by a CABI.

As previously discussed, a Colorado CABI will be on-site during drilling and other earth disturbing activities to observe geotechnical soil boring advancement and test trench excavation activities and evaluate the properties of the generated IDW. If Regulated Asbestos-Containing Soil (RACS) is encountered, the CABI shall monitor wind speeds once per minute for ten minutes every half-hour, using a hand-held wind meter; drilling operations shall be halted if wind speeds exceed 12 mph for more than 20 minutes or if winds gust to over 20 mph. Should the CABI visually identify the presence of suspect ACM, the following steps will be implemented:

1. Drilling or trenching operations shall immediately be halted;
2. The CABI shall collect a bulk sample of the suspect material to be subsequently submitted to an accredited laboratory for analysis for asbestos content via Polarized Light Microscopy (PLM);
3. To facilitate continuous drilling operations, while awaiting results of bulk sample analysis, a regulated work area (RWA) of 10 feet surrounding the drilling portion of the drill rig shall be isolated using stakes and danger tape. Trenching activities may continue within an established RWA if the requirements of 6 CCR 1007-2 Section 5.5.7 are followed while awaiting the results of bulk sample analysis. Note that air monitoring is not required as long as the project duration is less than two days, or for longer project duration projects there are no adjacent receptor zones (i.e., no uncontrolled access within 150 feet of the RWA);
4. Only the CABI and 2-hour awareness trained personnel with appropriate personal protective equipment (booties, gloves and half-face respirators) will be permitted inside the RWA until all visible auger cuttings or excavated materials are properly bagged/drummed or otherwise containerized or covered. Crew members will not remove PPE until drilling or trenching of this location is completed;
5. If only a limited quantity of suspect material is encountered, the CABI will obtain a new 55-gallon drum and insert an asbestos waste bag liner to be positioned inside the RWA. If a large quantity of suspect material is encountered during trenching, the material will either be placed back into the trench and covered or will be placed on plastic sheeting and covered until the suspect material has been deemed not to be asbestos-containing or until it can be transferred to a lined container for offsite disposal. Suspected ACS waste shall not be intermixed with other IDW;
6. Thoroughly wet suspect material and surrounding landfill material/auger cuttings with chemically amended water using a garden sprayer. Do not soak soils, but adequately wet so that no dust (visible emissions) can be seen as soils are shoveled into waste container or removed using a backhoe;
7. If only limited quantities of suspect material are encountered, carefully shovel suspect debris and a minimum of 6 inches of surrounding soils (in all directions) into the ACM waste bag inside the 55-gallon drum;
8. If hand removal is conducted, once visible suspect debris and surrounding 6-inches of soils are packaged in the ACM waste bag, drilling or trenching at this location may continue using appropriate wetting techniques as soil disturbance continues (may require more water volume than can be generated by just a garden sprayer). However, once suspect debris is encountered, all material generated at this location will need to be packaged for disposal as ACM waste unless/until sample analysis results indicate the absence of asbestos;

9. Should further suspect debris be encountered, repeat procedures one through eight until drilling or trenching at this location is completed;
10. If large quantities of suspect material are encountered, either stop work and cover the material or remove the material while continuously spraying a water mist on the area being disturbed to ensure the material is kept adequately wet during disturbance. When conducting mechanical removal of suspect material, remove all suspect material and a minimum of three (3) linear feet of soil or other matrix material, in the direction(s) of planned excavation. The material may be placed directly into a lined container or placed on plastic sheeting and covered until the suspect material has been deemed not to be asbestos-containing or until it can be transferred to a lined container for offsite disposal. After removal of at least three (3) linear feet of material, CABI confirmation that the visible extent of suspect material has been removed from the excavation area, and CABI confirmation that the excavation equipment is free of any visible suspect material, the excavation may continue with adequate wetting;
11. Once drilling or trenching is completed at this location, decontaminate the auger or backhoe bucket and any other portions of the drill rig or backhoe that have come into contact with potentially contaminated soils using hand tools (shovels, nylon brushes while using amended water applied with garden sprayer, etc.). The decontamination of the auger, drill rig, or backhoe can be conducted on a 10-mil poly sheeting drop with bermed/raised edges or over/inside the 55-gallon drum waste container. However, all waste from this decontamination operation must be captured/containerized inside the 55-gallon waste drum lined with the asbestos waste bag(s). Decontamination is considered complete only after no visible soils or debris remain on the equipment/parts known to have come into contact with soils during drilling or trenching at this location.
12. Once decontamination is completed, CABI and other trained personnel can remove work area isolation barrier tape and PPE. The crew shall dispose of all PPE as asbestos-contaminated waste along with auger cutting or excavated material.

In the event that 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, 2019, are confirmed to be encountered during drilling or trenching, it shall be managed in accordance with this MMP as listed above 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 June 30, 2019.

9.3 Petroleum Contaminated Soil

If IDW/auger cuttings or excavated material appear contaminated with petroleum products based on visual observations (stains, colors, or sheen), odor, or elevated concentrations of volatile organic compounds (VOCs) using a photoionization detector (PID), these soils will be segregated, placed in 55-gallon drums or a roll-off container, and samples taken for characterization for off-site disposal, if necessary. Sampling, analyses, and disposition of soils based on analyses is discussed in Section 9.10.

9.4 Hazardous Waste

Laws governing management of hazardous waste are contained in the Colorado Hazardous Waste Act (C.R.S. 25-15-301-316) and the Colorado Hazardous Waste Regulations (6 CCR 1007-3). Solid wastes are considered non-hazardous unless the material is identified by name or it exhibits characteristics of ignitability, corrosivity, reactivity, or toxicity. Listed wastes are found in 6 CCR 1007-3 Part 261 Subpart D. More information on identifying hazardous waste streams can be found in the CDPHE Hazardous Waste Identification Guidance Document dates October 2008.

Generally, solid wastes are considered hazardous if they exhibit a hazardous characteristic such as toxicity, reactivity, ignitability, or corrosivity, or have been specifically listed as hazardous waste by the EPA (i.e., F-,K-,P-, and U-Listed). Listed wastes are specific wastes or mixtures of listed wastes including the following:

- Sludges from production of wood preservatives;
- Heavy metal-based pigments from production of paints;
- Distillation bottoms, still bottoms, heavy ends, spent catalysts, reaction by-products, organic residuals, and bag house dust from the production of organic chemicals;
- Brine purification muds, chlorinated hydrocarbon waste, wastewater treatment sludges, slag, and other residues from the production of inorganic chemicals;
- By-product salts, wastewater treatment sludges, filter solids, still bottoms, heavy ends, distillation residues, and bag house dust from the production of organic chemicals;
- Wastewater treatment sludges and spent carbon from the production of explosives;
- Wastewater treatment float, slop oil solids, heat exchanger sludge, tank bottoms, oi tank sediments, and spent catalysts from petroleum refining;
- Emission control dusts/sludges from iron and steel production;
- Residues from aluminum production;
- Emission control dusts/sludges from secondary lead production;
- Wastewater treatment sludge, distillation residues, and spent activated carbon from the production of veterinary pharmaceuticals;
- Wastewater treatment sludges from production of ink formulations; and,
- Wastewater treatment sludges, decanter tank sludges, tar storage tank residues, and process residues from coking operations.

Focus will be given to drill cuttings and excavated material that have a particle size gradation or consistency different from the native soils which could be from the afore mentioned solids/sludges. If drill cuttings or excavated materials appear contaminated based on visual observations (stains, colors, or sheen), odor, or elevated concentration of volatile organic compounds (VOCs) using a PID, these soils/materials will be segregated and placed in 55-gallon drums or roll-off container for characterization. Sampling, analyses, and disposition of IDW is discussed in Section 9.10.

9.5 Universal Waste

Hazardous waste includes universal waste such as batteries, pesticides, mercury containing switches and thermostats, and lamps. If drill cuttings or excavated materials contain these items in whole or parts, the cuttings/waste materials will be segregated (as discussed above). Sampling, analyses, and disposition of soils is discussed in Section 9.10.

9.6 Polychlorinated Biphenyl Waste

Polychlorinated biphenyls (PCB) are thermally stable and fire-resistant chemicals historically used in hydraulic fluids, heat transfer fluids, lubricants, and plasticizers. Additionally, PCBs were used in electrical equipment including transformers, capacitors, and fluorescent light ballasts. If IDW/auger cuttings or excavated materials containing fragments of these items are visually encountered during drilling or trenching, potential PCB wastes will be segregated, and auger cuttings/excavated materials will be containerized as discussed above. Sampling and analyses are discussed in Section 9.10.

Per EPA regulations, if analytical results show soil containing PCBs greater than 50 parts per million, the soil/waste materials will be containerized, stored, transported, and disposed of in accordance with Toxic Substances Control Act (TSCA) requirements. Permitted PCB disposal facilities in the region include the following:

- Clean Harbors Environmental Services, Inc. Incinerator in Kimball, Nebraska. This hazardous waste storage and treatment facility includes a thermal oxidation incinerator that provides disposal services for PCB wastes, including PCB liquids and solids.
- Lone Mountain Landfill in Waynoka, Oklahoma

9.7 Ash

Ash from incinerators and coal burning operations typically have elevated concentrations of metals. In addition, historically some landfilling operations included burning of waste materials to reduce waste volumes. Therefore, if ACM is encountered in the vicinity of ash there's a potential for the ash to be asbestos-containing. If intact ash is visually observed in auger cuttings/excavated materials or comingled with auger cuttings/excavated materials, it will be placed in 55-gallon drums or a roll-off container and sampled for characterization for disposal. Disturbance of any ash encountered in the presence of suspect ACM will be in accordance with the procedures outlined in Section 9.2. Sampling and analyses are discussed in Section 9.10.

9.8 Metal

There is the potential for scrap metal and metal fragments from materials within the landfill to be comingled with the auger cuttings or excavated materials. If pieces of metal are visually observed in drill cutting or excavated materials, it will be segregated and handled as MSW. Sampling and analyses of metal pieces will not be performed.

9.9 Waste Tires

Waste tires may be encountered during waste excavation. Waste motor vehicle tires and waste tires will be transported and disposed of in accordance with Section 10 of 6 CCR 1007-2. If tires are adjacent to ACM or RACS, they will be decontaminated prior to disposal.

9.10 Waste Characterization Sampling and Analyses

The volume of drill cuttings from the geotechnical investigation and number of samples for analyses for waste characterization is based on the following assumptions:

- Up to 33 soil borings will be advanced for the geotechnical investigation;
- Each soil boring diameter will be approximately four-inches;
- The depth of each soil boring will be approximately 60 feet below ground surface;
- Drill cuttings will be either drummed or place in a roll-off container for characterization.
- Two test trenches will be excavated following the LMP injection program.
- The dimensions of each test trench will be approximately 5- to 10-feet deep by 15- to 20-feet long by 3-feet wide.

The volume of IDW/drill cuttings ultimately will be based on the final number and depth of soil borings advanced at the site. However, 2-3 cubic yards of IDW is currently anticipated.

Excavation activities will generate approximately 8- to 22-cubic yards (cyds) of soil and landfill material from each excavation. Of this total, approximately 6- to 9-cyds of landfill cover material will be excavated, segregated, and stockpiled for future use as excavation backfill or reestablishment of the landfill cover. The remainder of the landfill waste material will be directly loaded into 20-cyd roll-offs after inspection, handling, segregating, stockpiling and pending waste characterization and disposal in accordance with applicable sections within Section 8.0 and 9.0 of this MMP.

Based on Terracon's experience with waste haulers and their respective requirements for soil analyses for decisions regarding receiving facilities, a composite soil sample can be prepared using samples from the containerized material and analyzed for the following parameters (method), at minimum, or as provide by the receiving facility:

- VOCs (8260)

- SVOCs-Base Neutral & Acids (8270)
- PCBs (8082)
- RCRA metals (6010/7471)
- Pesticides (8081)
- Herbicides (8151)
- Full TCLP (1311, various)
- Ignitability (various)
- Reactivity (various)
- Corrosivity (various)
- Asbestos [if encountered] (polarized light microscopy)

If results of the analyses show the soil or waste material to be non-hazardous, the IDW/waste material will be transported off site for disposal at an approved facility.

If results of analyses show soil/waste material to be hazardous, the drums will be manifested and transported off-site for disposal to an approved hazardous Subtitle C waste facility. Hazardous waste disposal facilities located in the region include:

- Clean Harbors Environmental Services, Inc. Incinerator in Kimball, Nebraska;
- Lone Mountain Landfill in Waynoka, Oklahoma;
- Clean Harbors Deer Trail, LLC, (aka Highway 36 Landfill), Adams County, Colorado;
- Arlington Hazardous Waste Facility, 17629 Cedar Springs Lane, Arlington, OR 97812; and,
- Kettleman Hills Hazardous Waste Facility, 35251 Old Skyline Road, Kettleman City, CA.

Hazardous waste shipped from the site will be packaged in accordance with DOT regulations. Drums will be labeled as “Hazardous Waste.” Hazardous waste manifests will note the EPA identification number of the generator, all transporters of the waste, and the ultimate disposal facility.

10.0 LIMITATIONS

10.1 Standard of Care

Terracon’s services 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 period. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of the report. These services were performed in accordance with the scope of work agreed to by CA Industrial Holdings, LLC.

10.2 Additional Scope Limitations

Findings, conclusions and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; 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, nondetectable or not present during these services, and Terracon cannot represent that the property contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during the investigation. Subsurface conditions may vary from those encountered at specific borings or wells or during other surveys, tests, assessments, investigations or exploratory services; the data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

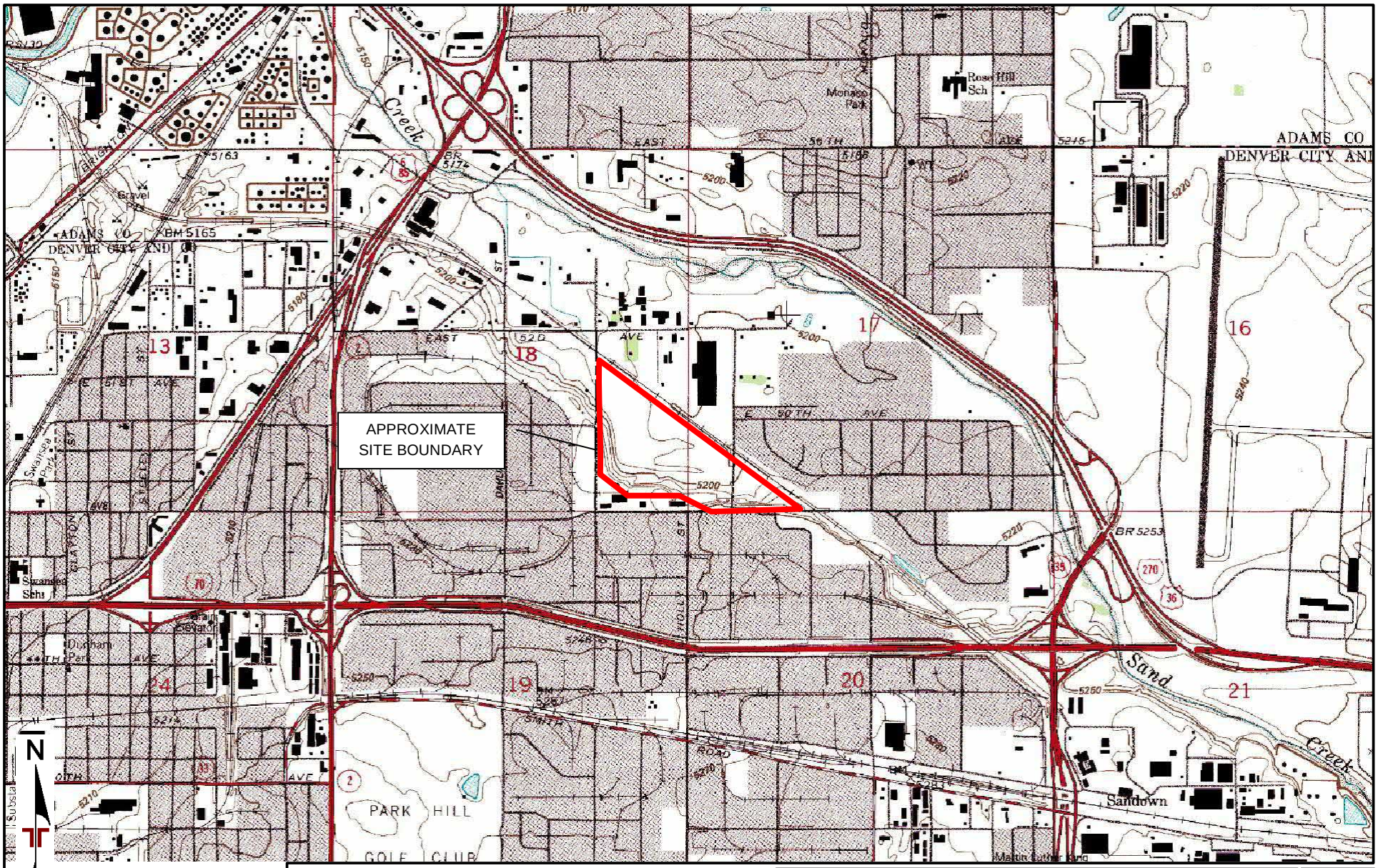
Terracon will not sign waste disposal manifests as the generator. Terracon can sign as agent for the generator if authorized in writing. It is assumed that CA Industrial Holdings, LLC, or CAI's authorized representative will sign waste disposal manifests as the generator.

Terracon understands that the geotechnical evaluation and this associated MMP will be subject to approval from various entities, likely including the client, EPA, CDPHE, BNSF Railway Company, and BFI Waste Systems of North America, LLC. As such, we anticipated having to amend our geotechnical scope of services and this MMP as the project progresses.

10.3 Reliance

This MMP has been prepared for the exclusive use of CA Industrial Holdings, LLC. Any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the property) is prohibited without the express written authorization of CA Industrial Holdings, LLC and Terracon. Any unauthorized distribution or reuse is at the client's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions and limitations stated in Terracon's Consulting Services Agreement and associated reports.

EXHIBITS



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY QUADRANGLES INCLUDE: COMMERCE CITY, CO (1/1/1994).

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

Project Manager:	BMW
Drawn by:	BMW
Checked by:	KRS
Approved by:	KRS

Project No.	25207313
Scale:	1"=2,000'
File Name:	EXHIBITS
Date:	8/3/2020

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

TOPOGRAPHIC MAP

Proposed Sand Creek Industrial Complex

48th Avenue and Ivy Street
Commerce City, CO

Exhibit 1

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

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

Project Manager:	bmw
Drawn by:	bmw
Checked by:	krs
Approved by:	krs

Project No.	25207313
Scale:	AS SHOWN
File Name:	SC X2
Date:	8/11/2020

Terracon
10625 W I70 Frontage Rd N Ste 3
Wheat Ridge, CO 80033-1729

SITE DIAGRAM

Proposed Sand Creek Industrial Complex

48TH Avenue and Ivy Street
Commerce City, CO

Exhibit 2

EXHIBIT 3:
PROPOSED DEVELOPMENT LAYOUT BY KIMLEY-HORN WITH PRELIMINARY GEOTECHNICAL SOIL BORING LOCATIONS

BULDING NO.	BUILDING SF	CLEAR HEIGHT	PARKING
BUILDING 1	162,000	32'	192
BUILDING 2 NORTH	217,080	36'	140
BUILDING 2 SOUTH	63,040	28'	84
BUILDING 3	244,506	36'	164
BUILDING 4	93,600	28'	208
BUILDING 5	60,480	28'	70

PROPOSED GEOTECHNICAL BORING
(APPROXIMATE LOCATION)

Note: The actual number of soil borings will be based upon the final geotechnical Work Plan

PARKING TOTALS

TRAILER PARKING: 103

AUTO PARKING: 858

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

TLC SITE PLAN

02/01/2021

Kimley»Horn

4582 SOUTH ULSTER STREET, SUITE 1500, DENVER, 80237
PHONE: 303-228-2300

EXHIBIT 4:
DESIGN LEVEL GEOTECHNICAL SOIL BORING LOCATIONS

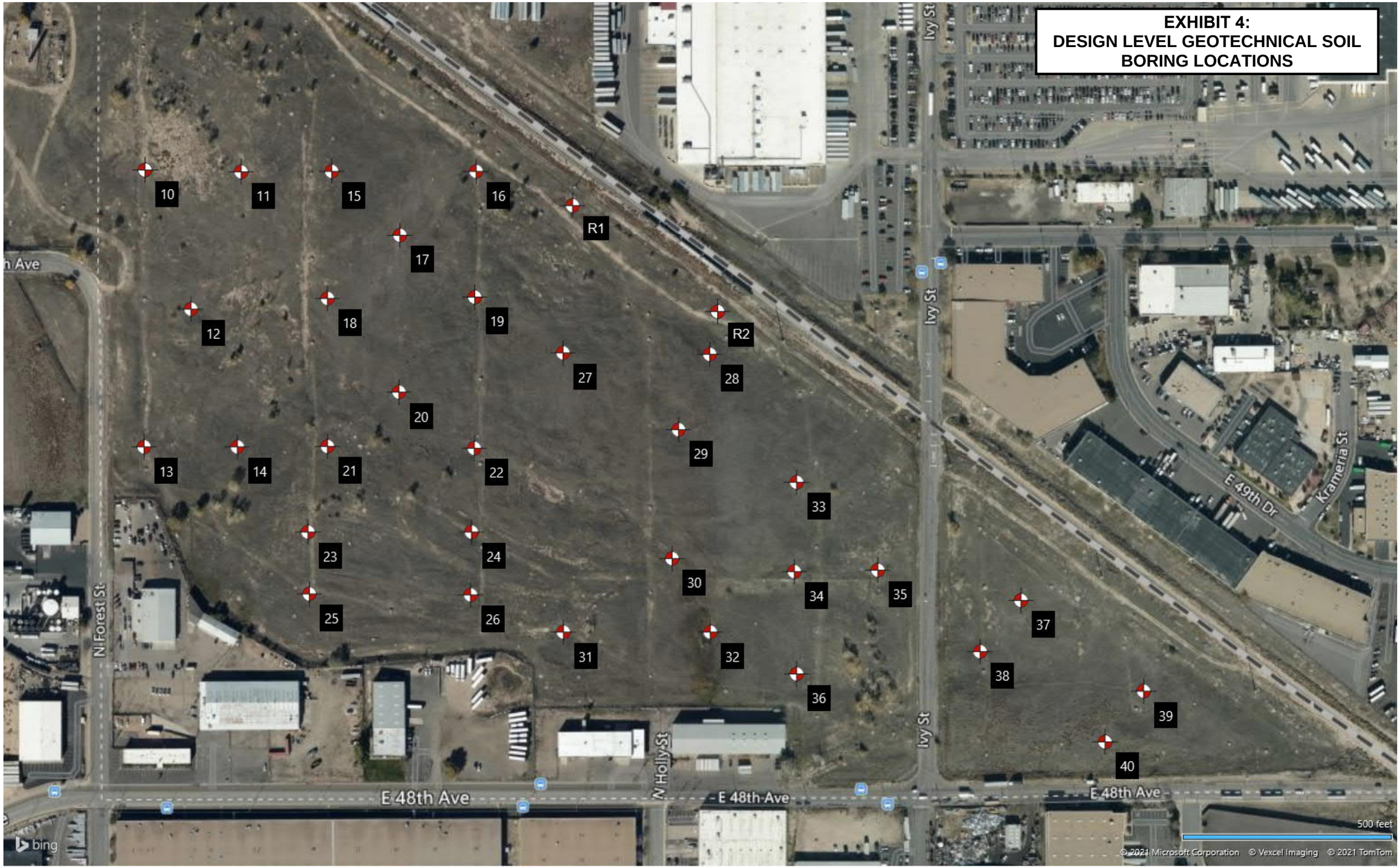


EXHIBIT 5:
SITE LAYOUT WITH PROPOSED LMG INJECTION PILOT TEST AREAS

BULDING NO.	BUILDING SF	CLEAR HEIGHT	PARKING
BUILDING 1	162,000	32'	192
BUILDING 2 NORTH	217,080	36'	140
BUILDING 2 SOUTH	63,040	28'	84
BUILDING 3	244,506	36'	164
BUILDING 4	93,600	28'	208
BUILDING 5	60,480	28'	70

PARKING TOTALS

TRAILER PARKING: 103

AUTO PARKING: 858

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200

TLC SITE PLAN

02/01/2021

Bldg 1 Test Area
5 locations within 50'x50' area

Bldg 2 Test Area
3 locations within 50'x50' area

Bldg 4 Test Area
5 locations within 50'x50' area

Bldg 5 Test Area
3 locations within 50'x50' area

BUILDING 1
162,000 SF

BUILDING 2 NORTH
243,000 SF

BUILDING 2 SOUTH
63,040 SF

BUILDING 3
244,506 SF

BUILDING 4
93,600 SF

BUILDING 5
60,480 SF

TRAILER PARKING AREA

ACCESS FROM FOREST AVE

ACCESS FROM IVY STREET

FOREST STREET

IVY STREET

NEIGHBORING BUILDING

E. 48TH AVE.

APPENDIX A

Keller LMG Injection Proposal

Triangle Logistics

Grouting Test Program Proposal

May 6, 2021

KELLER

FEBRUARY 26, 2021

LC DEVELOPMENT CONSULTANTS LLC
1807 S. WASHINGTON, SUITE 327
NAPERVILLE, IL 60565

ATTENTION: **LYNX CHAN**

REGARDING: **TRIANGLE LOGISTICS CENTER**
GROUTING TEST PROGRAM
FOREST STREET AND EAST 50TH AVE
COMMERCE CITY, CO

Mr. Chan,

As per your request, Keller North America (Keller) is pleased to provide the following proposal for a grouting test program for the new structures proposed at the project site.

This proposal is based on the following:

- Discussions with project team.
- Preliminary borings, photos, grading plans and layout provided.
- Successful design and construction on several adjacent landfill deposits within 10 miles of the site.
- Considerations in Keller's budget proposal dated 2/25/21.

Introduction

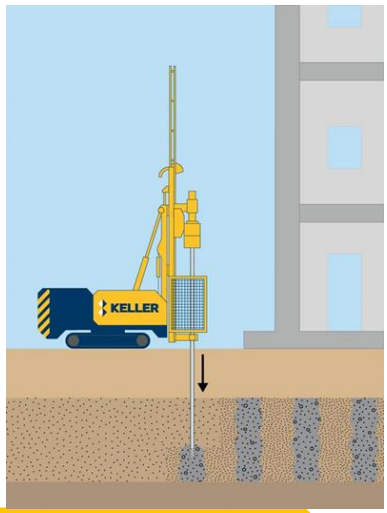
Keller proposes to perform a grouting test program to better identify ground conditions on the site. This additional information will provide grouting results which can be analyzed, tested and used to verify assumptions in an updated cost proposal. The grouting test program will explore encountered required injection pressures, grout volumes, drilling conditions, hole spacings, depth, ground and landfill reaction. Keller is available to discuss data collection that may benefit the geotechnical engineer of record. Other members of the project team will be provided an opportunity to observe the grouting process and general site requirements.

The below test program may be expanded or modified as deemed appropriate to control cost, schedules or other concerns.

Grout Test Program

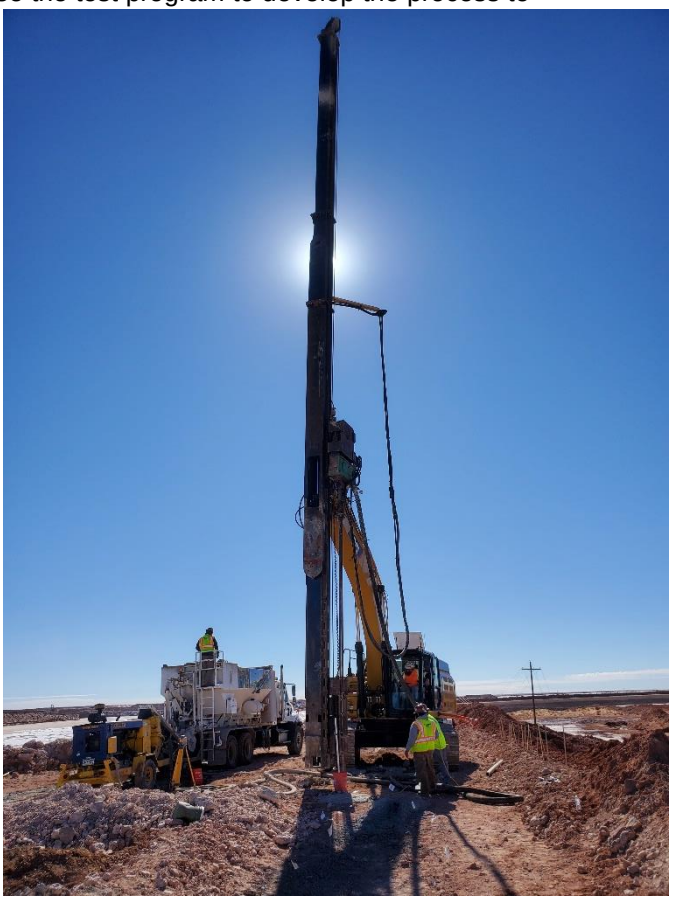
Keller will provide crew, materials, and labor necessary for the grouting test program. Initially, a nominal 3" casing will be drilled or driven to termination depth; grout will be pumped through the casing in the target zone using the below cutoff criteria. Remaining elevations will be pumped and pulled. Grout will be pumped at each stage until one of the following refusal criteria is met:

A grout pump gauge pressure of 150-300 psi
A grout volume of 5-9+ CF
Ground heave or other undesired movement.



The procedure is repeated at each grouting location. Hole layout and cutoff criteria may be modified in the field based on conditions encountered.

Keller understands the concern with spoils and will use the test program to develop the process to understand and minimize spoils generation during the work.



It should be noted that the grouting that is completed during the test program will go towards the treatment of the whole pad. In other words, the money spend here would not need to be re-spent if the team continues with this operation.

Layout
In general Keller recommends performing grouting in the following areas.

In base price
1 - Building 4 North (5 locations)
2 - Building 1 North (5 locations)

The following locations may be added and performed at the day rate costs provided.
Opt. A. - Building 2 (1-3 locations) (~0.5 days)
Opt. B. - Building 3 (1-3 locations) (~0.5 days)
Opt. C. - Building 5 (1-3 locations) (~0.5 days)

Keller will use the available information to place test locations in production grouting areas as possible. This should allow for some of the test program costs to go towards actual production ground improvement for the project.

Exclusions:
The following items are to be provided by Others, if required:

- Access to a minimum of 50'x50' at each test location. Relatively flat. If earthwork/SWPP cannot be provided by others and is required, then additional compensation may be requested. Any required post grouting remediation (grading, SWPP, seeding, etc.) by Others.
- Permits other than for our own transportation.
- Material testing or any other testing. Keller can provide samples for testing by Others. Keller will work with Terracon to develop post-grouting test methods and analysis to be conducted by Terracon.
- Private utility locates or potholing. Keller requires notification of any known utilities.
- Removal of drill and grouting spoils. Disposal and removal of contaminated materials. Keller will provide an Eco pan for washout and will leave any additional spoils onsite.
- Survey to identify the building pads. Keller can provide these services for cost + $1,000.

All existing utility locating and protection to be provided by Others. Any utility within 15' of the work area should be located and potholed. Potholing and visual confirmation of actual depth is required at all utility locations. Actual utility location and access considerations may limit the effectiveness of proposed grouting program. Test locations may be moved to avoid known utility or monitoring locations.

Schedule
We expect the grouting program to take approximately 1 week depending on final scope and encountered conditions. This schedule includes the utilization of one crew. Keller may elect to work Saturdays at its own discretion. We are available to mobilize at an agreed upon time.

Schedule of Prices

Keller North America, Inc. (Keller) proposes to perform the work described in the accompanying letter for the prices listed below. It is understood that the quantities below are estimated, and that final payment will be based on the actual quantities.

Item Description	Quantity	Unit	Unit Price	Extend Price
Test Program 2 Areas (Bldg 4 & 1)	1	LS	$98,000	$98,000.00
Additional Day (if desired)		Shift	$12,500.00	
Standby (Equipment Only)		Shift	$7,000.00	
			Total	**$98,000.00**

Closing
We trust this proposal is of interest to you and we look forward to being of service. If we can be of any assistance in clarifying any points in this proposal, please contact us at 303-469-1136.

Respectfully,

Keller North America, Inc

Joe Amend
Project Manager

Phillip Gallet, PE
Senior Engineer – Business Development Manager

TERMS AND CONDITIONS

The following facilities and services are to be provided to KELLER by others free of all costs to KELLER:

Site Access: Preparation and maintenance of clear, well drained, uninterrupted access ways and working platforms suitable for KELLER equipment moving under its own power. Access includes adequate ramps at suitable levels and should be available at the time and to the extent necessary to suit KELLER's operations. All earth-support structures shall be designed, analyzed, and/or modified accordingly to support KELLER's equipment and operations.

Sequence: Work is to be made available in a sequence that will enable KELLER to work efficiently and systematically without restriction.

COVID-19: Notwithstanding any provision(s) of this Subcontract, if Subcontractor's work is delayed, disrupted, suspended, or otherwise impacted as a direct or indirect result of COVID-19 (coronavirus), including, but not limited to, by (1) disruptions to material and/or equipment supply; (2) illness of Subcontractor's workforce and/or unavailability of labor; (3) government quarantines, closures, or other mandates, restrictions, and/or directives; (4) Owner or Contractor restrictions and/or directives; and/or (5) fulfillment of Subcontractor's contractual or legal health and safety obligations associated with COVID-19; then, Subcontractor shall be entitled to an equitable adjustment to the Subcontract schedule and duration to account for such delays, disruptions, suspensions, and impacts. To the extent the causes identified herein result in an increase to the price of labor, materials, or equipment used in the performance of the Subcontract, Subcontractor shall be entitled to an equitable adjustment to the Subcontract price for such increases, provided Subcontractor presents documentation of such increases (including the original prices) and evidence of such increases (including the original prices) and evidence of Subcontractor's reasonable efforts to find alternative sources of material or equipment supply and/or labor at the original/un-impacted prices.

Progression of the Work: KELLER 's proposal is based upon carrying out the work in an unobstructed manner during regular working hours, Monday through Saturday, in a single uninterrupted visit to the site. KELLER reserves the right to work overtime or weekends at KELLER's own discretion without incurring charges for inspection, site overhead or other consequential charges. In the event that KELLER 's work is interrupted for any reason beyond our control KELLER shall be compensated at the rate identified in the schedule of values for standby of the crew and equipment

Site Preparation and Maintenance: Removal of all surface or subsurface topsoil, brush, organic material and other unacceptable material in accordance with the requirements of the contract documents.

The design and installation of all sediment barriers, silt fence, erosion control and all other appurtenances required by the Storm Water Pollution Prevention Plan developed by Others.

The design and installation of any necessary railings, fences or other protective measures as required by local, state and federal statutes so that workers and the public are protected from falls or accidental entrance into the work site.

Water Control: All work necessary to control and maintain the site and excavation free of ground or surface water problems as they relate to KELLER 's operations.

Prevent surface water and subsurface or groundwater from accumulating in and on project site and surrounding area. Maintain the water table at least 10 feet below the grade of the work area. Provide local disposal of wastewater created by KELLER 's operations.

Site Work: The work under this proposal does not include any excavation, grading or sealing work required on the

site to establish a working platform or to restore the site to the original or finished grade. All such work is to be furnished by others in a timely manner, so as not to impede the progress of the work or cause damage to the finished work.

Excavation and Spoil Removal: All necessary excavation and disposal, including removal of solid and liquid waste materials resulting from the work.

Protection of Adjacent Structures: Any necessary additional protection of existing structures, utilities, or roadways which may affect or impede KELLER's work.

Traffic Control: All pedestrian and vehicular traffic control including signs and barricades, if and when required.

Utilities: KELLER will utilize the local Utility Notification System in order to locate utilities on the site. Location, potholing, removal or relocation of any utilities not located by this service is the responsibility of the Owner, Developer and/or Contractor. KELLER will not accept any responsibility for damage to utilities not located by the one call service. Furthermore, any utilities located by the one call system that are in conflict with KELLER's activities may need to be potholed, removed or relocated at the expense of the Owner and or Contractor if KELLER's work cannot be adjusted. Any costs associated with the adjustment of KELLER's work due to utility conflicts will be the responsibility of the Owner and or Contractor.

KELLER can not and will not be responsible for any damage to any utilities at the site as a result of KELLER's work. The Owner or Others are responsible for locating private utilities at the site prior to KELLER's mobilization to the site and must complete this work to suit KELLER's mobilization schedule. If this work is not done prior to KELLER's mobilization based on its schedule, KELLER will not proceed with mobilization and work. Furthermore, it is possible that utilities may be encountered by KELLER's operations, and the successive grouting operation may cause damage and grouting-up of the encountered utility. This may cause damage to mechanical machinery, utilities, conduits or other facilities. KELLER is not responsible for any such resulting damage or grout intrusion as a result of this remedial work. The Owner understands and accepts that damage to utilities may occur as a result of this work, and accepts all responsibility, including remedial costs for damage to all such utilities which may be damaged.

Layout: Continuous and complete survey and field layout of all necessary lines and grades from which KELLER 's work can be established. Any post construction survey of the work shall also be performed.

Engineering: All plans, specifications and designs, necessary for the work.

Permits and Easements: All site permits and easements required to legally perform the work.

Water Supply: Adequate supply of clean fresh potable water supplied to within 100 feet of KELLER 's operations at the rate of 50 gpm at 50 psi.

Construction Waste Removal: Dumpster and/or other necessary containers for typical construction waste/debris/trash and removal and disposal of such materials. Containers to be provided within 200 yards of KELLER's operations.

Sanitary Facilities: On-site sanitary facilities for the use of KELLER employees.

Holiday and Sunday Work: Due to the unknown start date of this work, no holiday or Sunday pay or travel is included in KELLER's pricing under this proposal. KELLER shall be compensated for any and all costs including markup associated with holiday or Sunday pay or travel expenses form delays beyond KELLER's control or requests to work which extend project schedule over holiday or Sunday periods.

Winter Conditions: Due to the unknown start date of this work, provisions for winter conditions have not been included as part of this proposal. KELLER reserves the right to adjust the pricing and schedule durations presented here-in should any portion of the work be performed November thru March.

Security: Site security during nights and weekends.

Site Yard: An area shall be provided on-site, adjacent to the work, for KELLER's equipment, storage yard, workshop, and site office(s).

Union Manning: Labor to comply with union requirements on KELLER operations other than those specifically discussed in the proposal.

Prevailing Wage Rates: Pricing as presented here-in does not include prevailing wage rates, Davis-Bacon wages, certified payroll or other required wages other than open shop labor rates typically paid by KELLER on Private Commercial work.

Labor Affiliations: This proposal is made with the understanding that KELLER will employ open shop labor. In the event that union labor must be used the client will pay for any cost differential.

Vibration Liability: KELLER cannot accept any liability for disturbance to existing structures and their inhabitants on or near the site. KELLER requires that the Owner/General Contractor indemnify KELLER against any and all claims for such disturbances and also take precautions as necessary to avoid any such claims. This may include vibration monitoring, excavating trenches around the affected area, etc.

Hazardous Material: In the event that KELLER encounters any hazardous material on the site that has not been rendered harmless, KELLER shall immediately stop work in the area affected and report the condition in writing to the Owner and Engineer. To the fullest extent permitted by law, the Owner and Contractor shall indemnify and hold harmless KELLER, their agents, consultants, and employees from and against all claims, damages, losses and expenses, including but not limited to attorney fees arising out of or resulting from performance of the work in the affected area.

Third Party Billing, Document, Payment and Invoice Management: All costs for the utilization by the Owner and/or Contractor of a third-party online or electronic invoice and/or payment management service or system will be borne by the Owner or Contractor and will be added to KELLER's invoice for the work. KELLER will not be responsible for the costs associated with the use of these systems.

The following additional terms and conditions will apply to the proposed work:

Liquidated Damages: The [Owner or Contractor] shall not be entitled to any liquidated damage, delay damage or other time related penalties arising from the work.

Bonds: The cost of a bond premium is not included in the contract price. If desired by and paid by the [Owner or Contractor], KELLER will furnish a Payment and Performance Bond.

Confidentiality: All specifications, drawings, price and technical data submitted by KELLER are to be treated as confidential and shall not be used for any purpose other than the evaluation of this bid, nor shall such information be disclosed to any third party for any purposes without the express written consent of KELLER. Such information shall remain KELLER 's property and be returned to KELLER upon demand.

Buy American: KELLER's pricing as presented here-in does not include material solely manufactured in the United States. If the Buy America provision applies on this project, additional costs will apply.

Period of Acceptance: This Proposal is offered for acceptance for a period of 30 days.

Exclusions: Any items of work not specifically included in this proposal shall not be the responsibility of KELLER.

GENERAL TERMS AND CONDITIONS

Payment Terms: Progress payments will be submitted monthly and shall be payable within 30 days of the invoice date.

All other amounts due, including retention (if any), will be paid in full within 45 days of substantial completion of KELLER's work, regardless of the anticipated project completion date.

An interest charge of 1-1/2% percent per month will be added to invoice amounts not paid within 30 days from date of invoice. All costs of collection, including attorneys' fees and court costs, will be added to unpaid invoice amount.

KELLER shall be paid in full, including retainage no later than 45 days after the substantial completion of KELLER's work.

Changed Conditions: Notwithstanding all clauses of this contract, if KELLER, during its work, encounters 1) subsurface conditions or latent physical conditions which differ from those indicated in this Agreement, or 2) unknown physical conditions of an unusual nature, differing from those ordinarily encountered, then KELLER shall be entitled to an equitable price and schedule adjustment to compensate it for such changed condition.

Full Compensation: It is understood that KELLER will receive full compensation for its work, as set forth in the schedule of prices above for all work performed to the satisfaction of the Owner and/or Contractor regardless of any adjustments, or audits made by the Owner and/or Contractor due to the "Change Order" or "Claim" nature of the work.

Insurance: KELLER will provide the following insurances within limits as shown.

Comprehensive General Liability:	$2,000,000.00
(Combined Single Limit, Bodily Injury and Property Damage)	
Automobile Liability:	$1,000,000.00
(Combined Single Limit, Bodily Injury and Property Damage)	
Workman's Compensation:	$1,000,000.00

Force Majeure: KELLER cannot accept any liability for default or delay in the completion of the work when caused by strike, riot, war, or Act of God or other similar circumstances beyond KELLER control.

Limitation of liability. All private utilities (including utilities left in place) and other services shall be located, exposed, and shown to our on-site representative by Others prior to commencement of work. KELLER will not be liable for any damages to any utilities or services that are not located prior to commencement of the work. Further, while the Parties recognize that some landscaping may become damaged during the process, KELLER agrees to take reasonable steps and exercise caution so as to avoid causing any significant damage to the landscaping. It is further recognized that in the process of releveling, there may be some damage to the structure that occurs. Except and unless KELLER is solely negligent in its operations, KELLER shall not be liable for any structural damage consequently caused by their work.

Liability: No liability can be accepted by KELLER, nor shall KELLER accept as in any way responsibility for defects of any kind whatsoever arising from a cause which is outside KELLER's immediate control or knowledge, or for any

fault in the junction between KELLER's work and subsequent work carried out by others.

Indemnity: Subject to the terms of the Liability Clause above, and to the correct soil conditions having been provided to us prior to our work, KELLER shall **insure**, indemnify and hold harmless the Owner and their employees from and against all claims, damages, losses, and expenses, including attorney's fees, but only to the extent of the negligence of KELLER, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to the injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom, and only to the extent such claim is covered under the General Liability Policy of KELLER.

Standard Construction Contracts: As an alternate to accepting KELLER's proposal as the contract document, KELLER considers the "Standard Form Construction Contract" as prepared jointly by AGC, ASA and the ASC, 1994 Edition to be balanced and fair to all parties. Such contract, with no changes to the standard text thereof, along with this proposal and the specific documents herein, could form the contract for the work herein proposed. Any other contract form will require our review. Where incorporated into a contract, this proposal shall supercede all conflicting terms of such a contract.

Accepted By: _____

Company: _____

Name (print): _____

Title: _____

Date: _____

Appendix 8 – Draft Form for Modification (Pursuant to Paragraph 8)

UNITED STATES DEPARTMENT OF JUSTICE
AND
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 8
AND
THE STATE OF COLORADO

IN THE MATTER OF: Sand Creek Superfund Site Operable Units 3 & 6 Commerce City, Colorado Triangle Logistics Center, LLC, Owner Proceeding Under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601-9675	CERCLA Docket No. CERCLA-08-2022-0005 **ADMINISTRATIVE SETTLEMENT AGREEMENT FOR RESPONSE ACTIONS AND PAYMENT OF RESPONSE COSTS BY PROSPECTIVE PURCHASER**

MODIFICATION TO ADMINISTRATIVE SETTLEMENT AGREEMENT FOR RESPONSE ACTIONS AND PAYMENT OF RESPONSE COSTS BY PROSPECTIVE PURCHASER FOR TRANSFER OF CERTAIN RIGHTS, BENEFITS, AND OBLIGATIONS

[Triangle Logistics Center, LLC (TLC/Transferor)] and [full name of Metropolitan District] (Transferee), [a Title 32 Metropolitan District formed pursuant to Colorado law] certify the following information is true and accurate:

1. TLC, the U.S. Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) intend to transfer certain rights, benefits, and obligations relating to the property it owns within the former Sand Creek Superfund Site to Transferee. This Modification effectuates that transfer pursuant to Paragraph 8 of the Administrative Settlement Agreement for Response Actions and Payment of Response Costs by Prospective Purchaser dated [date] (Settlement).

2. The Settlement concerns the Property described in Paragraph 1 of the Settlement and as set forth in Attachment A to this Modification.

3. The Transferee has reviewed the Settlement. Transferee acknowledges that the Property is part of the Sand Creek Superfund Site (Site). The remedial Work Plan appended to the Settlement (Work Plan) describes the activities TLC must perform to implement the response actions at the Property pursuant to the Settlement. TLC will transfer to Transferee its obligations relating to the performance of the following elements of the Work Plan: [sections 3.0 (Ground Improvement), 4.0 (Site Grading, Utility Infrastructure Installation, and Backfill Import), 5.0 (Landfill Gas Extraction System Modifications), 7.0 (Environmental Monitoring Program Overview), 8.0 (LFGES Monitoring Program), and 9.0 (Groundwater Monitoring Program) (collectively referred to herein as Transferred Obligations)]. [TLC will retain all obligations under the Work Plan not transferred herein.] [Financial assurance obligations pursuant to Section XXV shall be shared between TLCF and Transferee as follows:]

4. Pursuant to Paragraph 8 (Transfer) of the Settlement, Transferee hereby agrees and certifies that Transferee shall be bound by and subject to the terms, conditions, and obligations of the Settlement, including but not limited to Section VII, the certifications contained in Section XVII, contribution protection under Section XXVI, and the financial assurance under Section XXV. Such agreement and certification by Transferee shall become effective only upon approval by EPA and the State of such transfer and counter-signing of this Modification.

5. To the best of its knowledge, Transferee has not caused or contributed to the release or threat of release of any Existing Contamination, as that term is defined in the Settlement, at the Site.

6. Transferee will take reasonable steps, as that term is defined in CERCLA Section 9601(40)(d) [and further described in a certain letter from EPA to Transferee] with respect to future use of the Property.

7. Transferee will permit access to the Property, as set forth in Paragraph 43 of the Settlement.

8. Transferee will exercise appropriate care at the Property and cooperate with EPA on behalf of the United States and CDPHE on behalf of the State of Colorado as set forth in Paragraph 43 of the Settlement.

9. Transferee will not interfere with response actions taken on or around the Property.

10. Transferee acknowledges the rights, benefits, and obligations provided by the Settlement to Transferee for the Property are limited to the Existing Contamination on the Property, as of the Effective Date of the Settlement. With respect to liability for any new hazardous substance, pollutants or contaminants that first become present at the Property after the Effective Date, Transferee has taken steps to avail itself of protections afforded a "bona fide prospective purchaser" and will continue to maintain its status as a "bona fide prospective purchaser" for the duration of its interest in the Property, including taking reasonable steps in accordance with 42 U.S.C. Section 9601(40).

11. By submission of this Modification to EPA and the State, signed by a person authorized to bind the party making this request for the transfer of the covenant not to sue, TLC is requesting that EPA and the State give written consent to the transfer of the rights and benefits set forth in the Settlement at Section XVIII (Covenant Not to Sue) and Section XXVI (Contribution Protection) with respect to the Transferred Obligations, currently held by TLC, to Transferee (Transferred Rights). By countersigning this Certification, EPA and the State hereby provide such written consent for the transfer of the Transferred Rights from TLC to the Transferee. TLC retains all of its rights and benefits, including those set forth in Section XVIII (Covenant Not to Sue) and Section XXVI (Contribution Protection) relating to remedial obligations not transferred to the Transferee.

12. By countersigning this Modification, EPA and the State further acknowledge that TLC reserves the right to assert all defenses to liability of a bona fide prospective purchaser with respect to Existing Contamination at the Property notwithstanding the transfer of some rights, benefits, and obligations to Transferee.

13. By countersigning this Modification, EPA and the State hereby release TLC from all further obligations with respect to the Transferred Obligations.

14. Transferee acknowledges that at any time EPA and/or the State determine that any certification by Transferee is materially inaccurate or incomplete, the Covenant Not to Sue and Contribution Protection set forth in Sections XVIII and XXVI shall be null and void with respect to the Transferee and the United States, EPA, and the State of Colorado reserve any and all rights they may have with respect to the Transferee.

15. [TLC and Transferee] acknowledge that in cases of parties taking title to real property within the Property (and not obligations, hereunder), EPA and the State will direct such parties to the self-implementing statutory liability protections for certain landowners who are not responsible for a property's contamination, included in the 2002 Brownfields Amendments to the Superfund law, intended to allow private parties to save time and costs, in part by avoiding EPA involvement in the majority of private property transactions. EPA's August 25, 2015 Revised Policy on Issuance of Superfund

Comfort/Status Letters may also be of interest to such future parties.

16. For further reference, upon the transfer set forth in Paragraph 8 of the Settlement, all notices and submissions required under the Settlement shall be sent to the following contact person for the Transferee: [name] at [address].

Certified by [full name of District], [a Colorado Title 32 Metropolitan District]

By: _____ Date: _____
[name]
[title at District]

Certified by [Triangle Logistics Center, LLC], [a Delaware limited liability company]

By: _____ Date: _____
[name]
[title at District]

The State of Colorado hereby givens written consent to the transfer certain rights, benefits, and obligations of the Settlement, as described in Paragraph 1 of this Certification.

By: _____ Date: _____
[name]
[title at COAG]

The U.S. Environmental Protection Agency hereby givens written consent to the transfer certain rights, benefits, and obligations of the Settlement, as described in Paragraph 1 of this Certification.

By: _____ Date: _____
[name]
[title at EPA]

ATTACHMENT A

PROPERTY LEGAL DESCRIPTION