



Roll Call Number

Agenda Item Number

13-I

Date September 14, 2020

RESOLUTION APPROVING CONSENT DECREE REGARDING THE DES MOINES TCE SUPERFUND SITE TO ACCEPT TITLE TO THE DICO PROPERTY AND ASSUME RESPONSIBILITY FOR PERFORMANCE OF CERTAIN RESPONSE ACTIONS

WHEREAS, United States of America, the U.S. Environmental Protection Agency (EPA), Dico, Inc., Titan Tire Corporation and Titan International, Inc. have entered into a Consent Decree to settle litigation involving the Des Moines TCE Superfund Site; and

WHEREAS, the City of Des Moines is included as a party to the Consent Decree because it includes terms for the City to accept title to the property owned by Dico, Inc. ("Dico Property") and to assume responsibility for certain environmental response actions for the Dico Property; and

WHEREAS, approval of the Consent Decree, acceptance of title to the Dico Property and assumption of responsibility for performance of certain environmental response actions for the Dico Property in accordance with the terms and conditions of the Consent Decree is in the best interests of the City.

NOW, THEREFORE BE IT RESOLVED by the City council of the City of Des Moines, Iowa that the Consent Decree, on file in Office of the City Clerk, is hereby approved and the Mayor is authorized and directed to sign the Consent Decree on behalf of the City and the City Clerk is directed to complete the authorized agent information.

BE IT FURTHER RESOLVED that the City Manager or his designees are authorized and directed to take all necessary actions to administer, complete and comply with all terms, conditions and the assumed performance of environmental response actions set out in the of the Consent Decree including, but not limited to, the acceptance of title to the Dico Property, operation and maintenance of groundwater treatment systems including sampling and reporting, operation and maintenance of the existing asphalt cap including inspections and reporting, preparation of operation and maintenance plans and other required plans for EPA approval, and execution and recording of required environmental covenants.

★ **Roll Call Number**

Agenda Item Number

73-7

Date September 14, 2020

BE IT FURTHER RESOLVED that the City Manager or his designees are authorized and directed to prepare necessary plans and actions and coordinate with the EPA for the demolition and removal of the production and office buildings on the Dico Property.

(Council Communication No. 20.389)

Moved by _____ to adopt.

APPROVED AS TO FORM:

/s/ Lawrence R. McDowell
 Lawrence R. McDowell
 Deputy City Attorney

COUNCIL ACTION	YEAS	NAYS	PASS	ABSENT
COWNIE				
BOESEN				
GATTO				
GRAY				
MANDELBAUM				
VOSS				
WESTERGAARD				
TOTAL				
MOTION CARRIED			APPROVED	

CERTIFICATE

I, P. Kay Cmelik, City Clerk of said City hereby certify that at a meeting of the City Council of said City of Des Moines, held on the above date, among other proceedings the above was adopted.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal the day and year first above written.

_____ Mayor

_____ City Clerk

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF IOWA**

UNITED STATES OF AMERICA,)
)
 Plaintiff,)
)
 v.)
)
 DICO, INC. and)
 TITAN TIRE CORPORATION,)
)
 Defendants.)
 _____)

No. 4:10-cv-00503-RP-RAW

CONSENT DECREE

CONSENT DECREE

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I. BACKGROUND

A. On October 26, 2010, the United States of America (“United States”), on behalf of the Administrator of the U.S. Environmental Protection Agency (EPA), filed a complaint in this matter pursuant to Section 107(a) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9607 (CERCLA), seeking reimbursement of response costs incurred or to be incurred for response actions taken at or in connection with the release or threatened release of hazardous substances at the Southern Iowa Mechanical Site in Ottumwa, Iowa (the “SIM Site”), and pursuant to Sections 106(b)(1) and 107(c)(3) of CERCLA seeking civil penalties and punitive damages for violations of a Unilateral Administrative Order issued with respect to the Des Moines TCE Superfund Site in Des Moines, Iowa (the “Des Moines TCE Site”).

B. On February 25, 2014, the Court entered judgment in this case against Defendant Dico for \$1.62 million in civil penalties related to the Des Moines TCE Site, which was affirmed on appeal on December 10, 2015. On September 7, 2017, the Court entered judgment against Defendants jointly and severally for the United States’ past response costs (totaling \$5,454,370 at the time of trial) and future response costs at the SIM Site, and against Defendant Dico for \$5,454,370 million in punitive damages related to the Des Moines TCE Site. These judgments were affirmed on appeal on April 11, 2019.

C. On April 21, 1995, the United States, on behalf of EPA, filed a complaint in Case No. 4-95-cv-10289 (S.D. Iowa) pursuant to Section 107(a) of CERCLA, seeking reimbursement of response costs incurred or to be incurred for response actions taken at or in connection with Operable Unit 01 of the Des Moines TCE Site. On March 29, 2000, the Court entered judgment against Defendant Dico for \$4,120,426.67 in past response costs and for future response costs with respect to the Des Moines TCE Site. That judgment was affirmed on appeal on November 27, 2001. Defendant Dico has not paid this judgment.

D. Defendant Dico has submitted evidence in this case showing that it has no source of income and essentially no assets other than its property at 200 Southwest 16th Street in Des Moines, Iowa (the “Dico Property”).

E. Dico’s ultimate parent corporation, Titan International, Inc. (“Titan International”) holds an \$11 million mortgage lien on the Dico Property, which it contends is superior to all other liens, including those filed by the United States to enforce judgments it has obtained against Defendant Dico.

F. Remedies addressing contamination at the Des Moines TCE Site have been in place since the 1990s.

i. The Record of Decision (ROD) for OU1 was signed on July 21, 1986 to address trichloroethene-impacted groundwater infiltrating the city of Des Moines public water supply through the DMWW north infiltration gallery. The major components of the OU1 remedy, as implemented, included the installation and operation of a groundwater extraction and treatment system consisting of groundwater extraction wells and an air stripper and the installation of groundwater wells across the site.

ii. In March 1994, the EPA issued a Unilateral Administrative Order, or UAO, to Dico for the Building Response Action to address numerous hazardous substances within several on-site buildings. The hazardous substances were identified as pesticides, herbicides, dioxins, and PCBs. The action called for repairing, sealing, and protecting building insulation; cleaning the interior surfaces of the buildings and encapsulation of building floors and walls by sealing with durable epoxy/urethane protective coating to prevent direct-contact exposures. In June 1994, the EPA issued a second UAO to Dico for the Surface Capping Response Action. The action required either excavation of soils or capping of soils containing the pesticides aldrin, dieldrin, and chlordane above specified health-based levels. In December 1995, the EPA issued an Administrative Order on Consent to the DiChem Customer Group for the South Pond Area Response Action. The action required characterization, excavation, and offsite disposal of soils containing aldrin and chlordane above health-based cleanup levels from a drainage ditch adjacent to the east side of the Dico property and around the South Pond Area. The onsite buildings, the contaminated soil, and the South Pond Area are cumulatively OU2 and OU4.

iii. The ROD for OU2 and OU4 was signed on December 13, 1996. Major components of the remedy included continued maintenance activities.

iv. The ROD for OU3 was signed on September 18, 1992 to address potential sources of groundwater contamination in the area north of the Raccoon River, commonly known as the "North Plume." The North Plume contains chlorinated VOCs present in low concentrations with no identified source. The ROD selected a no action remedy with periodic groundwater monitoring, acknowledging that groundwater from the OU3 area will continue to be captured and treated by the OU1 extraction and treatment system. The Iowa Department of Natural Resources currently manages OU3.

G. Defendants contend that the Dico Property has value exceeding the remaining costs of response at the Des Moines TCE Site. The Parties agree that transfer of the Dico Property to a third party willing and able to complete remaining response actions at the Dico Property and return the Dico Property to use serves the public interest and goals of CERCLA.

H. The City of Des Moines is willing and able to accept title to the Dico Property and to assume responsibility for the performance of certain response actions in accordance with the terms of this Consent Decree. The resolution of the City of Des Moines' potential CERCLA liability arising from its acquisition of the Dico Property pursuant to this Consent Decree, in exchange for provision by the City of Des Moines of a substantial benefit through its performance of certain response actions at the Dico Property, as set forth in this Consent Decree, is in the public interest.

I. Solely for the purposes of Section 113(j) of CERCLA, 42 U.S.C. § 9613(j), the remedy set forth in the applicable RODs and the Work to be performed by the City shall constitute a response action taken or ordered by the President for which judicial review shall be limited to the administrative record.

J. The United States has incurred \$6,994,240 in past response costs at the SIM Site (comprising \$2,970,799 in EPA response costs through August 21, 2019 and \$4,023,441 in DOJ response costs through August 3, 2019).

K. The United States believes that it has potential claims against Titan International under general principles of corporate veil-piercing that could permit recoveries against it for judgments entered against Dico with respect to the Dico and SIM Sites.

L. The United States and Settling Defendants agree, and this Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith, that settlement of this matter without further litigation and without any further admission or adjudication of any issue of fact or law is appropriate and will avoid prolonged and complicated litigation between the Parties, and that this Consent Decree is fair, reasonable, and in the public interest.

THEREFORE, with the consent of the Parties to this Decree, it is ORDERED, ADJUDGED, AND DECREED:

II. JURISDICTION

1. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1345 and 42 U.S.C. §§ 9606, 9607 and 9613(b). With respect to obligations imposed by this Consent Decree on the City of Des Moines, the Court has subject matter jurisdiction under 28 U.S.C. § 1367 and 28 U.S.C. § 1651 and will have subject matter jurisdiction pursuant to Section 113(b) of CERCLA, 42 U.S.C. § 9613(b), for any enforcement action brought pursuant to this Consent Decree. The Court also has personal jurisdiction over Settling Defendants and the City of Des Moines. Solely for the purposes of this Consent Decree, Settling Defendants waive all objections and defenses that they may have to jurisdiction of the Court or to venue in this District. Settling Defendants and the City of Des Moines shall not challenge entry or the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.

III. PARTIES BOUND

2. This Consent Decree is binding upon the United States, and upon Settling Defendants and their successors and assigns, and upon the City of Des Moines. Any change in ownership or corporate or other legal status, including but not limited to, any transfer of assets or real or personal property, shall in no way alter the status or responsibilities of the City of Des Moines or of Settling Defendants under this Consent Decree.

IV. DEFINITIONS

3. Unless otherwise expressly provided in this Consent Decree, terms used in this Consent Decree that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meanings assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Consent Decree or its appendices, the following definitions shall apply:

“Affected Property” means all real property at the Dico Property and any other real property, owned or controlled by Owner Settling Defendant, where EPA determines, at any

time, that access or land, water, or other resource use restrictions are needed to implement response actions at the Des Moines TCE Site, including, but not limited to, the Dico Property.

“CERCLA” shall mean the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675.

“City of Des Moines” or “City” shall mean the City of Des Moines, Iowa.

“Consent Decree” shall mean this Consent Decree and all appendices attached hereto. In the event of conflict between this Consent Decree and any appendix, the Consent Decree shall control.

“Day” or “day” shall mean a calendar day. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period shall run until the close of business of the next working day.

“Des Moines TCE Special Account” shall mean the special account, within the EPA within the EPA Hazardous Substance Superfund, to be established by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C. § 9622(b)(3) for the receipt of a portion of funds paid by Settling Defendants.

“Dico Property” shall mean the property owned by Defendant Dico located at 200 Southwest 16th Street in Des Moines, Iowa, encompassing approximately 40 acres, and further defined in Appendix B to this Consent Decree.

“Des Moines TCE Site” shall mean the Des Moines TCE Superfund Site in Des Moines, Iowa, CERCLIS ID# IAD980687933, encompassing approximately 200 acres, located at 200 Southwest 16th St. in Des Moines, Iowa, and generally shown on the map included in Appendix A.

“DOJ” shall mean the U.S. Department of Justice and its successor departments, agencies, or instrumentalities.

“Effective Date” shall mean the date upon which the approval of this Consent Decree is recorded on the Court’s docket.

“EPA” shall mean the U.S. Environmental Protection Agency and its successor departments, agencies, or instrumentalities.

“EPA Hazardous Substance Superfund” shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

“Existing Contamination” shall mean:

- a. any hazardous substances, pollutants or contaminants present or existing on or under the Dico Property as of the Effective Date;
- b. any hazardous substances, pollutants or contaminants that migrated from the Dico Property prior to the Effective Date; and

c. any hazardous substances, pollutants or contaminants presently at the Site that migrate onto or under or from the Dico Property after the Effective Date.

“Future Response Costs” shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing deliverables submitted pursuant to this Consent Decree with respect to the Des Moines TCE Site, in overseeing implementation of the Work, or otherwise implementing, overseeing, or enforcing this Consent Decree, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, community involvement costs, the costs incurred pursuant to Paragraph 16 (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 ICs, including, but not limited to, the amount of just compensation), Paragraph 18 (Emergency Response/Release Reporting), Paragraph 21 (Work Takeover), and Paragraph 25 (Dispute Resolution).

“Interest” shall mean 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 shall be 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>.

“Institutional Controls” or “ICs” shall mean Proprietary Controls and state or local laws, 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 Des Moines TCE Site; (b) limit land, water, or other resource use to implement, ensure non-interference with, or ensure the integrity of the removal action; and/or (c) provide information intended to modify or guide human behavior at or in connection with the Des Moines TCE Site.

“National Contingency Plan” or “NCP” shall mean 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.

“Owner Settling Defendant” shall mean Defendant Dico.

“Paragraph” shall mean a portion of this Consent Decree identified by an Arabic numeral or an upper or lower case letter.

“Parties” shall mean the United States, Settling Defendants, and the City of Des Moines.

“Performance Standards” or “PS” shall mean the cleanup levels and other measures of achievement of the remedial action objectives, as set forth in the RODs for OU-01, OU-02, and OU-04.

“Plaintiff” shall mean the United States.

“Proprietary Controls” shall mean easements or covenants 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 by the owner in the appropriate land records office.

“Reimbursable Response Costs” shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs with respect to 1) any partial or complete Work Takeover under Paragraph 21 and 2) the response actions set forth in Section IX.

“Remedial Action” or “RA” shall mean the remedial action selected in the RODs for OU-01, OU-02, and OU-04.

“Section” shall mean a portion of this Consent Decree identified by a Roman numeral.

“Settling Defendants” shall mean Dico, Inc., Titan Tire Corporation, and Titan International, Inc.

“SIM Site” shall mean the Southern Iowa Mechanical Site in Ottumwa, Iowa, CERCLIS ID# IAN000705908, encompassing approximately 2.6 acres, located at 3043 Pawnee Drive in Ottumwa, Wapello County, Iowa, and generally shown on the map included in Appendix A.

“Sites” shall mean, collectively, the Des Moines TCE Site and SIM Site.

“State” shall mean the State of Iowa.

“Statement of Work” or “SOW” shall mean the document describing the activities the City must perform to implement response actions pursuant to this Consent Decree, as set forth in Appendix D, and any modifications made thereto in accordance with this Consent Decree.

“Transfer” shall mean 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” shall mean the United States of America and each department, agency, and instrumentality of the United States, including EPA.

“Waste Material” or “Waste Materials” shall mean (1) any “hazardous substance” under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (3) any “solid waste” under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); (4) any “hazardous waste” under Iowa Code Section 455B.411 and 455B.464; and (5) any “special waste” under Iowa Code Section 567.100.2

“Work” shall mean all activities and obligations the City is required to perform under this Consent Decree except those required by Paragraph 19 (City Record Retention).

V. PAYMENT OF JUDGMENTS

4. **Payments by Settling Defendants.** Settling Defendants shall pay a total of \$11.5 million, plus Interest, on the schedule set forth in this Paragraph. Of the principal amount, \$7,000,000 shall constitute reimbursement of response costs incurred by the United States relating to the SIM Site, \$1,580,588 shall constitute civil penalties and punitive damages related to the Des Moines TCE Site, and \$2,919,412 shall constitute reimbursement of response costs incurred by the United States relating to the Des Moines TCE Site.

a. Not later than 30 days after the Effective Date, Settling Defendants shall pay to EPA \$9,000,000, plus an additional sum for Interest on that amount calculated from September 24, 2019 through the date of payment.

b. Not later than one year after the Effective Date, Settling Defendants shall pay to EPA an additional \$1,500,000, plus an additional sum for Interest on that amount calculated from September 24, 2019 through the date of payment.

c. Not later than two years after the Effective Date, Settling Defendants shall pay to EPA an additional \$1,000,000, plus an additional sum for Interest on that amount calculated from September 24, 2019 through the date of payment.

5. Settling Defendants shall make payment at <https://www.pay.gov> or via Fedwire Electronic Funds Transfer (EFT) to the U.S. Department of Justice account, in accordance with instructions provided to Settling Defendants by the Financial Litigation Unit (FLU) of the U.S. Attorney's Office for the Southern District of Iowa after the Effective Date. The payment instructions provided by the FLU will include a Consolidated Debt Collection System (CDCS) number, which shall be used to identify all payments required to be made in accordance with this Consent Decree. The FLU will provide the payment instructions to:

Todd Shoot
Titan International, Inc.
SVP, Investor Relations & Treasurer
2701 Spruce Street | Quincy, Illinois 62301
Office: 217-221-4416
Email: todd.shoot@titan-intl.com

on behalf of Settling Defendants. Settling Defendants may change the individual to receive payment instructions on their behalf by providing written notice of such change to DOJ and EPA in accordance with Section XVIII (Notices and Submissions).

6. Settling Defendants shall not deduct any penalties or punitive damages paid under this Decree pursuant to this Section or Section 26.c (Failure to Comply with Consent Decree) in calculating their federal income tax.

7. **Deposit of Payment.** Of the total amount to be paid pursuant to Paragraph 4.a, \$2.9 million shall be deposited by EPA in the Des Moines TCE Special Account to be retained and used to conduct or finance response actions at or in connection with the Des Moines TCE Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund,

and the remainder shall be deposited by EPA in the EPA Hazardous Substance Superfund. The amounts to be paid pursuant to Paragraphs 4.b and 4.c shall be deposited by EPA in the EPA Hazardous Substance Superfund.

8. **Notice of Payment.** At the time of each payment, Settling Defendants shall send notice that payment has been made: (a) to EPA in accordance with Section XVIII (Notices and Submissions); (b) to DOJ by email or by mail in accordance with Section XVIII (Notices and Submissions); and (c) to the EPA Cincinnati Finance Center in accordance with Paragraph 68.

Such notice shall reference the CDCS Number, Site/Spill ID Number A7K9 for the Southern Iowa Mechanical Site, Site/Spill ID Number 0725 for the Des Moines TCE Site, and DJ Number 90-11-3-09925.

VI. TRANSFER OF DICO PROPERTY

9. Property Transfer to City.

a. Not more than 180 days after the Effective Date, as further described herein and upon mutual agreement as to the time of transfer, Defendant Dico shall convey the Dico Property to the City via donation at no cost to the City (provided that the City and Dico may agree instead to a sale transaction with a sale price of no more than \$10). Dico shall convey the Dico Property to the City in fee simple by general warranty deed and free and clear of all liens and encumbrances. The City shall accept the conveyance of title.

b. Prior to the conveyance described in this section, Dico shall provide the City and its representatives with access to the Dico Property in a timely manner upon request.

c. Dico shall pay all costs associated with the conveyance of the Dico Property, including closing costs, filing fees, and title insurance fees (but not including any legal or other fees incurred by the City, EPA, DOJ, or any other governmental entity).

VII. ADDITIONAL OBLIGATIONS OF SETTLING DEFENDANTS

10. Not more than 30 days after the Effective Date, Titan International shall release all liens it holds, cancel and forgive all mortgages and/or lines of credit it has issued, cancel any Uniform Commercial Code filings it has made, and otherwise release, cancel, and/or withdraw any other title encumbrance it has placed, relating to the Dico Property.

VIII. OBLIGATIONS OF THE CITY OF DES MOINES

11. **Certification.** By entering into this Consent Decree, the City of Des Moines certifies that to the best of its knowledge and belief it has fully and accurately disclosed to EPA all information known to the City and all information in the possession or control of its 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 Dico Property and to its qualification for this Consent Decree. The City 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 or pollutants or contaminants at the Des Moines TCE Site, as of the Effective Date.

12. **Notice to Work Contractors, Representatives.** The City shall provide a copy of this Consent Decree to each contractor hired to perform the Work required by this Consent Decree and to each person representing the City with respect to the Dico Property or the Work, and shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this Consent Decree. The City or its contractors shall provide written notice of the Consent Decree to all subcontractors hired to perform any portion of the Work required by this Consent Decree. The City shall nonetheless be responsible for ensuring that its contractors and subcontractors perform the Work in accordance with the terms of this Consent Decree.

13. **Insurance.** EPA acknowledges that the City is self-insured and will not require additional insurance to be provided by the City. Thus, no later than 30 days before commencing any on-site Work, the City shall ensure that any and all contractors or other parties performing work at Dico Property shall secure, and shall maintain, for the duration of operation and maintenance, commercial general liability insurance with limits of \$1 million per occurrence, and automobile liability insurance with limits of liability of \$1 million per accident. In addition, for the duration of the CD, the City 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 work on behalf of the City in furtherance of this CD.. The City shall ensure that all submittals to EPA under this Paragraph identify the Des Moines TCE Site and the docket number for this action.

14. **Work to be Performed.**

a. The City shall perform, at a minimum, all actions necessary to implement the SOW (attached as Appendix D).

b. The City shall perform all actions required by this Consent Decree in accordance with the SOW and all EPA-approved, conditionally-approved, or modified deliverables as required by the SOW. All deliverables required to be submitted for approval under the CD or SOW shall be subject to approval by EPA in accordance with ¶ 7.3 (Approval of Deliverables) of the SOW.

15. **Modification of SOW or Related Deliverables**

a. If EPA determines that it is necessary to modify the work specified in the SOW and/or in deliverables developed under the SOW in order to achieve and/or maintain the Performance Standards or to carry out and maintain the effectiveness of the RA, and such modification is consistent with the Scope of the Remedy set forth in ¶ 2 (Scope of Remedy) of the SOW, then EPA may notify the City of such modification. If the City objects to the modification they may, within 30 days after EPA's notification, seek dispute resolution under Paragraph 25.

b. The SOW and/or related work plans shall be modified: (1) in accordance with the modification issued by EPA; or (2) if the City invokes dispute

resolution, in accordance with the final resolution of the dispute. The modification shall be incorporated into and enforceable under this CD, and the City shall implement all work required by such modification. The City shall incorporate the modification into the deliverable required under the SOW, as appropriate.

c. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions as otherwise provided in this CD.

16. **Property Requirements**

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

b. **Access, Appropriate Care, and Non-Interference.** Commencing on the date of transfer from Dico to the City, the City shall: (i) provide EPA and its representatives, including contractors and subcontractors, with full cooperation, assistance, and access to the Dico Property at all reasonable times and to any other persons that are authorized to conduct response actions or natural resource assessment or restoration at the Dico Property, including those activities listed in Paragraph 16.b(1) (Access Requirements); (ii) exercise appropriate care with respect to hazardous substances found at the Dico Property as described in Paragraph 16.b(2) (Appropriate Care), and (iii) 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 removal action, including the restrictions listed in Paragraph 16.b(3) (Land, Water, or Other Resource Use Restrictions)].

(1) **Access Requirements.** The following is a list of activities for which access is required regarding the Dico Property

- (a) Conducting investigations regarding contamination at or near the Site;
- (b) Obtaining samples;
- (c) Assessing the need for, planning, implementing, or monitoring response actions;
- (d) Assessing implementation of quality assurance and quality control practices as defined in any approved quality assurance quality control plan;
- (e) Inspecting and copying records, operating logs, contracts, or other documents maintained or

generated by the City or its agents consistent with Paragraph 17 (Access to Information);

- (f) Assessing the City's compliance with the Consent Decree;
- (g) Determining whether the Dico Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Consent Decree;
- (h) Implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions regarding the Dico Property.

(2) **Appropriate Care.** The City shall take reasonable steps to

- (a) Stop any continuing releases;
- (b) Prevent any threatened future releases; and
- (c) Prevent or limit human, environmental or natural resource exposure to any previously released hazardous substance.

(3) **Land, Water, or Other Resource Use Restrictions.** The City shall (i) remain in compliance with any land use restrictions established in connection with any response action at the Dico Property, (ii) implement, maintain, monitor, and report on Institutional Controls, and (iii) not impede the effectiveness or integrity of any Institutional Control employed at the Dico Property in connection with a response action without prior approval of EPA. The following is a summary of land, water, or other resource use restrictions applicable to the Dico Property, which are set forth in greater detail in Appendix C (Form of Environmental Covenant), ¶ 8 (Activity and Use Limitations):

- (a) Limiting use of the Dico Property to non-residential purposes and multi-family residential purposes such as apartments or condominiums.

Without prior approval from EPA, the Dico Property shall not be used for first-floor residential occupancy, such as single-family homes or duplexes, or daycare facilities, elder care facilities, nursing homes, or hospitals.

- (b) Prohibiting the following activities which could result in exposure to contaminants in subsurface soils and groundwater:
 - 1) breaching the asphalt cap without prior approval from EPA; or
 - 2) excavation of soils underneath the asphalt cap without prior approval from EPA;
- (c) Restricting use of contaminated groundwater without prior approval from EPA;
- (d) Ensuring groundwater monitoring and extraction wells and associated piping, pumps, structures, and appurtenances are protected against damage, interference, or removal unless otherwise directed or approved by EPA.
- (e) Ensuring that any new structures on the Dico Property will be constructed with vapor barriers or vapor mitigation systems to minimize potential risk of inhalation of contaminants.

c. **Proprietary Controls.** The City shall, not later than fifteen (15) days after the Effective Date, submit for EPA approval a proposed Environmental Covenant substantially in the form attached as Appendix C to this Consent Decree to be filed with the Recorder's Office, Polk County, State of Iowa, that imposes as Proprietary Controls the land, water, and other resource use restrictions on the Dico Property identified in Paragraph

16.b(3). The City shall record the Covenant within ten (10) days after EPA's approval and submit to EPA, within ten (10) days thereafter, a certified copy of the recorded Covenant. The City shall not Transfer the Dico Property unless it has executed and recorded all Proprietary Controls regarding the Dico Property set forth in this Paragraph.

d. **Notice to Successors-in-Title.** The City shall, not later than fifteen (15) days after the Effective Date, submit for EPA approval a notice to be filed with the Recorder's Office, Polk County, State of Iowa. The notice must: (1) include a proper legal description of the Dico Property; (2) provide notice to all successors-in-title that: (i) the Dico Property is part of, or related to, the Des Moines TCE Site; (ii) EPA has selected remedies for Operable Units OU-1 through OU-4; and (iii) that the City has entered a Consent Decree requiring performance of Work necessary for operation and maintenance of those remedies; and (3) identify the United States District Court in which the Consent Decree was filed, the name and civil action number of the case, and the date the Consent Decree was entered by the Court. The City shall record the notice within ten (10) days after EPA's approval of the notice and submit to EPA, within ten (10) days thereafter, a certified copy of the recorded notice.

e. For so long as the City is an owner or operator of the Dico Property, the City shall require that assignees, successors in interest, and any lessees, sublessees and other parties with rights to use the Dico Property shall provide access and cooperation to EPA, its authorized officers, employees, representatives, and all other persons performing response actions under EPA oversight. The City shall require that assignees, successors in interest, and any lessees, sublessees, and other parties with rights to use the Dico Property implement and comply with any land use restrictions and Institutional Controls on the Dico Property in connection with any removal action, and not contest EPA's authority to enforce any land use restrictions and Institutional Controls on the Dico Property. The City shall provide a copy of this Consent Decree to any current lessees, sublessee, and other party with rights to use the Dico Property as of the date the City acquires the Dico Property.

f. Notwithstanding any provision of this Consent Decree, EPA retains all of its access authorities and rights, as well as all of its rights to require land, water or other resource use restrictions and ICs, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

17. **Access to Information**

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

b. The City shall provide to EPA, 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 "City Records") within the City's possession or control or that of their contractors or agents relating to activities at the Dico Property or to the implementation of this Consent Decree, 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. The City shall also make available to EPA, for purposes of investigation, information gathering, or

testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of any work related to response actions that may be taken on the Dico Property.

c. Privileged and Protected Claims

(1) The City may assert all or part of a City Record requested by EPA is privileged or protected as provided under federal law, in lieu of providing the City Record, provided the City complies with Paragraph 17.c(2) and except as provided in Paragraph 17.c(3).

(2) If the City asserts such a privilege or protection, it shall provide EPA with the following information regarding such City 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 description of the City Record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a City Record, the City shall provide the City Record to EPA in redacted form to mask the privileged or protected portion only. The City shall retain all City Records that it claims to be privileged or protected until EPA has had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in the City's favor.

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

d. Business Confidential Claims. The City may assert that all or part of a City Record provided to EPA under this Paragraph or Paragraph 18 (City 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). The City shall segregate and clearly identify all City Records or parts thereof submitted under this Settlement for which the City asserts business confidentiality claims. City Records that the City 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 City Records when they are submitted to EPA, or if EPA has notified the City that the City 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 City Records without further notice to the City.

e. Notwithstanding any provision of this Consent Decree, the United States retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

18. **Emergency Response/Release Reporting.** In the event the City becomes aware of any action or occurrence which causes or threatens a release of Waste Materials at or from the Dico Property that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, the City shall immediately take all appropriate action to prevent, abate, or minimize such release or threat of release, and shall, in addition to complying with any applicable notification requirements under Section 103 of CERCLA, 42 U.S.C. §9603, or any other law, immediately notify EPA of such release or threatened release. In the event that the City fails to take appropriate response action as required by this Paragraph, and EPA takes such instead, the City shall reimburse EPA for all costs of such response action not inconsistent with the NCP within 30 days of EPA's demand for such costs in the manner provided in Paragraph 23.c and d. The requirements of this Paragraph, other than the requirement to notify EPA contained in the first sentence hereof, do not apply to the response actions to be performed by EPA pursuant to Section IX (Response Actions by EPA) of this Consent Decree.

19. **City Record Retention.** The City agrees to retain and make available to EPA all business and operating records, contracts, Des Moines TCE Site studies and investigations, and documents relating to operations at the Dico Property, for at least ten years following the Effective Date unless otherwise agreed to in writing by EPA. At the end of ten years, the City shall notify EPA of the location of such documents and shall provide EPA with an opportunity to copy any documents at the expense of EPA.

20. **Compliance with Other Laws.**

a. Nothing in this Consent Decree limits the City's obligations to comply with the requirements of all applicable state and federal laws and regulations, except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), 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 Consent Decree 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.

b. 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, the City shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals. The City may seek relief under the provisions of Paragraph 24 (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 they have submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals. This Consent Decree is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

21. **Work Takeover**

a. In the event EPA determines that the City: (1) has ceased implementation of any portion of the Work; (2) are seriously or repeatedly deficient or late in their performance of the Work; or (3) are implementing the Work in a manner that may cause an endangerment to human health or the environment, EPA may issue a written notice (“Work Takeover Notice”) to the City. Any Work Takeover Notice issued by EPA will specify the grounds upon which such notice was issued and will provide the City a period of ten (10) days within which to remedy the circumstances giving rise to EPA’s issuance of such notice. EPA may provide the City a period of up to thirty (30) days within which to remedy the circumstances giving rise to EPA’s issuance of the work takeover notice if EPA determines, in its unreviewable discretion, that there is no endangerment.

b. If, after expiration of the notice period specified in ¶ 21.a, the City 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 the City in writing (which writing may be electronic) if EPA determines that implementation of a Work Takeover is warranted under this ¶ 21.b.

c. The City may invoke the procedures set forth in ¶ 25.d (Record Review), to dispute EPA’s implementation of a Work Takeover under ¶ 21.b. However, notwithstanding the City’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 ¶ 21.b until the earlier of (1) the date that the City 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 final decision is rendered in accordance with ¶ 25.d (Record Review) requiring EPA to terminate such Work Takeover.

22. Notwithstanding any other provision of this CD, the United States retains all authority and reserves all rights to take any and all response actions authorized by law.

23. Failure of the City to Comply with Consent Decree.

a. If the City does not comply with Sections VI (Transfer of Dico Property) or VIII (Obligations of the City of Des Moines), the City shall be in violation of this Consent Decree and shall pay to EPA, as a stipulated penalty, \$500 per violation per day of such noncompliance; Provided, however, that if EPA disapproves all or a portion of any Deliverable pursuant to ¶ 7.3(b) of the SOW, any stipulated penalties applicable to the original submission, as provided in this Paragraph, shall accrue during the period set forth in the notice of disapproval for the City to correct the deficiency, but shall not be payable unless the resubmission is untimely or is disapproved in whole or in part; provided further that, if the original submission was so deficient as to constitute a material breach of the City’s obligations under this Decree, the stipulated penalties applicable to the original submission shall be due and payable notwithstanding any subsequent resubmission.

b. In the event that EPA assumes performance of a portion or all of the Work pursuant to ¶ 21 (Work Takeover), the City shall be liable for a stipulated penalty in the amount of \$250,000. Stipulated penalties under this Paragraph are in addition to the remedies available under ¶ 21 (Work Takeover). If the City invokes Dispute Resolution under Paragraph 25 (Dispute Resolution) with respect to stipulated penalties assessed under

this Paragraph 23.b, it shall be liable for such penalties only if the result of Dispute Resolution is to uphold EPA's decision to assume performance of all or a portion of the Work.

c. Stipulated penalties are due and payable within 30 days after the date of the demand for payment of the penalties by EPA. All payments to EPA shall include a reference to the Site/Spill ID Number 0725 and DJ Number 90-11-3-09925, and shall be made by Fedwire EFT to:

Federal Reserve Bank of New York
ABA = 021030004
Account = 68010727
SWIFT address = FRNYUS33
Field Tag 4200 of the Fedwire message should read
"D 68010727 Environmental Protection Agency"

d. **Notice of Payment.** For each payment made under this Paragraph, the City shall send notices, including references to the CDCS, Site/Spill ID, and DJ numbers, to the United States, EPA, and the EPA Cincinnati Finance Center, all in accordance with ¶ 68.

e. If the United States brings an action to enforce this Consent Decree against the City, the City shall reimburse the United States for all costs of such action, including but not limited to costs of attorney time.

f. Penalties shall continue to accrue as provided in ¶ 23.a during any dispute resolution period, but need not be paid until the following:

(1) If the dispute is resolved by agreement of the parties or by a decision of EPA that is not appealed to this Court, accrued penalties determined to be owed shall be paid to EPA within 15 days after the agreement or the receipt of EPA's decision or order;

(2) If the dispute is appealed to this Court and the United States prevails in whole or in part, the City shall pay all accrued penalties determined by the Court to be owed to EPA within 60 days after receipt of the Court's decision or order, except as provided in ¶ 23.f(3);

(3) If the District Court's decision is appealed by any Party, the City shall pay all accrued penalties determined by the District Court to be owed to the United States into an interest-bearing escrow account, established at a duly chartered bank or trust company that is insured by the FDIC, within 60 days after receipt of the Court's decision or order. Penalties shall be paid into this account as they continue to accrue, at least every 60 days. Within 15 days after receipt of the final appellate court decision, the escrow agent shall pay the balance of the account to EPA or to the City to the extent that it prevails.

(4) If the City fails to pay stipulated penalties when due, the City shall pay Interest on the unpaid stipulated penalties as follows: (a) if the City 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 ¶ 23.f until the date of payment; and (b) if the City fails to timely invoke dispute resolution, Interest shall accrue from the date of demand under ¶ 23.c until the date of payment. If the City fails to pay stipulated penalties and Interest when due, the United States may institute proceedings to collect the penalties and Interest.

g. Payments made under this Paragraph shall be in addition to any other remedies or sanctions available to Plaintiff by virtue of the City's failure to comply with the requirements of this Consent Decree.

h. Notwithstanding any other provision of this Paragraph, the United States may, in its unreviewable discretion, waive payment of any portion of the stipulated penalties that have accrued pursuant to this Consent Decree. Payment of stipulated penalties shall not excuse the City from performance of any other requirements of this Consent Decree.

24. Force Majeure

a. "Force majeure," for purposes of this CD, is defined as any event arising from causes beyond the control of the City, of any entity controlled by the City, or of the City's contractors that delays or prevents the performance of any obligation under this CD despite the City's best efforts to fulfill the obligation. The requirement that the City 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 or a failure to achieve the Performance Standards.

b. If any event occurs or has occurred that may delay the performance of any obligation under this CD for which the City intends or may intend to assert a claim of force majeure, the City shall notify EPA's Project Coordinator orally or, in his or her absence, EPA's Alternate Project Coordinator or, in the event both of EPA's designated representatives are unavailable, the Director of the Superfund and Emergency Management Division, EPA Region 7, within 72 hours of when the City first knew that the event might cause a delay. Within 5 days thereafter, the City shall provide in writing to EPA 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; the City's rationale for attributing such delay to a force majeure; and a statement as to whether, in the opinion of the City, such event may cause or contribute to an endangerment to public health or welfare, or the environment. The City shall include with any notice all available documentation supporting their claim that the delay was attributable

to a force majeure. The City shall be deemed to know of any circumstance of which the City, any entity controlled by the City, or the City's contractors or subcontractors knew or should have known. Failure to comply with the above requirements regarding an event shall preclude the City from asserting any claim of force majeure regarding that event, provided, however, that if EPA, despite the late or incomplete notice, is able to assess to its satisfaction whether the event is a force majeure under ¶ 24.a and whether the City has exercised its best efforts under ¶ 24.a, EPA may, in its unreviewable discretion, excuse in writing the City's failure to submit timely or complete notices under this Paragraph.

c. If EPA agrees that the delay or anticipated delay is attributable to a force majeure, the time for performance of the obligations under this CD 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 the City in writing of its decision. If EPA agrees that the delay is attributable to a force majeure, EPA will notify the City in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure.

d. If the City elects to invoke the dispute resolution procedures set forth in Paragraph 25 (Dispute Resolution) regarding EPA's decision, it shall do so no later than 15 days after receipt of EPA's notice. In any such proceeding, the City 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 the City complied with the requirements of ¶ 24. If the City carries this burden, the delay at issue shall be deemed not to be a violation by the City of the affected obligation of this CD identified to EPA and the Court.

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

25. Dispute Resolution.

a. Unless otherwise expressly provided for in this CD, the dispute resolution procedures of this Paragraph shall be the exclusive mechanism to resolve disputes between the City and the United States under this CD. However, the procedures set forth in this Section shall not apply to actions by the United States to enforce obligations of the City that have not been disputed in accordance with this Paragraph.

b. A dispute shall be considered to have arisen when one party sends the other party a written Notice of Dispute. Any dispute regarding this CD shall in the first instance be the subject of informal negotiations between the City and the United States. The period for informal negotiations shall not exceed 20 days from the time the dispute arises, unless it is modified by written agreement of the parties to the dispute.

c. Statements of Position.

(1) In the event that the parties cannot resolve a dispute by informal negotiations under the preceding Subparagraph, then the position advanced by EPA shall be considered binding unless, within 30 days after the conclusion of the informal negotiation period, the City invokes the formal dispute resolution procedures of this Paragraph by serving on the United States a written Statement of Position on the matter in dispute, including, but not limited to, any factual data, analysis, or opinion supporting that position and any supporting documentation relied upon by the City. The Statement of Position shall specify the City's position as to whether formal dispute resolution should proceed under ¶ 25.d (Record Review) or 25.e.

(2) Within 60 days after receipt of the City's Statement of Position, EPA will serve on the City its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by EPA. EPA's Statement of Position shall include a statement as to whether formal dispute resolution should proceed under ¶ 25.d (Record Review) or 25.e. Within 30 days after receipt of EPA's Statement of Position, the City may submit a Reply.

(3) If there is disagreement between EPA and the City as to whether dispute resolution should proceed under ¶ 25.d (Record Review) or 25.e, the parties to the dispute shall follow the procedures set forth in the Paragraph determined by EPA to be applicable. However, if the City ultimately appeals to the Court to resolve the dispute, the Court shall determine which Paragraph is applicable in accordance with the standards of applicability set forth in ¶¶ 25.d and 25.e.

d. **Record Review.** Formal dispute resolution for disputes pertaining to the selection or adequacy of any response action and all other disputes that are accorded review on the administrative record under applicable principles of administrative law shall be conducted pursuant to the procedures set forth in this Paragraph. For purposes of this Paragraph, the adequacy of any response action includes, without limitation, the adequacy or appropriateness of plans, procedures to implement plans, or any other items requiring approval by EPA under this CD, and the adequacy of the performance of response actions taken pursuant to this CD. The City shall not challenge, using the dispute resolution procedures under this Paragraph, or judicially, EPA's remedial action selection embodied in the ROD.

(1) An administrative record of the dispute shall be maintained by EPA and shall contain all statements of position, including supporting documentation, submitted pursuant to this Paragraph. Where appropriate, EPA may allow submission of supplemental statements of position by the parties to the dispute.

(2) The Director of the Superfund and Emergency Management Division, EPA Region VII, will issue a final administrative decision resolving the dispute based on the administrative record described in

¶ 25.d(1). This decision shall be binding upon the City, subject only to the right to seek judicial review pursuant to ¶¶ 25.d(3) and 25.d(4).

(3) Any administrative decision made by EPA pursuant to ¶ 25.d(2) shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by the City with the Court and served on all Parties within 10 days after receipt of EPA's decision. The motion shall include a description of the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this CD. The United States may file a response to the City's motion.

(4) In proceedings on any dispute governed by this Subparagraph (Record Review), the City shall have the burden of demonstrating that the decision of the Superfund and Emergency Management Division Director is arbitrary and capricious or otherwise not in accordance with law. Judicial review of EPA's decision shall be on the administrative record compiled pursuant to ¶ 25.d(1).

e. Formal dispute resolution for disputes that neither pertain to the selection or adequacy of any response action nor are otherwise accorded review on the administrative record under applicable principles of administrative law, shall be governed by this Subparagraph.

(1) The Director of the Superfund and Emergency Management Division, EPA Region VII, will issue a final decision resolving the dispute based on the statements of position and reply, if any, served under ¶ 25.c. The Superfund and Emergency Management Division Director's decision shall be binding on the City unless, within 10 days after receipt of the decision, the City files with the Court and serves on the parties a motion for judicial review of the decision setting forth the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of the CD. The United States may file a response to the City's motion.

(2) Notwithstanding ¶ J (CERCLA § 113(j) record review of ROD and Work) of Section I (Background), judicial review of any dispute governed by this Paragraph shall be governed by applicable principles of law.

f. The invocation of formal dispute resolution procedures under this Section does not extend, postpone, or affect in any way any obligation of the City under this CD, except as agreed by EPA or as determined by the Court. Stipulated penalties with respect to the disputed matter shall continue to accrue, but payment shall be stayed pending resolution of the dispute, as provided in ¶ 23.f. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this CD. In the event that the City does not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Paragraph 23 (Stipulated Penalties).

26. Transfer of Dico Property by the City.

a. Notwithstanding any other provisions of this Consent Decree 1) in the event of any Transfer of the Property, unless EPA otherwise consents in writing, the City shall continue to comply with its obligations under this Consent Decree and 2) none of the rights, benefits or obligations conferred upon the City under this Consent Decree may be assigned or transferred to any person without the prior written consent of EPA in its sole discretion.

b. In the event of a Transfer by the City of all or any portion of the Dico Property, all proceeds from such Transfer transaction(s) shall be deposited first into an interest-bearing escrow account or the Court registry, and then divided and paid in the following order:

(1) First, EPA shall receive an amount equal to its Reimbursable Response Costs; and then

(2) Second, the City shall receive an amount equal to its costs in performing the Work; and then

(3) Third, EPA and the City shall each receive fifty (50) percent of any further or remaining proceeds.

c. Funds, with accrued interest, if any, shall be paid to EPA within 60 days of closing on the relevant transaction as set forth in Paragraphs 26.b(1) and (2).

d. Funds received by EPA pursuant to this Paragraph shall be deposited by EPA in the Des Moines TCE Special Account to be retained and used to conduct or finance response actions at or in connection with the Des Moines TCE Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

IX. RESPONSE ACTIONS BY EPA

27. After the Effective Date, EPA will perform, or will already have commenced performance of, the following response actions at the Dico Property using either funds from the Superfund or from the Des Moines TCE Special Account:

a. The time-critical removal action regarding the South Pond as set forth in the applicable Action Memorandum, issued by EPA in substantially similar form to the draft Action Memorandum attached as Appendix E.

b. The non-time-critical removal action regarding buildings 1, 2, and 3 as set forth in the applicable Action Memorandum, to be issued by EPA after the Effective Date in substantially similar form to the draft Action Memorandum attached as Appendix F.

c. The replacement/upgrade of the groundwater treatment system as described in the June 2020 Remedial System Optimization Memorandum attached as Appendix G.

28. EPA shall coordinate the implementation of response actions under this Section IX (Response Actions by EPA) with the City to maximize efficient implementation

of response actions and other engineering, demolition, and construction work at the Dico Property.

X. FAILURE OF SETTling DEFENDANTS TO COMPLY WITH CONSENT DECREE

29. **Interest on Late Payments.** If any Settling Defendant fails to make any payment under Paragraph 4 (Payment of Judgments) by the required due date, Interest shall continue to accrue on the unpaid balance through the date of payment.

30. **Stipulated Penalties.**

a. If any amounts due to EPA under Paragraph 4 (Payment of Judgments) are not paid by the required date, Settling Defendants shall be in violation of this Consent Decree and shall pay to EPA, as a stipulated penalty, in addition to the Interest required by Paragraph 29, \$2,000 per violation per day that such payment is late.

b. If Settling Defendants do not comply with Sections VI (Transfer of Dico Property) or VII (Additional Obligations of Settling Defendants), Settling Defendants shall be in violation of this Consent Decree and shall pay to EPA, as a stipulated penalty, \$5,000 per violation per day of such noncompliance.

c. Stipulated penalties are due and payable within 30 days after the date of the demand for payment of the penalties by EPA. All payments to EPA under this Paragraph shall include a reference to the Site/Spill ID Number 0725 and DJ Number 90-11-3-09925 and shall be made by Fedwire EFT to:

Federal Reserve Bank of New York
ABA = 021030004
Account = 68010727
SWIFT address = FRNYUS33
33 Liberty Street
New York NY 10045
Field Tag 4200 of the Fedwire message should read
“D 68010727 Environmental Protection Agency”

d. **Notice of Payment.** For each payment made under this Paragraph, the SDs shall send notices, including references to the CDCS, Site/Spill ID, and DJ numbers, to the United States, EPA, and the EPA Cincinnati Finance Center, all in accordance with ¶ 68.

31. If the United States brings an action to enforce this Consent Decree against Settling Defendants, Settling Defendants shall reimburse the United States for all costs of such action, including but not limited to costs of attorney time.

32. Payments made under this Section shall be in addition to any other remedies or sanctions available to Plaintiff by virtue of Settling Defendants' failure to comply with the requirements of this Consent Decree.

33. The obligations of Settling Defendants to pay amounts owed the United States under this Consent Decree are joint and several. In the event of the insolvency of any Settling Defendant or the failure by any Settling Defendant to make the payments required under this Consent Decree, the remaining Settling Defendants shall be responsible for such payments.

34. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive payment of any portion of the stipulated penalties that have accrued pursuant to this Consent Decree. Payment of stipulated penalties shall not excuse Settling Defendants from payment as required by Section V (Payment of Response Costs) or from performance of any other requirements of this Consent Decree.

XI. COVENANTS BY PLAINTIFF

35. **Covenants for Settling Defendants by United States.** Except as specifically provided in Section XII (Reservation of Rights by United States), the United States covenants not to sue or to take administrative action against Settling Defendants pursuant to Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606, 9607 relating to the Sites. These covenants shall take effect upon the Effective Date. These covenants are conditioned upon the satisfactory performance by Settling Defendants of their obligations under this Consent Decree. These covenants extend only to Settling Defendants and do not extend to any other person.

36. **Satisfaction of Judgments.** Within 60 days after receipt of the Settling Defendants' initial payment required by Paragraph 4.a, the United States will release its liens and/or abstracts of judgment on the Dico Property and file Satisfactions of Judgment for all judgments in this case and in Case No. 4-95-cv-10289.

37. **Covenants for the City by United States.** Except as specifically provided in Section XII (Reservations of Rights by United States) and in Paragraph 26 (Transfer of Dico Property by the City), the United States covenants not to sue or to take administrative action against the City pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), for Existing Contamination, the Work, and Future Response Costs. These covenants shall take effect upon the Effective Date. These covenants are conditioned upon the satisfactory performance by the City of its obligations under this Consent Decree. These covenants are also conditioned upon the veracity of the information provided to EPA by the City relating to the City's involvement with the Dico Property and the certification made by the City in Paragraph 11. These covenants extend only to the City and do not extend to any other person. Nothing in this Consent Decree constitutes a covenant not to sue or to take action or otherwise limits the ability of the United States, including EPA, to seek or obtain further relief from the City, if the information provided to EPA by the City relating to the City's involvement with the Dico Property, or the certification made by the City in Paragraph 11, is false or in any material respect, inaccurate.

38. Except as expressly provided in this Section XI (Covenants by Plaintiff), nothing in this Consent Decree constitutes a satisfaction of or release from any claim or cause of action against the City or Defendants or any person not a party to this Consent Decree, 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 for costs, damages, and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

XII. RESERVATIONS OF RIGHTS BY UNITED STATES

39. United States' New Information/New Conditions Reservations.

Notwithstanding any other provision of this CD, the United States reserves, and this CD is without prejudice to, the right to institute proceedings in this action or in a new action, and/or to issue an administrative order, seeking to compel Defendant Dico to perform further response actions relating to the Des Moines TCE Site, or to compel Defendants Dico and Titan Tire to perform further response actions relating to the SIM Site, and/or to pay the United States for additional costs of response if (1) conditions at the Site, previously unknown to EPA, are discovered, or (2) information, previously unknown to EPA, is received, in whole or in part, and (b) EPA determines that these previously unknown conditions or information together with any other relevant information indicates that the selected response action is not protective of human health or the environment.

40. For purposes of ¶ 39 (United States' New Information/New Conditions Reservations), the information and the conditions known to EPA shall include only that information and those conditions known to EPA as of the date EPA certifies or certified completion of the response action and set forth in the ROD or other decision document, the administrative record supporting the ROD or decision document, or in the post-ROD or post-decision document administrative record.

41. **General Reservations with Respect to SDs.** The United States reserves, and this Consent Decree is without prejudice to, all rights against Settling Defendants with respect to all matters not expressly included within Paragraph 35 (Covenants for Settling Defendants by United States) and Paragraph 36 (Satisfaction of Judgments). Notwithstanding any other provision of this Consent Decree, the United States reserves all rights against Settling Defendants with respect to:

- a. liability for failure of Settling Defendants to meet a requirement of this Consent Decree;
- b. liability arising from the past, present, or future disposal, release, or threat of release of Waste Material outside of the Sites;
- c. liability based on the ownership of the Sites by Settling Defendants when such ownership commences after signature of this CD by Settling Defendants;
- d. liability based on the operation of the Sites by Settling Defendants when such operation commences after signature of this CD by Settling Defendants and does not arise solely from Settling Defendants' performance of response actions required by EPA;
- e. liability based on Settling Defendants' transportation, treatment, storage, or disposal, or arrangement for transportation, treatment, storage, or disposal of Waste Material at or in connection with the Sites, other than as provided in a ROD or other

decision document, or otherwise ordered by EPA, after signature of this CD by Settling Defendants;

f. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

g. criminal liability;

42. **General Reservations with Respect to the City.** The United States reserves, and this Consent Decree is without prejudice to, all rights against the City with respect to all matters not expressly included within Paragraph 37 (Covenants for the City by United States). Notwithstanding any other provision of this Consent Decree, the United States reserves all rights against the City with respect to:

a. claims based on a failure by the City to meet a requirement of this Consent Decree;

b. criminal liability;

c. liability for violations of federal, state, or local law or regulations 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;

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

f. liability resulting from exacerbation of Existing Contamination by the City, its successors, assigns, lessees, or sublessees; and

g. liability arising from the disposal, release or threat of release of Waste Materials outside of the Dico Property.

XIII. COVENANTS BY SETTLING DEFENDANTS

43. **Covenants for Plaintiff by Settling Defendants.** Settling Defendants covenant not to sue and agree not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Sites and this Consent Decree, including but not limited to:

a. any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund based on 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 claims under CERCLA §§ 107 or 113, RCRA Section 7002(a), 42 U.S.C. § 6972(a), or state law regarding the Sites and this CD; or

c. any claims arising out of response actions at or in connection with the Sites, including any claim under the United States Constitution, the Iowa Constitution, the

Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, or at common law.

44. **Covenants for the City by Settling Defendants.** Settling Defendants covenant not to sue and agree not to assert any claims or causes of action against the City, or its contractors or employees, with respect to the Des Moines TCE Site or the Dico Property and this Consent Decree under CERCLA §§ 107 or 113, RCRA Section 7002(a), 42 U.S.C. § 6972(a), or analogous state law.

45. **Covenants by Settling Defendants Regarding Section 106(b) Petitions.** No later than 30 days after the Effective Date, Defendants Dico and Titan Tire shall withdraw their CERCLA Section 106(b) petitions with respect to the SIM Site currently pending before the Environmental Appeals Board of EPA. Settling Defendants agree not to reinstate such petitions.

46. **Waiver of Claims by Settling Defendants**

a. Settling Defendants agree not to assert any claims and to waive all claims or causes of action (including but not limited to claims or causes of action under Sections 107(a) and 113 of CERCLA) that they may have:

(1) **De Micromis Waiver.** For all matters relating to the Sites against any person where the person's liability to Settling Defendants with respect to the Site is based solely on having arranged for disposal or treatment, or for transport for disposal or treatment, of hazardous substances at the Site, or having accepted for transport for disposal or treatment of hazardous substances at the Site, if all or part of the disposal, treatment, or transport occurred before April 1, 2001, and the total amount of material containing hazardous substances contributed by such person to the Site was less than 110 gallons of liquid materials or 200 pounds of solid materials;

(2) **Waiver Regarding Southern Iowa Mechanical.** For all matters relating to the Sites against Southern Iowa Mechanical, LLC and its president, Jim Hughes, (collectively, "SIM") arising from SIM's arrangement or transport for disposal, or disposal, of hazardous substances at or from the Sites or from any contractual relationship with any Settling Defendant related to such activities.

b. **Exceptions to Waiver**

(1) The waivers under this Paragraph 46 shall not apply with respect to any defense, claim, or cause of action that a Settling Defendant may have against any person otherwise covered by such waiver if such person asserts a claim or cause of action relating to the Sites against such Settling Defendant.

XIV. COVENANTS BY THE CITY OF DES MOINES

47. **Covenants for Plaintiff by the City.** The City covenants not to sue and agrees not to assert any claims or causes of action against the United States, or its

contractors or employees, with respect to Existing Contamination, the Work, Future Response Costs and this Consent Decree, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. § 9507, based on 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 Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, 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, Future Response Costs, and this Consent Decree.

48. Nothing in this Consent Decree 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).

49. The covenants not to sue set forth in Paragraph 47 shall not apply in the event the United States brings a cause of action or issues an order pursuant to any of the reservations set forth in Paragraph 42 (General Reservations with Respect to the City), other than in Paragraph 42.a (liability for failure to meet a requirement of the Settlement), 42.b (criminal liability), or 42.c (violations of federal/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 is seeking pursuant to the applicable reservation.

50. **Covenants for Settling Defendants by the City.** The City covenants not to sue and agrees not to assert any claims or causes of action against the Settling Defendants, or their contractors or employees, with respect to the Des Moines TCE Site and the Dico Property and this Consent Decree under CERCLA §§ 107 or 113, RCRA Section 7002(a), 42 U.S.C. § 6972(a), or analogous state law.

51. **No Assumption of Liability by United States.**

a. The United States does not assume any liability by entering into this Settlement or by virtue of any designation of the City as EPA's authorized representative under Section 104(e) of CERCLA, 42 U.S.C. § 9604(e), and 40 C.F.R. 300.400(d)(3).

b. The United States shall not be held out as a party to any contract entered into by or on behalf of the City in carrying out activities pursuant to this Consent Decree. Neither the City nor any such contractor shall be considered an agent of the United States.

c. The City covenants not to sue and agrees not to assert any claims or causes of action against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between the City and any person for performance of

Work on or relating to the Dico Property, including, but not limited to, claims on account of construction delays. In addition, the City shall agree to pay on behalf of the United States any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between the City and any person for performance of Work on or relating to the Dico Property, including, but not limited to, claims on account of construction delays

52. **Reservation by City.** The City reserves, and this Consent Decree is without prejudice to, claims against the United States, 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, 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, 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 the City's deliverables or activities.

XV. EFFECT OF SETTLEMENT/CONTRIBUTION

53. Except as provided in Paragraph 46 (Waiver of Claims by Settling Defendants), nothing in this Consent Decree shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Consent Decree. Except as provided in Section XIII (Covenants by Settling Defendants), 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 it may have with respect to any matter, transaction, or occurrence relating in any way to the Sites against any person not a Party hereto. Nothing in this Consent Decree diminishes the right of the United States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-(3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

54. By this Consent Decree, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of the City. The United States or EPA shall not be deemed a party to any contract entered into by the City or its directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Consent Decree.

55. The Parties agree, and by entering this Consent Decree this Court finds, that this Consent Decree constitutes a judicially-approved settlement pursuant to which each Settling Defendant has, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(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" with respect to the SDs in this Consent Decree. The "matters

addressed” with respect to the SDs in this Consent Decree are all response actions taken or to be taken and all response costs incurred or to be incurred, at or in connection with the Sites, by the United States or any other person, except for the State; provided, however, that if the United States exercises rights under the reservations in Section XVI (Covenants by Plaintiff), other than in ¶¶ 41.a (claims for failure to meet a requirement of the CD), 41.g (criminal liability), or 42 (General Reservations with Respect to the City), the “matters addressed” with respect to the SDs in this CD will no longer include those response costs or response actions that are within the scope of the exercised reservation.

56. The Parties further agree, and by entering this Consent Decree this Court finds, that the complaint filed by the United States in this action, and the complaint filed by the United States in Case No. 4-95-cv-10289, are each a civil action within the meaning of Section 113(f)(1) of CERCLA, 42 U.S.C. § 9613(f)(1), and that this Consent Decree constitutes a judicially-approved settlement pursuant to which Settling Defendants have, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

57. The Parties agree, and by entering this Consent Decree this Court finds, that this Consent Decree constitutes a judicially-approved settlement pursuant to which the City has, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(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” with respect to the City in this Consent Decree. The “matters addressed” with respect to the City in this Consent Decree are all response actions taken or to be taken and all response costs incurred or to be incurred in connection with Existing Contamination, the Work, and Future Response Costs by the United States or by any other person, except the State; provided, however, that if the United States exercises rights under the reservations in Paragraph 42, other than in ¶¶ 42.a (claims for failure to meet a requirement of the CD), 42.b (criminal liability), or 42.c (violations of law during or after implementation of the Work), the “matters addressed” with respect to the City in this CD will no longer include those response costs or response actions that are within the scope of the exercised reservation. .

58. The parties further agree, and by entering this Consent Decree this Court finds, that this Consent Decree constitutes a judicially-approved settlement pursuant to which the City has, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

59. Each Settling Defendant and the City shall, with respect to any suit or claim brought by it for matters related to this Consent Decree, notify EPA and DOJ in writing no later than 60 days prior to the initiation of such suit or claim. Each Settling Defendant and the City also shall, with respect to any suit or claim brought against it for matters related to this Consent Decree, notify EPA and DOJ in writing within 10 days after service of the complaint or claim upon it. In addition, each Settling Defendant and the City shall notify EPA and DOJ within 10 days after service or receipt of any Motion for Summary Judgment, and within 10 days after receipt of any order from a court setting a case for trial, for matters related to this Consent Decree.

60. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, recovery of response costs, or other relief relating to the Sites, Settling Defendants shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant case; provided, however, that nothing in this Paragraph affects the enforceability of the Covenants by Plaintiff set forth in Section XI.

XVI. PROPERTY REQUIREMENTS FOR OWNER SETTLING DEFENDANT

61. **Agreements Regarding Access and Non-Interference.** Owner Settling Defendant shall, with respect to its Affected Property, until it completes the transfer of its Affected Property to the City as required by Section VI (Transfer of Dico Property):

a. Provide the United States, potentially responsible parties and/or the City, and their representatives, contractors, and subcontractors with access at all reasonable times to its Affected Property to conduct any activity relating to response actions at the Des Moines TCE Site including the following activities:

- (1) Verifying any data or information submitted to the United States;
- (2) Conducting investigations regarding contamination at or near the Des Moines TCE Site;
- (3) Obtaining samples;
- (4) Assessing the need for, planning, implementing, or monitoring response actions;
- (5) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Owner Settling Defendant or its agents, consistent with Section XVII (Access to Information);
- (6) Assessing Owner Settling Defendant compliance with the Consent Decree;
- (7) Determining whether the Affected Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted, under the Consent Decree; and
- (8) Implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions regarding the Affected Property.

b. Refrain from using its Affected Property in any manner that EPA determines will (i) pose an unacceptable risk to human health or to the environment due to exposure to hazardous substances or (ii) interfere with or adversely affect the implementation, integrity, or protectiveness of response actions at the Des Moines TCE Site.

c. Continue to carry out its obligations required by 1) Unilateral Administrative Order for Remedial Action, Docket No. 86-F0011 (July 21, 1986); 2) Unilateral Administrative Order for Removal Action, Docket No. VII-94-F-0017 (March 4, 1994); and 3) Unilateral Administrative Order for Removal Action, Docket No. VII-94-F-0009 (June 4, 1994).

62. If EPA determines in a decision document prepared in accordance with the NCP that institutional controls in addition to those already in place in the form of state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices are needed regarding the Affected Property, Owner Settling Defendant shall cooperate with EPA's efforts to secure and ensure compliance with such institutional controls. EPA shall notify the City shall prior to the application of any institutional controls developed pursuant to this Paragraph 62.

63. Notwithstanding any provision of the Consent Decree, the United States retains all of its access authorities and rights, as well as all of its rights to require institutional controls, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

XVII. ACCESS TO SETTLING DEFENDANT INFORMATION

64. Settling Defendants shall provide to EPA and/or the City, 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 "SD Records") within their possession or control or that of their contractors or agents (to the extent Settling Defendants have a right to obtain such records) relating to activities at the Sites or to the implementation of this Consent Decree, 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 Sites.

65. Privileged and Protected Claims

a. Settling Defendants may assert that all or part of a SD Record is privileged or protected as provided under federal law, provided they comply with Paragraph 65.b, and except as provided in Paragraph 65.c.

b. If Settling Defendants assert a claim of privilege or protection, they shall provide Plaintiff with the following information regarding such SD Record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, each addressee, and of each recipient; a description of the SD Record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a SD Record, Settling Defendants shall provide the SD Record to Plaintiff in redacted form to mask the privileged or protected information only. Settling Defendants shall retain all SD Records that they claim to be privileged or protected until the United States has had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in the Settling Defendants' favor.

c. Settling Defendants may make no claim of privilege or protection regarding:

(1) any data regarding the Sites, including but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological, or engineering data, or the portion of any other SD Record that evidences conditions at or around the Sites; or

(2) the portion of any SD Record that Settling Defendants are required to create or generate pursuant to this Consent Decree.

66. **Business Confidential Claims.** Settling Defendants may assert that all or part of a SD Record submitted to Plaintiff under this Section 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). Settling Defendants shall segregate and clearly identify all SD Records or parts thereof submitted under this Consent Decree for which Settling Defendants assert a business confidentiality claim. SD Records that Settling Defendants claim to be confidential business information will be accorded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies SD Records when they are submitted to EPA, or if EPA has notified Settling Defendants that the SD 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 SD Records without further notice to Settling Defendants.

67. Notwithstanding any provision of this Consent Decree, the United States retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

XVIII. NOTICES AND SUBMISSIONS

68. Whenever, under the terms of this Consent Decree, notice is required to be given or a document is required to be sent by one party to another, it shall be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other Parties in writing. Except as otherwise provided, notice to a Party by email (if that option is provided below) or by regular mail in accordance with this Section satisfies any notice requirement of the Consent Decree regarding such Party.

As to DOJ by email: eescdcopy.enrd@usdoj.gov
Re: DJ# 90-11-3-09925

As to DOJ by mail: EES Case Management Unit
U.S. Department of Justice
Environment and Natural Resources Division
P.O. Box 7611
Washington, D.C. 20044-7611
Re: DJ # 90-11-3-09925

As to EPA: Kristen Nazar
Office of Regional Counsel
U.S. EPA Region 7
11201 Renner Boulevard
Lenexa, KS 66219

At to EPA Cincinnati Finance Center: EPA Cincinnati Finance Center
26 W. Martin Luther King Drive
Cincinnati, Ohio 45268
cinwd_acctsreceivable@epa.gov

As to Settling Defendants: Michael G. Troyanovich
Titan International, Inc.
Corporate Secretary/General Counsel
2701 Spruce Street
Quincy, IL 62301

Stephen Locher
Belin McCormick
Attorneys at Law
666 Walnut Street, Suite 2000
Des Moines, Iowa 50309-3989
shlocher@belinmccormick.com

As to the City: City Manager
Office of the City Manager
City Hall
400 Robert D. Ray Dr.
Des Moines, IA 50309

City Attorney
Legal Department
City Hall
400 Robert D. Ray Dr.
Des Moines, IA 50309

XIX. MODIFICATION

69. Except as provided in ¶¶ 15 (Modification of SOW or Related Deliverables) and 70, material modifications to this CD, including the SOW, shall be in writing, signed by the United States and the Parties, and shall be effective upon approval by the Court. Except as provided in ¶ 15, non-material modifications to this CD, including the SOW, shall be in writing and shall be effective when signed by duly authorized representatives of the United States and the Parties. A modification to the SOW shall be considered material if it

implements a ROD amendment that fundamentally alters the basic features of the selected remedy within the meaning of 40 C.F.R. § 300.435(c)(2)(ii).

70. Any modification that does not affect the obligations of or the protections afforded to Settling Defendants may be executed without the signatures of Settling Defendants. Any modification that does not affect the obligations of or the protections afforded to the City may be executed without the signature of the City.

71. Nothing in this CD shall be deemed to alter the Court’s power to enforce, supervise, or approve modifications to this CD.

XX. RETENTION OF JURISDICTION

72. This Court shall retain jurisdiction over this matter for the purpose of interpreting and enforcing the terms of this Consent Decree.

XXI. INTEGRATION/APPENDICES

73. This Consent Decree and its appendices constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Consent Decree. The Parties acknowledge that there are no representations, agreements, or understandings relating to the settlement other than those expressly contained in this Consent Decree. The following appendices are attached to and incorporated into this Consent Decree:

- a. “Appendix A” – Maps of Sites
- b. “Appendix B” – Legal description of the Dico Property
- c. “Appendix C” – Form of Environmental Covenant
- d. “Appendix D” – Statement of Work (SOW)
- e. “Appendix E” – Draft Action Memorandum (OU4 – South Pond Area)
- f. “Appendix F” – Draft Action Memorandum (OU2 – Buildings 1-3)
- g. “Appendix G” – June 2020 Remedial System Optimization Memorandum

XXII. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

74. This Consent Decree shall be lodged with the Court for a period of at least 30 days for public notice and comment. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations that indicate that this Consent Decree is inappropriate, improper, or inadequate. Settling Defendants consent to the entry of this Consent Decree without further notice.

75. If for any reason this Court should decline to approve this Consent Decree in the form presented, this agreement is voidable at the sole discretion of any Party and the terms of the agreement may not be used as evidence in any litigation between the Parties.

XXIII. SIGNATORIES/SERVICE

76. Each undersigned representative of a Settling Defendant, the City, and the Assistant Attorney General, U.S. Department of Justice, Environment and Natural Resources Division, certifies that he or she is authorized to enter into the terms and conditions of this Consent Decree and to execute and bind legally such Party to this document.

77. Each Settling Defendant and the City agrees not to oppose entry of this Consent Decree by this Court or to challenge any provision of this Consent Decree, unless the United States has notified Settling Defendants and the City in writing that it no longer supports entry of the Consent Decree.

78. Each Settling Defendant shall identify, on the attached signature page, the name and address of an agent who is authorized to accept service of process by mail on behalf of that Party with respect to all matters arising under or relating to this Consent Decree. Settling Defendants hereby agree to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court, including but not limited to, service of a summons.

XXIV. FINAL JUDGMENT

79. Upon entry of this Consent Decree by the Court, this Consent Decree shall constitute the final judgment between and among the United States and the Settling Defendants and the City. The Court enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.

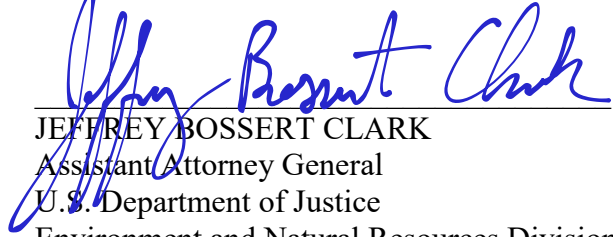
SO ORDERED THIS ___ DAY OF _____, 20__.

United States District Judge

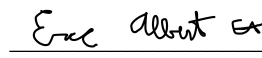
Signature Page for Consent Decree Regarding Des Moines TCE Superfund Site and
Southern Iowa Mechanical Site

FOR THE UNITED STATES OF AMERICA:

9/11/20
Dated



JEFFREY BOSSERT CLARK
Assistant Attorney General
U.S. Department of Justice
Environment and Natural Resources Division
Washington, D.C. 0530



Eric D. Albert
Trial Attorney
U.S. Department of Justice
Environment and Natural Resources Division
Environmental Enforcement Section
P.O. Box 7611
Washington, D.C. 20044-7611

Signature Page for Consent Decree Regarding Des Moines TCE Superfund Site and
Southern Iowa Mechanical Site

**JAMES
GULLIFORD** Digitally signed by JAMES
GULLIFORD
Date: 2020.09.01
14:59:33 -05'00'

James B. Gulliford
Regional Administrator
U.S. Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

**LESLIE
HUMPHREY** Digitally signed by
LESLIE HUMPHREY
Date: 2020.08.27
13:41:28 -05'00'

Leslie Humphrey
Regional Counsel
U.S. Environmental Protection Agency
Region 7
111201 Renner Boulevard
Lenexa, Kansas 66219

Signature Page for Consent Decree Regarding Des Moines TCE Superfund Site and Southern
Iowa Mechanical Site

FOR DICO, INC:

August 27, 2020

Dated



Name (print): Paul G. Reitz

Title: President

Address:

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name: Michael G. Troyanovich
Title: General Counsel and Corporate Secretary
Address: 1525 Kautz Road, Suite 600, West Chicago, IL 60185
Phone: (217) 221-4389
email: mike.troyanovich@titan-intl.com

Signature Page for Consent Decree Regarding Des Moines TCE Superfund Site and Southern
Iowa Mechanical Site

FOR TITAN TIRE CORPORATION:

August 27, 2020

Dated



Name (print): Paul G. Reitz

Title: President & CEO

Address:

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name: Michael G. Troyanovich

Title: General Counsel and Corporate Secretary

Address: 1525 Kautz Road, Ste 600, West Chicago, IL 60185

Phone: (217) 221-4389

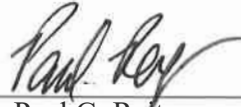
email: mike.troyanovich@titan-intl.com

Signature Page for Consent Decree Regarding Des Moines TCE Superfund Site and Southern
Iowa Mechanical Site

FOR TITAN INTERNATIONAL, INC.:

August 27, 2020

Dated



Name (print): Paul G. Reitz

Title: President & CEO

Address:

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name: Michael G. Troyanovich

Title: General Counsel and Corporate Secretary

Address: 1525 Kautz Road, Ste 600, West Chicago, IL 60185

Phone: (217) 221-4389

email: mike.troyanovich@titan-intl.com

Signature Page for Consent Decree Regarding Des Moines TCE Superfund Site and Southern
Iowa Mechanical Site

FOR THE CITY OF DES MOINES, IOWA:

September 14, 2020

Dated

Name (print): T.M. Franklin Cownie

Title: Mayor

Address: 400 Robert D. Ray Drive, Des Moines, Ia.

Agent Authorized to Accept Service on Behalf of Above-signed Party:

Name: Kay Cmelik

Title: City Clerk

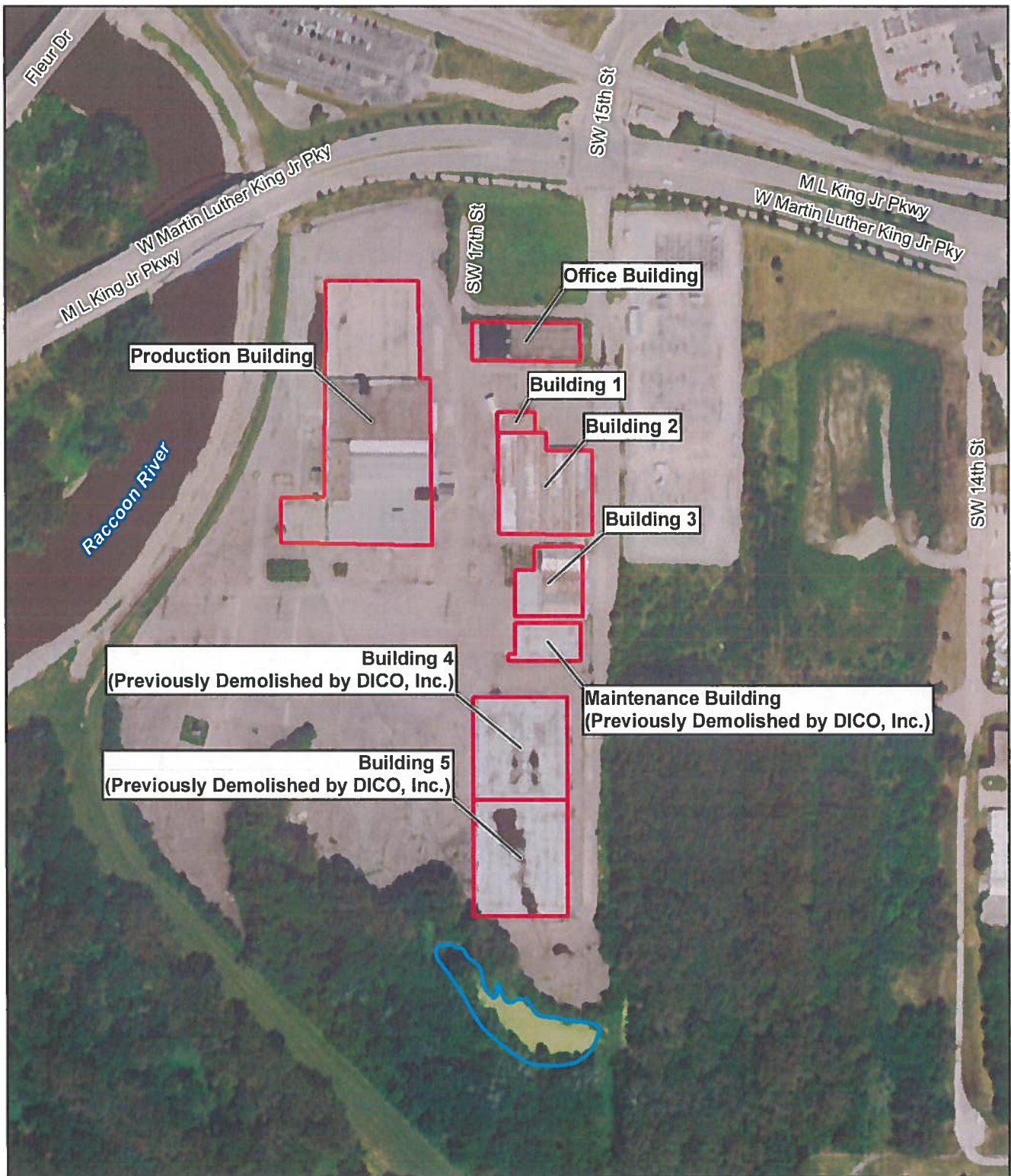
Address: 400 Robert D. Ray Drive

Des Moines, Ia.

Phone: (515) 237-1338

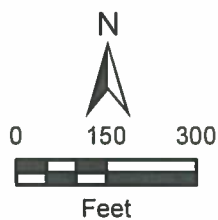
email: pkcmelik@dmgov.org

Appendix A



Legend

- Building location
- South pond area



Des Moines TCE Site
Des Moines, Iowa

Figure 2
Site Layout Map



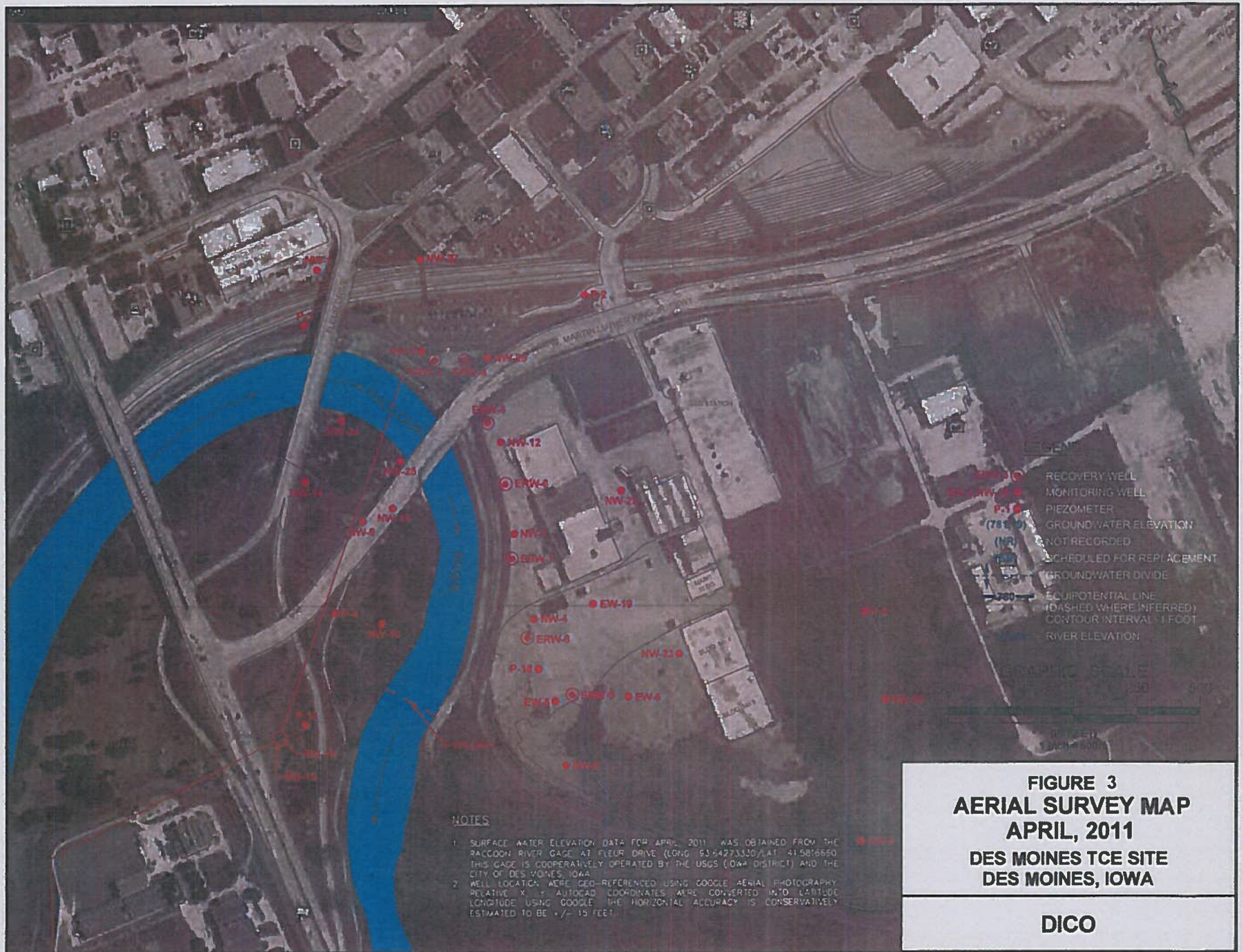
X:\08025014\0000\Projects\mxd\Figure2_072116.mxd

Source: ESRI, ArcGIS Online Maps, World Imagery, 2014; HSIP Gold, 2007

Date: 10/5/2016

Drawn By: Nick Wiederholt

Project No: X8025.16 0144.000



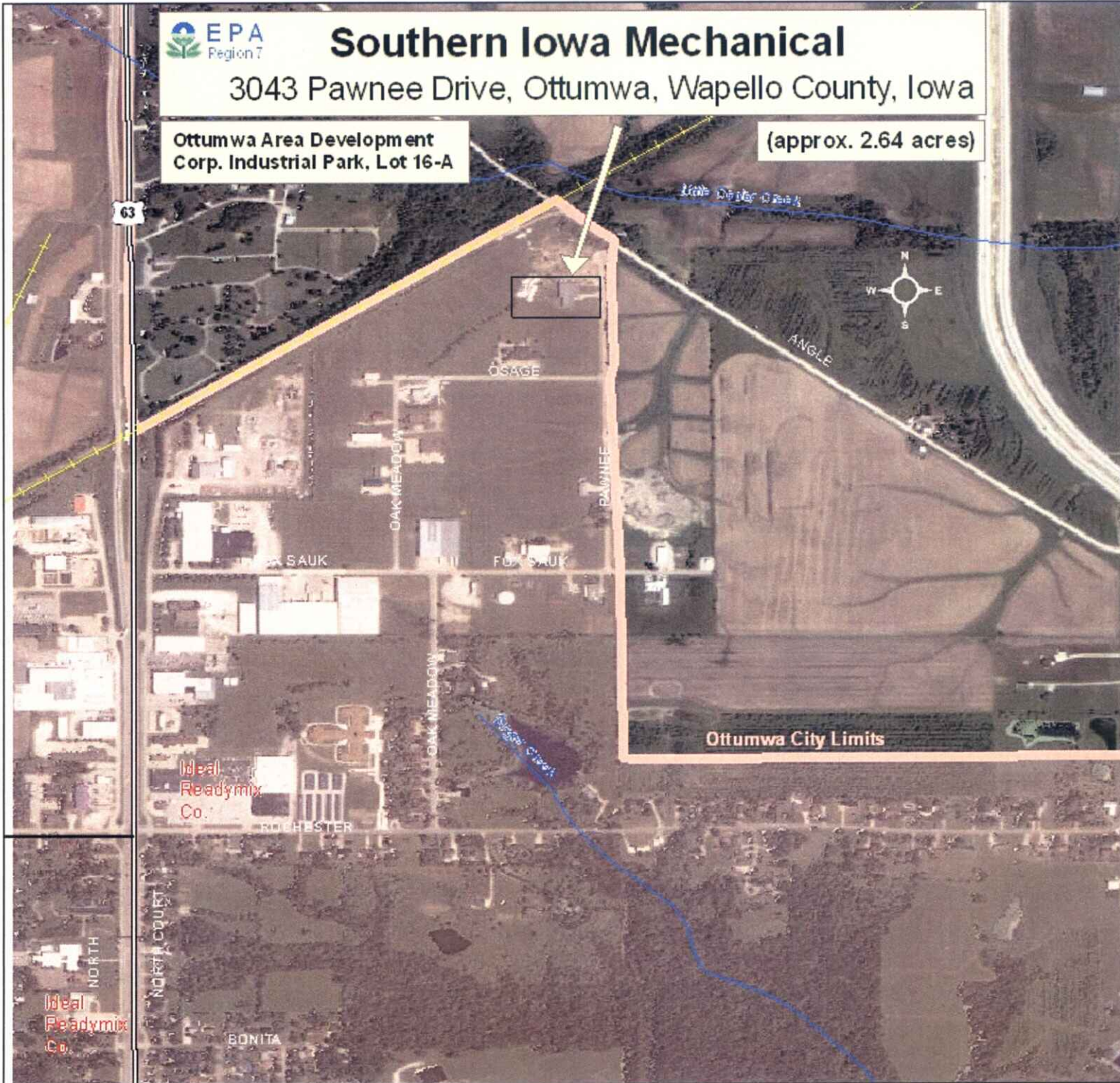


Southern Iowa Mechanical

3043 Pawnee Drive, Ottumwa, Wapello County, Iowa

Ottumwa Area Development Corp. Industrial Park, Lot 16-A

(approx. 2.64 acres)



Attachment I
Site Location Map

Appendix B

[To be completed before lodging based on deed]

Appendix C

(ABOVE SPACE RESERVED FOR RECORDER'S USE)

Type/Title of Document: Environmental Covenant

Document Date: Effective as of the date recorded at the Polk County
Recorder's Office

Grantor/Holder: City of Des Moines

Agency: United States Environmental Protection Agency

Return to: [Insert City of Des Moines Address]

Legal Description: See Exhibit 1 attached hereto

ENVIRONMENTAL COVENANT

This Environmental Covenant (Covenant) is established pursuant to Iowa Code (IC) chapter 455I entitled Uniform Environmental Covenants Act.

This Covenant is entered into by and between the City of Des Moines, Iowa as “Grantor,” the City of Des Moines, Iowa as “Holder,” and the United States Environmental Protection Agency as “Agency,” pursuant to Iowa’s Uniform Environmental Covenants Act (Act), Iowa Code sections 455I.1 – 455I.12. Grantor, Holder, and Agency enter into this Covenant for the purpose of subjecting the property described below to certain activity and use limitations in accordance with the terms and conditions specified herein.

1. **Affected Property.** The Grantor is the fee title owner of the approximately 43-acre property located southwest of the intersection of W. Martin Luther King Jr. Parkway and SW 16th Street in Des Moines, Polk County, Iowa, the “Property.” The property is legally described as: *[INSERT the legal description of the property from the property deed].*

2. **Agency Action.** The Property is the subject of response actions taken pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601 - 9675 (CERCLA) and is listed on the National Priorities List, 40 C.F.R. Part 300, App. B. The Property was owned and operated by Dico, Inc. (Dico) for approximately 40 years, whose operations at the Property included steel wheel manufacturing and chemical and pesticide formulation. Dico’s operations at the Property resulted in the release of trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), and vinyl chloride to the groundwater, residual pesticides and metals to shallow soils, and pesticides to buildings and soils on the southern end of the Property and drainage areas.

The remedy to address contaminated groundwater consists of a Groundwater Extraction and Treatment System. This system includes containing the contaminated groundwater so that it does not impact the north gallery of the Grantor’s nearby public water supply system, treating the groundwater with an air stripper to remove volatile organic compound (VOCs), discharging treated water, and operating extraction wells until water quality meets the regulatory standards for drinking water. This groundwater treatment system was constructed in December 1987 and has been operated by Dico since that time, along with groundwater monitoring.

Dico initially cleaned and encapsulated contaminated buildings and covered much of the Property with an asphalt cap to reduce migration of surface soils and to prevent human contact with contaminated soils and building materials. Contaminated soils were also excavated from the south pond and other drainage areas of the Property.

Pursuant to a 2020 Consent Decree entered into by and between, Dico, Titan Tire Corporation and the United States on behalf of the EPA, Dico transferred the Property to the City and the EPA and the City will perform additional response actions to address remaining contamination and prepare the Property for reuse and redevelopment. These response actions, and the corresponding Records of Decision for the site, will ensure that remedies in place at the Property are protective of human health and the environment. This Covenant is a component of those remedies.

3. **Risk Management and Institutional Controls.** Following the completion of response actions at the Property, contamination will remain at the Property which may present an unreasonable risk to public health and the environment if certain activities occur on the Property. As such, the Agency has determined that an Environment Covenant is necessary to manage the risk of future exposure by limiting specified activities at the Property and establishing affirmative obligations.

4. **Reopening.** The signatories acknowledge that the failure of the activity and use limitations imposed on the Property hereby to serve their intended purpose, including the prevention of exposure to contamination, could result in the Agency reopening its review and regulation of the contaminant condition on the Property.

5. **Identity of Grantor, Holder, and Agency.**

GRANTOR: The City of Des Moines, Iowa is the current owner of the Property and the Grantor of this Covenant.

HOLDER: The City of Des Moines, Iowa and its successors and assigns is the Holder of this Covenant.

AGENCY: The United States Environmental Protection Agency, and successor departments or agencies.

6. **Representations and Warranties.** The Grantor warrants to the other signatories to this covenant that it:

- a. is the sole fee title owner of the Property;
- b. holds sufficient fee title to the Property to grant the rights and interests described in this Covenant free of any conflicting legal and equitable claims; and
- c. has identified all other persons holding legal or equitable interests in the Property, including, but not limited to, contract buyers, mortgage holders, other consensual lienholders and lessees, and secured their consent either by signatures on this Covenant or by a separate subordination and consent agreement attached as Exhibit [INSERT Exhibit]].

7. **Running with the Land.** This Covenant is perpetual and runs with the land as provided in IC § 455I.9 until modified or terminated. The terms of this Covenant are binding on the Grantor and all successors in interest, assigns and all transferees acquiring or owning any right, title, lien or interest in the Property and their heirs, successors, assigns, grantees, executors, administrators and devisees. The term “transferee,” as used in this Covenant, shall mean any future owner of any interest in the Property or any portion thereof, including, but not limited to, owners of an interest in fee simple, contract buyers, mortgagees, easement holders and/or lessees.

8. **Activity and Use Limitations and Terms.** The property is subject to the following activity and use limitations:

- A. The Property may be used for non-residential purposes such as commercial or recreational uses. The Property may also be used for multi-family residential purposes such as apartments or condominiums, with prior EPA approval. However, the Property must not be used for first-floor residential occupancy, such as single-family homes or duplexes, or daycare facilities, elder care facilities, nursing homes, or hospitals;
- B. Breaching of the asphalt cap and excavation or other subsurface work is restricted in the area underlying the asphalt cap, also depicted in Exhibit x to this Covenant. Except in cases of emergency utility repair activities (such as a water or gas main break), any breach of the cap shall be approved in advance by EPA. After EPA has approved any work activity that requires the breaching of the cap, EPA shall be notified at least 7 calendar days prior to the start of the approved excavation or subsurface work in the area underlying the asphalt cap. Any such work must provide for managing soils or other materials that are disturbed in a manner that minimizes risk to human health or the environment and shall be conducted in accordance with a previously EPA-approved materials management plan.
- C. Groundwater at the Property shall not be consumed or otherwise used for any purpose, except as approved by EPA. Any additional proposed uses of the groundwater will require a written submittal by the Owner, or its transferee, detailing the use and a subsequent approval in writing from the EPA, after reasonable consultation with IDNR. No new groundwater wells shall be installed at the Property without the prior written approval of EPA.
- D. Groundwater monitoring and extraction wells and associated piping, pumps, structures and appurtenances comprising the groundwater remedy are present on the Property. Grantor and its transferees shall not damage, interfere with, or remove these remedy components, or allow them to be damaged, interfered with, or removed, without prior written authorization from the EPA. These remedy components may be disturbed if necessary during an emergency (such as a water or gas main break, fire, explosion or natural disaster), in which case notification shall be provided to EPA orally or in writing as soon as practicable, but no later than 72 hours after becoming aware of the disturbance. Within 30 days after such emergency has been abated, a written report shall be submitted to EPA describing such emergency and any response actions taken and including a plan to restore all affected remedy components to their fully operational state.
- E. To prevent or minimize exposures to soil gas vapors, any building or structure planned for human occupancy to be constructed on the Property shall include an appropriate vapor barrier or vapor mitigation system. A copy of pre-construction plans and/or as-built documentation of barrier or mitigation systems must be submitted to EPA. Preconstruction plans must be submitted 45 days prior to construction/as-built documentation must be provided 45 days following completion of construction. Vapor barrier or mitigation systems must be maintained as long as the human occupancy of buildings continue, so that the system continues to meet the intended function to protect human health from soil gas vapors.

If any person desires in the future to use the Property for any purpose or in any manner that is prohibited by this Covenant, EPA must be notified in advance so that a Modification, Temporary Deviation, or Termination request can be considered as described below. Further analyses and/or response actions may be required prior to any such use.

9. Notice of Non-Compliance. Any Property owner, or subsequent transferee of an interest in the Property, shall notify EPA as soon as possible of conditions which would constitute a breach of the activity and use limitations in paragraph 8 above if they have actual knowledge of these conditions or would reasonably be deemed to have knowledge within the normal course of administration of their Property interest.

10. Notice to Lessees. Grantor, any Holder with a property interest sufficient to grant a lease of the Property, and any subsequent transferee shall incorporate the activity and use limitations of this Covenant either in full or by reference to this instrument in any lease, license, or other instrument granting a right to possession of the Property, subject to the requirements of Paragraph 11.

11. Notice of Change in Ownership. Grantor, any Holder with a property interest sufficient to convey a possessory interest in the Property, and any subsequent transferee shall reference and incorporate the terms of this agreement into any subsequent instrument which conveys a possessory interest in the property.

12. Access to Property. Access to the Property is granted to EPA and their authorized representatives for the purpose of implementing, monitoring, and/or enforcing this Covenant. EPA agrees to provide the then current owner of the Property reasonable notice prior to access. Right of access includes, but is not limited to, the following:

- a. repair and maintenance of remedial action equipment, soil caps, groundwater monitoring wells and associated aboveground or subsurface structures;
- b. fencing and other technological controls;
- c. groundwater sampling and monitoring;
- d. additional drilling;
- e. construction of soil boring and/or groundwater monitoring wells; and
- f. other activities authorized or otherwise directed by Agency.

13. Groundwater Hazard Statement Notice. IC § 558.69 requires submission of a groundwater hazard statement and disclosure if “hazardous waste” exists on property as defined in IC § 455B.411(3) or if the Agency determines that solid waste exists on property that is potentially hazardous. If hazardous waste is present, the groundwater hazard statement must state that the condition is being properly managed. The signatories and all subsequent transferees required to submit a groundwater hazard statement under IC § 558.69 shall make reference to this Covenant in substantially the following form—filling in the blanks with the relevant and applicable details:

THE INTEREST CONVEYED IS SUBJECT TO AN ENVIRONMENTAL COVENANT, DATED _____, 2020, RECORDED IN THE POLK COUNTY, IOWA

RECORDER OF DEEDS OFFICE ON _____, 2020, IN
(document, book and page, or parcel number).

THE ENVIRONMENTAL COVENANT CONTAINS THE
FOLLOWING ACTIVITY AND USE LIMITATIONS: *[INSERT
the activity and use restrictions from section 8 here.]*

14. Modification and Termination. Any modification or termination of this Covenant shall comply with IC chapter 455I. This Covenant may be modified or terminated by written consent of Agency, the then current fee simple title owner, and all original signatories (unless exempted under the provisions of IC § 455I.10(1)“c” in accordance with and subject to the provisions of IC § 455I.10). The termination or modification is not effective until the document evidencing consent of all necessary persons is properly recorded. If not by consent, any modification or termination of this Covenant shall be in accordance with IC § 455I.9 and such additional terms as specified in this Covenant.

15. Enforcement. This Covenant may be enforced by the Agency in a civil action for injunctive or other equitable relief by the signatories and those persons authorized by and in accordance with IC § 455I.11.

16. Severability. If any provision of this Covenant is found to be unenforceable in any respect, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired.

17. Governing Law. This Covenant shall be governed by and interpreted in accordance with the laws of the State of Iowa.

18. Recordation. Within thirty (30) days after the date of the final required signature upon this Covenant or any amendment or termination thereof, Grantor or transferee shall record this Covenant with the Polk County, Iowa Recorders Office.

19. Effective Date. The effective date of this Covenant shall be the date upon which the fully executed Covenant has been recorded with the Polk County, Iowa Recorder’s Office.

20. Notice. Any notice, document, or other item required by this Covenant to be given to another party hereto shall be sent to:

If to Grantor/Holder:

If to EPA:
Director, Superfund and Emergency Management Division
U.S. Environmental Protection Agency, Region 7
11201 Renner Blvd.
Lenexa, KS 66219

20. Subordination and Consent. By signing this Covenant, the signatories knowingly and intelligently acknowledge their consent to the terms of this Covenant and agree to subordinate their interest in the Property. The following persons have expressly consented and subordinated interests: *[INSERT: Identify persons and entities that are consenting and subordinating their interests such as mortgagees and other consensual lienholders, lessees, etc. Identify the nature of the subordinated interest. If no subordinated interest, enter "None."]*

ACKNOWLEDGMENTS

GRANTOR/HOLDER

By: _____

Date: _____

Name (print): _____

Title: _____

AGENCY:

Mary Peterson
Director, Superfund and Emergency Management Division
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Date

STATE OF KANSAS)
) ss
COUNTY OF JOHNSON)

On this ____ day of _____, 202__, before me personally appeared _____, known to me to be the Director of the Superfund and Emergency Management Division of the United States Environmental Protection Agency, Region 7, and acknowledged that she executed the same as his/her voluntary act and deed.

Notary Public

SUBORDINATED INTERESTS:

[INSERT signature blocks and appropriate acknowledgements for all subordinated interests – If none then strike this heading and section.]

Appendix D

APPENDIX D
STATEMENT OF WORK
OPERATION AND MAINTENANCE

DES MOINES TCE, OU1 AND OU2
DES MOINES, POLK COUNTY, IOWA
SSID: 0725

1. INTRODUCTION

This Statement of Work (SOW) sets forth the requirements for the operation and maintenance of the Des Moines TCE Site, Operable Unit 1 (groundwater treatment system) and Operable Unit 2 (soil cap). Pursuant to the United States of America v. Dico, Inc. and Titan Tire Corporation Consent Decree (Consent Decree or CD), Docket No. 4:10-cv-00503-RP-RAW, the City will conduct operation and maintenance activities to ensure the existing site remedies continue to address groundwater contaminants and protect human health and the environment. The City will furnish all personnel and materials for the work required by the SOW, and the U.S. Environmental Protection Agency will provide oversight of the City's activities.

2. SCOPE OF REMEDY

2.1 **OU1 Remedy.** With regard to OU1, the scope of the remedy is to operate and maintain the remedy constructed to implement the ROD for OU1 (July, 21, 1986), which includes sampling of the monitoring well network, extraction wells to collect contaminated groundwater, isolation of the northern-most gallery, treatment of groundwater through air stripping to remove 96 percent of the trichloroethylene (TCE), and discharge of treated water to the Raccoon River. To the extent EPA issues or has issued any Explanation of Significant Differences (ESDs), such ESD(s) modify the scope of the remedy to include their terms.

2.2 **OU2 Remedy.** With regard to Operable Unit 2, the scope of the remedy is to continue the risk reduction achieved by the Surface Cap Removal Action (the construction of an asphalt cap as a protective cover over the majority of contaminated soils in OU2 and OU4). This includes inspection and maintenance activities, periodic sealing and/or repair of the asphalt cap, and land use restrictions, as set forth in Section 7.2.2 of the ROD for OU2/OU4.

3. IDENTIFICATION OF CONTRACTORS AND PROJECT MANAGERS

3.1 **City Contractor(s) and Subcontractor(s).** The City shall retain one or more contractors or subcontractors to perform the Work and shall notify EPA of the names, titles, addresses, telephone numbers, email addresses, and qualifications of such contractors or subcontractors within 45 days after the Effective Date. The City shall also notify EPA of the names, titles, contact information, and qualifications of any other contractors or subcontractors retained to

perform the Work at least 14 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 City. If EPA disapproves of a selected contractor or subcontractor, the City 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 30 days after EPA's disapproval. The qualifications of the persons undertaking the Work for the City shall be 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.

3.2 City Project Coordinator. Within 45 days after the Effective Date, the City shall designate a Project Coordinator who shall be responsible for administration of all actions by the City required by the CD and shall submit to EPA the designated Project Coordinator's name, title, address, telephone number, email address, and qualifications. To the greatest extent possible, the Project Coordinator shall be present on Property or readily available during Property work. EPA retains the right to disapprove of the designated Project Coordinator who does not meet the requirements above. If EPA disapproves of the designated Project Coordinator, the City shall retain a different Project Coordinator and shall notify EPA of that person's name, title, contact information, and qualifications within 14 days following EPA's disapproval. Notice or communication relating to the CD from EPA to the City's Project Coordinator shall constitute notice or communication to City.

3.3 EPA Remedial Project Manager. EPA has designated Tonya Howell of EPA Region 7's Superfund and Emergency Management Division as its Remedial Project Manager. The RPM shall be responsible for overseeing City's implementation of the SOW.

3.4 Change of Designated RPM or Project Coordinator. EPA and the City shall have the right, subject to EPA's right to disapprove pursuant to SOW Section 3.1, to change their respective designated RPM or Project Coordinator. The City shall notify EPA 3 days before such a change is made. The initial notification by the City may be made orally but shall be promptly followed by a written notice.

4. GROUNDWATER TREATMENT SYSTEM OPERATION & MAINTENANCE

4.1 Operation of Existing System. Initially, the City shall operate and maintain the existing groundwater treatment system (including periodic groundwater sampling and reporting) in accordance with the EPA-approved "Operation and Maintenance Manual, TCE Removal Facilities, Dico, Inc., Des Moines, Iowa" revised April 1989, including any EPA approved changes made to the O&M Manual since 1989.

4.2 Operation of Optimized System. The City shall submit a revised O&M Plan after receiving the EPA-generated O&M Manual. The City shall begin implementing the revised O&M Plan upon EPA's approval.

5. ASPHALT CAP OPERATION AND MAINTENANCE

5.1 **Asphalt Cap Operation and Maintenance.** The City shall operate and maintain the asphalt cap (including inspection and repair of the cap) in accordance with the “Asphalt Cap Operation and Maintenance Plan”, which is Appendix C of the “Work Plan, Surface Remediation, Dico, Inc.”, document dated August 29, 1994, until an O&M Plan submitted by the City pursuant to Section 6 of this SOW (Project Planning) is approved by EPA. The City’s O&M Plan shall include, at a minimum, the following requirements:

(a) **Preventative Maintenance.** If the asphalt cover is utilized by vehicular traffic, periodic sealing of the asphalt surface should be conducted at a minimum of once every five years to ensure cap integrity.

(b) **Frequency of Inspections.** While the site remains vacant, the City shall conduct annual inspections and repairs of the existing asphalt cap to ensure the integrity of the cap has not been compromised. A compromise of the cap integrity is defined as any situation where the underlying ground is exposed and/or where surface water is capable of infiltrating the asphalt and coming into contact with the ground. During redevelopment activities and after redevelopment has occurred, the frequency of inspections and repairs of the existing asphalt cap will increase from annually to monthly.

(c) **Discovery of Compromise of Cap Integrity.** Not more than three days after a cap inspection identifies a compromise of the cap’s integrity, or the City’s discovery at any other time of a compromise of the cap’s integrity, the City shall notify EPA of the cap breach with an estimated time frame for cap repairs, not to exceed 30 days. The City shall also notify EPA once repairs have been completed. These notifications can be made via email or phone. Inspection reports and a written summary of any cap repairs shall be prepared and submitted to EPA on an annual basis.

5.2. **Cap Enhancement.** The City may enhance the cap in the future, such as by grading clean fill material over the asphalt cap. An enhancement of the cap may change the preventative maintenance or frequency of inspection requirements. Any such enhancement will be done only with EPA approval via submission of a revised O&M Plan. A proposed O&M plan providing for enhancement of the asphalt cap will be submitted to EPA for review and approval prior to start of on-site activity and shall comply with the requirements of Section 6.

6. PROJECT PLANNING

In accordance with the Schedule of Deliverables set forth in this SOW, the City shall submit the operation and maintenance planning documents listed below.

6.1 Operation and Maintenance Plans (OU1 and OU2)

a) As set forth in Sections 4 and 5, the City will develop two separate Operation and Maintenance Plans (or update the existing O&M Plans) that will include: (1) the

operation of the current groundwater treatment tower or a new groundwater air stripper tray system and (2) the maintenance of the existing asphalt cap or equivalent capping material(s) that will prevent contact with contaminated site soils. The O&M Plans describe the requirements for inspecting, operating, and maintaining the remedies.

b) The O&M Plans shall be developed in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017). O&M Plans provide a project description and outline the technical approach to perform the tasks in this SOW, including corresponding personnel requirements, activity schedules, and due dates for key deliverables. The O&M Plans must include the following additional requirements:

(1) Description of performance standards required to be met to implement the remedies;

(2) Description of activities to be performed: (i) to provide confidence that performance standards will be met; and (ii) to determine whether performance standards have been met;

(3) O&M Reporting. Description of records and reports that will be generated during O&M, such as daily operating logs, laboratory records, records of operating costs, reports regarding emergencies, personnel and maintenance records, monitoring reports, and monthly and annual reports to EPA and State agencies;

(4) Description of corrective action in case of systems failure, including: (i) alternative procedures to prevent the release or threatened release of Waste Material which may endanger public health and the environment or may cause a failure to achieve performance standards; (ii) analysis of vulnerability and additional resource requirements should a failure occur; (iii) notification and reporting requirements should O&M systems fail or be in danger of imminent failure; and (iv) community notification requirements; and

(5) Description of corrective action to be implemented in the event that performance standards are not achieved; and a schedule for implementing these corrective actions.

6.2 **Soil/Materials Management Plan (SMMP).** City will prepare a SMMP to address the management of any soils or other materials beneath the cap in the event that the cap is breached for emergency repairs or planned construction. The SMMP shall discuss the following:

- (a) Project description (should be duplicated from the O&M plan).
- (b) Description of the area and contaminants subject to the SMMP.

- (c) Soil/materials management during excavation or construction and emergency work.
- (d) Personal protective equipment and training.
- (e) Waste segregation/stockpile management.
- (f) Dust control.
- (g) Surface water protection.
- (h) Equipment decontamination.
- (i) Imported soil backfill.
- (j) Cap restoration.
- (k) Characterization and disposal of excavated wastes.
- (l) Reporting.

6.3. **Off-Site Shipments.**

(a) The SMPP must comply with the requirements herein regarding off-site shipments. The City may ship hazardous substances, pollutants and contaminants from the Site to an off-site facility only if it complies with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. The City will be deemed to be in compliance with CERCLA Section 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if the City obtains a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b).

(b) The City may ship Waste Material from the Site to an out-of-state waste management facility only if, prior to any shipment, it provides written notice to the appropriate state environmental official in the receiving facility's state and to the RPM. This written notice requirement shall not apply to any off-site shipments when the total quantity of all such shipments will not exceed ten cubic yards. The written notice must include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. The City also shall notify the state environmental official referenced above and the OSC of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. The City shall provide the written notice after the award of the contract for the removal action and before the Waste Material is shipped.

(c) The City may ship Investigation Derived Waste (IDW) from the Site to an off-site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, EPA's "Guide to Management of Investigation Derived Waste," OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the Action Memorandum. Wastes shipped off-site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 C.F.R. § 261.4(e) shipped off-site for treatability studies, are not subject to 40 C.F.R. § 300.440.

6.4 Quality Assurance Project Plan (QAPP)

(a) City will prepare a QAPP to conduct sample collection and analytical activities in accordance with technically acceptable protocols and ensure that the data meet data quality objectives (DQOs). The QAPP must include a detailed explanation of the City's quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. The City shall develop the QAPP in accordance with *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006); *Guidance for Quality Assurance Project Plans*, QA/G-5, EPA/240/R 02/009 (Dec. 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005). The QAPP also must include procedures:

- (1) To ensure that EPA and its authorized representative have reasonable access to laboratories used by the City in implementing the CD (the City's lab(s));
- (2) To ensure that the City's lab(s) analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring;
- (3) To ensure that the City's lab(s) perform all analyses using EPA-accepted methods (i.e., the methods documented in *USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis*, ILM05.4 (Dec. 2006); *USEPA Contract Laboratory Program Statement of Work for Organic Analysis*, SOM01.2 (amended Apr. 2007); and *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)*, ISM01.2 (Jan. 2010)) or other methods acceptable to EPA;
- (4) To ensure that the City Labs participate in an EPA-accepted QA/QC program or other program QA/QC acceptable to EPA;
- (5) For the City to provide EPA with notice prior to any sample collection activity;
- (6) For the City to provide split samples and/or duplicate samples to EPA upon request;
- (7) For EPA to take any additional samples that it deems necessary;
- (8) For EPA to provide to the City, upon request, split samples and/or duplicate samples in connection with EPA's oversight sampling; and
- (9) For the City to submit to EPA all sampling and tests results and other data in connection with the implementation of the CD.

- (b) The QAPP shall also include the following discussions:
- (1) A project description (should be duplicated from the O&M plan).
 - (2) A project organization chart illustrating the lines of responsibility of key personnel involved in the sampling phase of the project.
 - (3) Data Quality Objectives (DQOs) for data such as the required precision and accuracy, completeness of data, representativeness of data, comparability of data, and the intended use of collected data.
 - (4) Sample custody procedures during sample collection, in the laboratory, and as part of the final evidence files.
 - (5) The type and frequency of calibration procedures for field and laboratory instruments, internal quality control checks, and quality assurance performance audits and system audits.
 - (6) Preventative maintenance procedures, schedule and corrective action procedures for field and laboratory instruments.
 - (7) Specific procedures to assess data precision, representativeness, comparability, accuracy, and completeness of specific measurement parameters.
 - (8) Data documentation and tracking procedures.

6.5 Health and Safety Plan (HSP). The City will develop an HSP on the basis of site conditions to protect personnel involved in site activities and the surrounding community during site activities. The plan should address applicable regulatory requirements contained in 20 CFR 1910.120(i)(2) – Occupational Health and Safety Administration, Hazardous Waste Operations and Emergency Response, Interim Rule, December 19, 1986; U.S. EPA Order 1440.2 – Health and Safety Requirements for Employees Engaged in Field Activities; U.S. EPA Order 1440.3 – Respiratory Protection; U.S. EPA Occupational Health and Safety Manual; and U.S. EPA Interim Standard Operating Procedures (September, 1982). The plan should provide a site background discussion and describe personnel responsibilities, protective equipment, health and safety procedures and protocols, decontamination procedures, personnel training, and type and extent of medical surveillance. The plan should identify problems or hazards that may be encountered and how these are to be addressed. Procedures for protecting third parties during site activities, such as visitors or the surrounding community, should also be provided. The EPA does not “approve” the HSP, but rather the EPA reviews it to ensure that all necessary elements are included, and that the plan provides for the protection of human health and the environment.

7. SUBMISSION OF DELIVERABLES

7.1 General Requirements for Deliverables

(a) Except as otherwise provided in the CD, City shall direct all submissions required by this SOW to the RPM at:

Tonya Howell
Remedial Project Manager
Superfund and Emergency Management Division
U.S. Environmental Protection Agency Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

(b) City shall submit all deliverables required by this SOW, the attached CD, or any approved work plans to EPA in accordance with the schedule set forth in such plan. The City shall submit all deliverables in electronic form. Technical specifications for sampling and monitoring data and spatial data are addressed below. All other deliverables shall be submitted to EPA 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, the City shall also provide EPA with paper copies of such exhibits.

7.2 **Technical Specifications for Deliverables**

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

(b) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (a) in the ESRI File Geodatabase format **or ESRI Shapefiles**; 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://edg.epa.gov/EME/>.

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

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

7.3 **Approval of Deliverables**

(a) Initial Submissions

(1) After review of any deliverable that is required to be submitted for EPA approval under the CD or the SOW, EPA shall: (i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.

(2) EPA also may modify the initial submission to cure deficiencies in the submission if: (i) EPA determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (ii) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

(b) **Resubmissions.** Upon receipt of a notice of disapproval, the City shall, within 30 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the deliverable for approval. After review of the resubmitted deliverable, EPA may: (1) approve, in whole or in part, the resubmission; (2) approve the resubmission upon specified conditions; (3) modify the resubmission; (4) disapprove, in whole or in part, the resubmission, requiring the City to correct the deficiencies; or (5) any combination of the foregoing.

(c) **Implementation.** Upon approval, approval upon conditions, or modification by EPA of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, will be incorporated into and enforceable under the CD; and (2) The City shall take any action required by such deliverable, or portion thereof. The implementation of any non-deficient portion of a deliverable submitted or resubmitted does not relieve the City of any liability for stipulated penalties under the CD.

7.4 **Schedule of Deliverables.** All deliverables and tasks required under this SOW must be submitted or completed by the deadlines or within the time durations listed in the Schedule of Deliverables set forth below. The City may submit proposed revised Schedules for EPA approval. Upon EPA’s approval, the revised Schedules supersede the Schedules set forth below, and any previously approved Schedules.

DELIVERABLE	DUE DATE
Draft QAPP (OU1 and OU2)	45 days after CD Effective Date
Draft HSP (OU1 and OU2)	45 days after CD Effective Date
Draft O&M Plan OU1	45 days after City receives O&M manual for system
Draft O&M Plan OU2	45 days after taking title to property

Draft revised O&M Plan for OU2, if necessary	90 days prior to modification of the existing asphalt cap, including placement of fill or other modification to existing surface.
Final QAPP (OU1 and OU2)	30 days after receiving final EPA comments.
Final HSP (OU1 and OU2)	30 days after receiving final EPA comments.
Final O&M Plan OU1	30 days after receiving final EPA comments.
Final O&M Plan OU2	30 days after receiving final EPA comments.
Annual Cap Inspection Reports	Annually, starting one year after CD Effective Date.
Monthly Groundwater Sampling Results Report	60 days after each monthly sampling event.
Annual Groundwater / Performance Evaluation Report	Annually, starting one year after CD Effective Date.
Certificates of insurance and copy of insurance policies	Annually, starting one year after CD Effective Date.

8. STATE PARTICIPATION

The City shall, at any time they send a deliverable to EPA, send a copy of such deliverable to the Iowa Department of Natural Resources (IDNR). EPA shall, at any time it sends a notice, authorization, approval, disapproval, or certification to the City, send a copy of such document to IDNR. IDNR will have a reasonable opportunity for review and comment prior to any EPA approval or disapproval of any deliverables that are required to be submitted for EPA approval.

Appendix E

ACTION MEMORANDUM

SUBJECT: Request for Approval and Funding for a Time-Critical Removal Action at the South Pond Area of the Des Moines TCE Site in Des Moines, Iowa

FROM: Timothy J. Curry, On-Scene Coordinator
Assessment, Emergency Response, and Removal Branch

THRU: Kenneth S. Buchholz, Chief
Assessment, Emergency Response, and Removal Branch

TO: Mary P. Peterson, Director
Superfund and Emergency Management Division

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed time-critical removal action described herein for the Des Moines TCE Site (Site) in Des Moines, Polk County, Iowa. The removal action will involve consolidation and disposal of pond sediments and nearby soils containing hazardous substances found within a drainage area of the Site referred to as the South Pond Area (SPA). Following cleanup, the SPA will remain as a natural feature for runoff retention from the Site.

The proposed time-critical removal action is necessary to address the immediate threat to human health and the environment posed by hazardous substances in SPA sediments and surrounding soil. The proposed time-critical removal action supports the planned redevelopment of the Site for commercial and mixed-use.

II. SITE CONDITIONS AND BACKGROUND

SITE NAME:	Des Moines TCE
SSID #:	0725
CERCLIS ID#:	IAD980687933
CERCLIS Sequence #:	RV001
REMOVAL CATEGORY:	Time-Critical
NATIONALLY SIGNIFICANT:	No
SITE LOCATION:	Des Moines, Polk County, Iowa
LAT/LONG:	41.577, -93.639

A. Site Description

The Site is in south-central Des Moines on the east side of a bend in the Raccoon River. In all, the Site encompasses more than 200 acres, of which the Dico, Inc. (Dico) property makes up approximately 43 acres. The property includes several buildings that were used for a variety of industrial operations occurring over 40 years of its early history.

1. Removal site evaluation

Historical operations at the Site have included a variety of industrial uses and operations including steel wheel manufacturing, chemical herbicide distribution, and pesticide formulation/distribution processes. Hazardous substances known to have been released at the Site include: trichloroethene (TCE), 1,2-dichloroethene (DCE), and vinyl chloride (found in groundwater); residual pesticides, dioxins, polychlorinated biphenyls (PCBs), and metals (found in shallow soils); and pesticides, dioxins, and PCBs within buildings and building construction materials.

The Site includes a surface water collection feature, the SPA, located at the south end of the Site. Migration of site contaminants due to weathering and runoff collects in the SPA. EPA sampling in June 2016 and May 2018 detected aldrin, dieldrin, chlordane, p,p'-dichlorodiphenyldichloroethane, p,p'-dichlorodiphenyldichloroethene and p,p'-dichlorodiphenyltrichloroethane in sediments and nearby soils above ecological screening values. This action addresses the contamination found in pond sediments and nearby soils at the SPA.

2. Physical Location

The Dico property is southwest of the intersection of West Martin Luther King Jr. Parkway and SW 16th Street in Des Moines, Polk County, Iowa. The Site is within Section 8, Township 78 North, Range 42 West. The city of Des Moines' primary business/commercial district and facilities housing various levels of government operations lie within several square city blocks to the east of the Site. The latitude and longitude of the approximate center of the Site is 41° 34'43.70" N, 93° 38'19.50" W.

3. Site Characteristics

The property lies on the east bank adjacent to a bend of the Raccoon river. Surface water across the Site generally drains from north to south. Surface water collects in an area of the Site identified as the SPA. Discharge from overflows of the SPA enter a drainage ditch on the east side of the property. The southern portion of the Site is within the Raccoon River flood plain (Federal Emergency Management Agency [FEMA] 1987).

Site geology consists of about 50 feet of alluvial sands and gravel, underlain by about 500 feet of shale and limestone. However, the soil profile on the Site has been altered by use of fill material to raise the topography above flood elevations. The saturated zone begins at about 20 feet below ground surface. The natural groundwater flow direction at the Site follows regional groundwater flow patterns paralleling the Raccoon River toward the south-southeast.

4. Release or threatened release into the environment of a hazardous substance, pollutant or contaminant.

Hazardous substances as defined in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which are documented to have been managed by the various operations at the Site, include:

- Aldrin
- Dieldrin
- 4,4-DDD
- 4,4-DDT
- 4,4-DDE
- Heptachlor
- Alpha chlordane
- Gamma chlordane
- Herbicides: 2,4,5-T
- Dioxin: 2,3,7,8-TCDD

Each of these substances is designated in 40 C.F.R. 302.4 as a CERCLA “hazardous substance” and has been documented to have been released into the environment at the Site.

The Site has been re-zoned for commercial and mixed use, and imminent redevelopment is anticipated, broadening the likelihood for potential exposure pathways and receptors to exist. The potential change in ownership and property use prompted the collection and analyses of samples of the SPA sediments for a re-evaluation of human health and environmental threats.

Analytical results from sediment samples collected at ten locations at the SPA and its outflow feature found elevated levels of the following contaminants:

- Aldrin
- Dieldrin
- Chlordane
- 4,4-DDD
- 4,4-DDT
- 4,4-DDE

Analytical results from surface water samples collected in the SPA found elevated levels of the following known site contaminants:

- Dieldrin

The levels of aldrin, dieldrin and chlordane in sediments and surface water exceed risk-based levels. The highest concentration of contaminants in sediment was aldrin at 4,300 micrograms/kilogram. The highest concentration of site contaminants in surface water at the SPA was dieldrin at 0.16 micrograms/liter. These results establish that releases of hazardous substances as defined by section 101(14) of CERCLA have occurred and have migrated to the SPA. The releases to the SPA are uncontrolled and may migrate further during flooding events by sediment transport to the drainage ditch leading to the river.

5. National Priorities List Status

The Site was listed on the National Priorities List in September 1983. The Remedial Investigation/Feasibility Study (RI/FS) for Operable Unit (OU) 1 was completed and the Record of Decision (ROD) signed by the EPA in 1986. The selected remedy was initiated in December 1987. The pump-and-treat system established under that action continues to be implemented. The RI/FS activities for OU2 and OU4 were completed in May 1996, and the ROD for OU2/OU4 was signed by the EPA in December 1996. The proposed removal action herein is consistent with the long-term remediation efforts planned for the Des Moines TCE Site.

6. Maps, pictures and other graphic representations.

Attached is a depiction of the locations of sediment and surface water samples collected from the SPA in May 2018.

B. Other Actions to Date

1. Previous Actions

Site remediation has been divided into four OUs:

OU1 – groundwater TCE plume on the Dico property;

OU2 – originated as source soils associated with TCE groundwater contamination, but later focused on residual pesticides and metals in shallow soils;

OU3 – a source area of tetrachloroethene groundwater contamination north of Dico; and

OU4 – pesticides in buildings and soil on the southern end of the Dico property (the SPA) and in drainage areas of the Dico property.

The ROD for OU1 was signed on July 21, 1986, to address TCE-impacted groundwater infiltrating the city of Des Moines public water supply through the Des Moines Water Works' north infiltration gallery. The major components of the OU1 remedy, as implemented, included the installation and operation of a groundwater extraction and treatment system, consisting of groundwater extraction wells and an air stripper, and the installation of groundwater wells across the Site.

In March 1994, the EPA issued a Unilateral Administrative Order (UAO) to Dico for the Building Response Action to address numerous hazardous substances within several on-site buildings. The hazardous substances were identified as pesticides, herbicides, dioxins, and PCBs. The action called for repairing, sealing, and protecting building insulation; cleaning the interior surfaces of the buildings; and encapsulation of building floors and walls by sealing with durable

epoxy/urethane protective coating to prevent direct-contact exposures. In June 1994, the EPA issued a second UAO to Dico for the Surface Capping Response Action. The action required either excavation of soils or capping of soils containing the pesticides aldrin, dieldrin, and chlordane above specified health-based levels. In December 1995, the EPA issued an Administrative Order on Consent to the DiChem Customer Group for the South Pond Area Response Action. The action required characterization, excavation, and off-site disposal of soils containing aldrin and chlordane above health-based cleanup levels from a drainage ditch adjacent to the east side of the Dico property and around the SPA. The on-site buildings, the contaminated soil, and the SPA are cumulatively OU2 and OU4.

The ROD for OU2 and OU4 was signed on December 13, 1996. Major components of the remedy included continued maintenance activities for the encapsulation of building materials and soils.

The ROD for OU3 was signed on September 18, 1992, to address potential sources of groundwater contamination in the area north of the Raccoon River, commonly known as the North Plume. The North Plume contains chlorinated volatile organic compounds present in low concentrations with no identified source. The ROD selected a no action remedy with periodic groundwater monitoring, acknowledging that groundwater from the OU3 area will continue to be captured and treated by the OU1 extraction and treatment system. The Iowa Department of Natural Resources currently manages OU3.

2. Current Actions

The remedial actions for OU1 and OU3, consisting of groundwater extraction and treatment and long-term monitoring, are ongoing.

The previous actions conducted within OU2 and OU4 served to reduce the risk to human health and the environment in these areas. The Site has been rezoned for commercial and mixed use, and imminent redevelopment is anticipated. With the future use expanding to new commercial/mixed use development, the potential for exposures would expand broadly across the population spectrum to include all ages and sensitivities. An addendum to the risk assessment for the Site was generated to evaluate the expanded exposure scenario as part of the Five-Year Review Process.

C. State and Local Authorities' Roles

1. State and Local Actions to Date

Iowa Department of Natural Resources (IDNR) is the support agency and has served in the roles of reviewer and advisor. In addition, IDNR has assumed full responsibility for the operation and maintenance of the remedy implemented at OU3.

Redevelopment of the Site for expanded uses has long been the goal of the local authorities. Redevelopment of EPA-regulated sites is also an agency goal. To support redevelopment, the local authorities have rezoned the area on and around the Site for usage including business and mixed residential. That rezoning significantly changes the potential population exposure scenario at the Site.

2. Potential for continued State and Local Response

IDNR will continue to remain in a monitoring/review/advisory role and is expected to work with the local government to address the demolition and disposal of other on-site structures, including the Production Building and Office Building. Local government will also ensure redevelopment of the Site conforms with any activity and use limitations imposed on the Site.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

Section 104 of CERCLA authorizes the EPA to conduct or to direct responsible parties to conduct removal actions whenever "any hazardous substance is released or there is a substantial threat of such a release into the environment." In addition, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, provides that the EPA may take any appropriate removal action when it determines, based on factors outlined in the NCP, that "there is a threat to public health or welfare of the United States or the environment." (See 40 C.F.R. § 300.415(b)(1-2).) When the lead agency makes the determination, based on factors in 40 CFR part 300.415(b)(2), that there is a threat to public health or welfare of the United States or the environment, the lead agency may take any appropriate removal action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release. The factors in 40 CFR part 300.41 S (b)(2) which apply to this Site are:

300.415(b)(2)(i) – Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, or pollutants, or contaminants.

At present, actual exposures may be occurring due to trespassers accessing the Site. The SPA is not secured from trespasser access, and a homeless population is known to reside nearby in the Frank DuPuydt Woods. Despite previous efforts by the owner to restrict access to the Site, evidence of activity immediately surrounding the SPA suggests that the area has and will continue to be accessed by trespassers.

With the future use expanding to commercial/mixed use development, the potential for direct contact exposures to the contamination at the SPA would expand broadly across the population spectrum to include all ages and sensitivities. An addendum to the risk assessment for the Site was generated to evaluate the expanded exposure scenario as part of the EPA's Five-Year Review Process. Sampling and analytical results from the field investigation phase documented a threat of adverse exposures:

- The South Pond Area is a drainage retention feature for the Site. Runoff from the Site, including contaminants of concern, migrate with surface water flows to the pond. The pond slows the flow rate sufficiently to allow for particulates to settle out. Pesticides associated with the previous site operations were found in both the pond sediments and surface water at

the SPA. This is evidence of the migration of releases of hazardous substances. The October 2015 Risk Assessment Addendum concluded that the concentrations of aldrin and dieldrin in the pond sediments presented a significant human health risk to a child recreationalist.

- The 2016 ecological risk assessment for the SPA additionally concluded that the concentrations of aldrin, dieldrin and chlordane in the uppermost layer of pond sediments present a significant ecological risk. The ecological organisms are much more sensitive to contamination levels. The preliminary remediation goals from the ecological risk assessment will drive the post remediation assessment of ongoing threats.

IV. ENDANGERMENT DETERMINATION

Actual or threatened release of a hazardous substance at this Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS

A. Proposed Action Description

In 2018, a Remedial Alternative Cost Estimate report was completed. There were five alternatives evaluated to address the contamination in the SPA.

The planned future uses of the Site anticipate that the pond remains as a surface water management and control feature. This expectation for the pond to remain leads to selecting the actions that collect contamination and dispose of it off site. The alternatives of excavation and dredging have been selected for implementation. Table 1 below lists the ecological remediation goals for the top 24 inches of the SPA sediments and surrounding soils.

Table 1. Ecological Remediation Goals for top twenty-four inches

Contaminant	Sediment PRG (mg/kg)	Soil (mg/kg)
Aldrin	0.080	0.0128
Chlordane (Total)	0.018	0.250
Dieldrin	0.062	0.0128

Post excavation sampling and analyses of remaining sediment/soils will be compared to these ecological remediation goals. Achieving residual contaminant concentrations below these ecological remediation goals will be protective of exposure risks to both human and ecological receptors. Should residual levels of these contaminants at the post-excavation surface exceed the above levels, a clean cover material will be established to provide a barrier to any future direct contact exposures for both ecological and human receptors. Perimeter monitoring for potential off-site impacts will occur throughout the cleanup of the SPA.

B. Contribution to Remedial Performance

The proposed actions for this Site will significantly contribute to the reduction of potential exposures to the COCs at the Site, while remaining consistent with the protective remedial actions previously identified and implemented for the Site.

C. Applicable and Relevant or Appropriate Requirements

The NCP, at 40 CFR § 300.415, requires that removal actions shall, to the extent practicable and considering the exigencies of the situation, attain applicable or relevant and appropriate state requirements (ARARs) under federal environmental, state environmental, or facility-siting laws. A letter has been sent to the state requesting that ARARs be identified for this Site. A list of potential ARARs is also located in the focused feasibility study, Remedial Alternatives for the South Pond Area, in Section 4.0.

D. Project Schedule

It is expected that this action may begin within 180 days of the approval of this Action Memorandum, contingent on the availability of cleanup crews and equipment. The field work is expected to take eight to twelve weeks to complete and may require demobilization while disposal arrangements are completed.

VI. ESTIMATED COSTS

The costs associated with this removal action are estimated as follows:

Direct Extramural Costs (ERRS/START Contract Costs)	\$ 841,630
Direct Intramural Costs	\$ 25,000
EPA Indirect Costs (43.21%)	\$ <u>374,471</u>
Total Project Costs:	\$ 1,241,101

Direct costs include direct extramural and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgement interest, do not consider other enforcement costs, including Department of Justice costs, and may be adjusted during a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation from actual total costs from this estimate will affect the United States' right to recovery. The indirect rate is currently 43.21%. The indirect rate charged to the proposed ceiling reflects the current interest rate.

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Should this removal action not be taken or be delayed, contaminants in the sediments of the SPA will remain in place. Surface water from the SPA has been shown to contain contaminants of concern from the Site. Overflows of surface water to the drainage ditch pose a threat of migration, creating an increased threat of exposure to hazardous substances in the environment and increased risk for off-site migration of contaminants.

VIII. OUTSTANDING POLICY ISSUES

None.

IX. RECOMMENDATION

This decision document represents the selected removal action for the contaminated soils and sediments at the SPA portion of the Site. The removal action was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based on the Administrative Record for the Site.

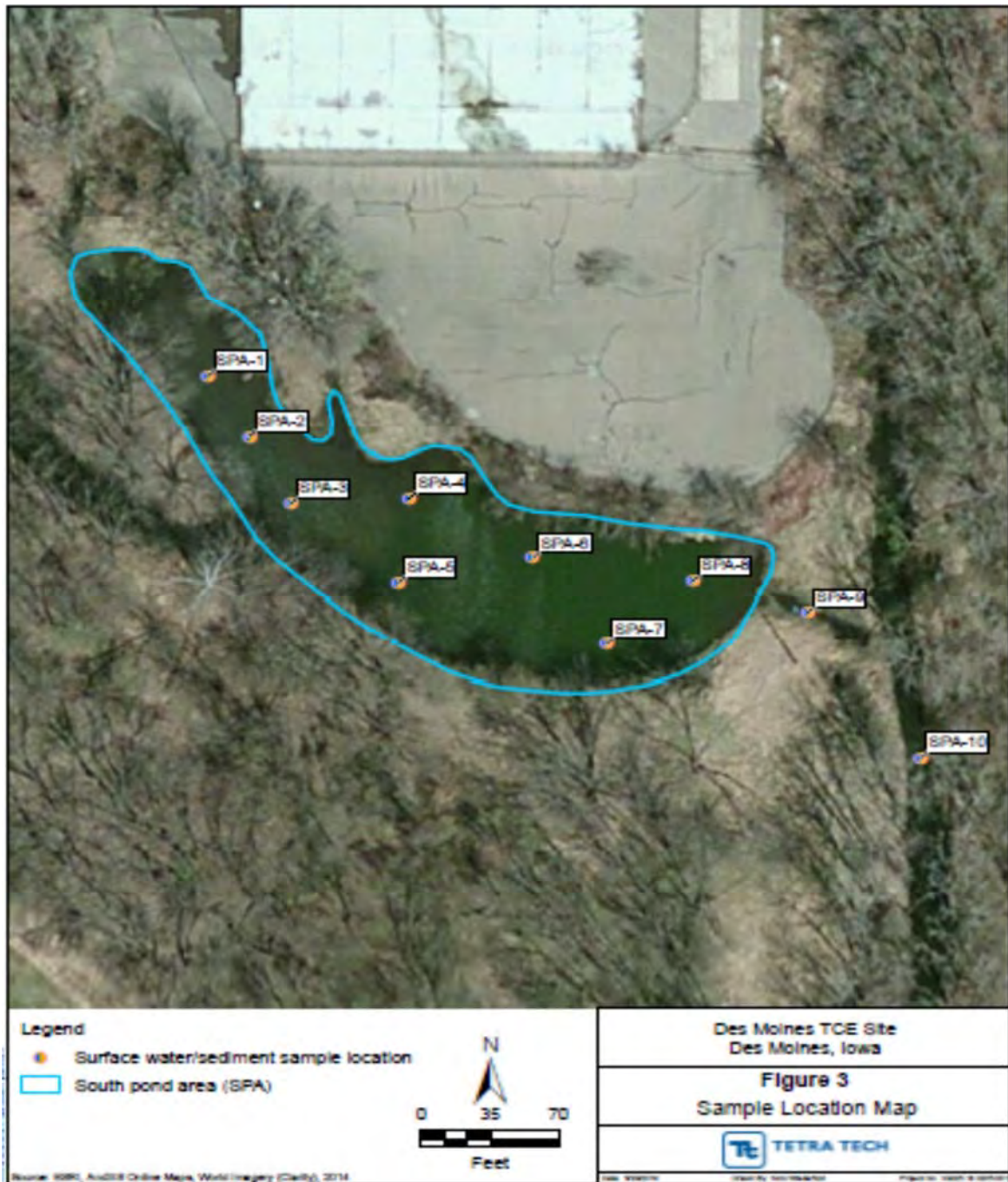
Conditions at the Site meet NCP section 300.415(b) criteria for a removal action, and I recommend your approval of the proposed removal action. The removal ceiling, if approved, will be \$841,630. This amount comes from the Regional Removal Advice of Allowance.

Approved:

Mary P. Peterson, Director
Superfund and Emergency Management Division

Attachment

Figure 1. South Pond Area Sediment Sampling Locations



Appendix F

ACTION MEMORANDUM

SUBJECT: Approval and Funding for a Non-Time-Critical Removal Action at the Des Moines TCE Site, Operable Unit 4, in Des Moines, Iowa

FROM: Timothy J. Curry, On-Scene Coordinator
Assessment, Emergency Response and Removal Branch

THRU: Kenneth Buchholz, Chief
Assessment, Emergency Response and Removal Branch

TO: Mary P. Peterson, Director
Superfund and Emergency Management Division

I. PURPOSE

The purpose of this Action Memorandum is to request, and document approval of, the proposed non-time critical removal action described herein for the Des Moines TCE Site (“site”) in Des Moines, Iowa. The removal action will involve demolition and removal of certain onsite buildings that are either integrated with hazardous substance containing materials and/or shown to contain site contaminants from releases that occurred during historical production operations. This action will involve the dismantling of Buildings 1, 2, and 3, as depicted on the attached site map, and the subsequent removal and off-site disposal of demolition debris to eliminate potential exposures. This removal action will support redevelopment of the site for industrial, commercial, and/or recreational uses with appropriate restrictions. The portion of the site addressed under this action memo is a part of Operable Unit 4.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

The site is in south-central Des Moines on the east side of a bend in the Raccoon River. In all, the site encompasses more than 200 acres of which the Dico, Inc. (Dico) property occupies approximately 43 acres. The property includes several buildings that were used for a variety of industrial operations for over 40 years. Buildings to be addressed in this removal action include the buildings known as Buildings 1, 2, and 3. A larger production building and a former office building are also located nearby on the Dico property, but they will not be addressed under this removal action.

1. Removal site evaluation

The site includes buildings and/or the remaining foundations of buildings that were used for a variety of industrial/commercial production, packaging and storage operations throughout its history. Buildings 1, 2, and 3, which will be addressed by this removal action, all lie within the larger Dico property which includes an area of soil contamination that has been encapsulated by an asphalt cap and an underlying groundwater contaminant plume that is being addressed through an air stripping system.

Historical operations at the site included a variety of industrial uses and operations including steel wheel manufacturing, chemical herbicide distribution, and pesticide formulation/distribution processes. Hazardous substances known to have been released during Dico's operations at the site include: trichloroethene (TCE), 1,2-dichloroethene (DCE), and vinyl chloride (all found in groundwater); residual pesticides, dioxins, polychlorinated biphenyls (PCBs), and metals (all found in shallow soils); and pesticides, dioxins, and PCBs within buildings and building construction materials. More detailed site information is in the Engineering Evaluation/Cost Analysis (EE/CA) developed for this site.

Samples of building materials were collected from various locations of the buildings. Concrete core samples were collected from building foundations and slabs, and wipe samples were collected from various building surfaces. Sample analytical results indicated the presence of pesticides, PCBs, and dioxins in the building materials.

Historical land use in the area surrounding the Dico property involved primarily industrial and large commercial operations. In recent years, land use surrounding Dico has changed and much of the surrounding area has been rezoned. For several years, the City of Des Moines has been planning and executing redevelopment projects within the River Point West area east of the Dico property. The city has rezoned the area, including the Dico property, from Industrial to Central Business Mixed Use District C-3 B. The new zoning provides a basis for re-evaluating appropriate cleanup strategies for the Dico property. The change in land use will result in hazardous substances within the buildings presenting potential and/or actual exposures to human health and the environment. Dismantling and off-site disposal of the buildings will address those threats. The remedy selected for site soils and groundwater in the EPA-issued 1996 Record of Decision (ROD) and the 1986 ROD, respectively, will remain in place, and appropriate property use restrictions will be established to ensure the current zoning and redevelopment efforts are consistent with ongoing actions to protect human health and the environment.

2. Physical Location

The Dico property is southwest of the intersection of W. Martin Luther King Jr. Parkway and SW 16th Street in Des Moines, Polk County, Iowa. The site is within Section 8, Township 78 North, Range 42 West. The city of Des Moines' primary business/commercial district and facilities housing various levels of government operations lies within several square city blocks to the east of the site.

3. Site Characteristics

The Dico property lies on the east bank, adjacent to a bend of the Raccoon river. Surface water across the site generally drains from north to south, to the Raccoon River. Surface water collects in an area of the site identified in site records as the south pond area, or SPA. Discharge from overflows of the SPA enter a drainage ditch on the east side of the property. The southern portion of the site is within the

Raccoon River flood plain (Federal Emergency Management Agency [FEMA] 1987).

Site geology consists of about 50 feet of alluvial sands and gravel, underlain by about 500 feet of shale and limestone. However, the soil profile on the site property has been altered by use of fill material to raise the topography above flood elevations. The saturated zone begins at about 20 feet below ground surface (bgs). Natural groundwater flow direction at the site follows regional groundwater flow patterns paralleling the Raccoon River toward the south-southeast.

4. Release or threatened release into the environment of a hazardous substance, pollutant or contaminant.

Dico produced various pesticides/herbicides including 2,4-trichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T). The results of the June 2016 sampling show that dioxin was detected in several of the building materials samples. Dioxins are known to be contaminants generated during the production of 2,4,5-T. Polychlorinated biphenyls, PCBs, were also detected in several of the June 2016 building material samples. The highest PCB detection, 58 parts per million (ppm), was found in Building 3 in a sample of the epoxy paint and building material (brick/cinder block). Previous samples from another area in the buildings showed even higher concentrations of PCBs within the buildings' construction materials used for roofing/insulation. Of the construction materials sampled from Buildings 1 and 2, analytical results showed elevated levels of sixteen different organo-pesticides. Samples of construction materials in Building 3 had analytical results showing elevated levels of seventeen different organo-pesticides. Site investigation sampling and analytical results show that the building construction materials have previously been in direct contact with releases of hazardous substances during production, packaging and storage operations. These substances are adhering or have been absorbed into the immediate interior surface of the buildings.

Previous remedial actions at the site were based on an industrial land use exposure scenario which was consistent with the use of the property at that time. The initial remediation action negotiated with the responsible party addressed the threat of contact exposure and migration of hazardous substances by the cleaning of building surfaces and then encapsulating surfaces with an inert material. The previous response actions provided a physical barrier between the contaminated buildings, preventing direct contact with the hazardous substances and hazardous substance migration. This encapsulation approach was considered effective while the property use remained commercial/industrial and the encapsulating coating was regularly maintained to prevent chipping, spalling and/or cracking.

In 1995, Dico ceased wheel manufacturing operations at the site. Limited operations continued at the site until 2001, when all manufacturing operations were shut down and the on-site buildings were vacated. In 2002, the request to cease the maintenance of the encapsulation was granted with the requirement to annually certify that the site remained unoccupied.

The buildings have remained unoccupied without climate control systems and regular maintenance for an extended time and are in a state of disrepair. The original encapsulation integrity has become compromised in areas and these weathering and wearing effects continue to worsen over time. The degradation of encapsulation materials can cause the migration of contaminants to off-site areas. Without an onsite productive business consistently operating, the site buildings became an attractive spot for sheltering nearby transient populations. To limit transient activity, the landowner established site access controls. The controls have reduced transient use but have not eliminated trespassing.

The rezoning of the site expands the potential usages of the site to situations that no longer match the previous industrial/commercial exposure assumptions. There now exists increased potential for public access that allows direct contact exposures for extended duration to a broader spectrum of the population. The previous exposure assumptions are no longer applicable, and the conducted response actions are no longer protective, of the reasonably anticipated future land use of the site. The threat of direct exposure and migration of contaminants will continue until the proposed action is completed.

5. National Priority List Status

The Des Moines TCE site was listed on the NPL in September 1983. The Operable Unit No. 1 (OU1) Remedial Investigation/Feasibility Study (RI/FS) was completed and the Record of Decision (ROD) signed in 1986 and the selected remedy initiated in December 1987. This operable unit addressed the contaminated groundwater at the site, and the pump and treat system established under that action continues to the present. RI/FS activities for Operable Units No. 2 and 4 (OU2 and OU4) were completed in May 1996 and the ROD for OU2/OU4 was signed in December 1996. The proposed removal action herein is consistent with the long-term remediation efforts planned for the site.

6. Maps, pictures and other graphic representations.

Maps and aerial images with annotations of site features are included in the EE/CA as an attachment.

B. Other Actions to Date

1. Previous Actions

Site remediation efforts have been divided into four operable units (OU):

OU1 – groundwater TCE plume on the Dico property;

OU2 – originated as source soils associated with TCE groundwater contamination, but later focused on residual pesticides and metals in shallow soils

OU3 – a source area of tetrachloroethene (PCE) groundwater contamination north of Dico; and

OU4 – pesticides in buildings and soil on the southern end of the Dico property (a.k.a., South Pond Area [SPA]), and in drainage areas of the Dico property.

The Record of Decision (ROD) for OU1 was signed on July 21, 1986 to address trichloroethene-impacted groundwater infiltrating the city of Des Moines public water supply through the DMWW north infiltration gallery. The major components of the OU1 remedy included the installation and operation of a groundwater extraction and treatment system consisting of groundwater extraction wells and an air stripper and the installation of groundwater wells across the site.

In March 1994, the EPA issued a Unilateral Administrative Order, or UAO, to Dico for the Building Response Action to address numerous hazardous substances within several on-site buildings. The hazardous substances were identified as pesticides, herbicides, dioxins, and PCBs. The action called for repairing, sealing, and protecting building insulation; cleaning the interior surfaces of the buildings and encapsulation of building floors and walls by sealing with durable epoxy/urethane protective coating to prevent direct-contact exposures. In June 1994, the EPA issued a second UAO to Dico for the Surface Capping Response Action. The action required either excavation of soils or capping of soils containing the pesticides aldrin, dieldrin, and chlordane above specified health-based levels. In December 1995, the EPA entered into an Administrative Order on Consent with the “DiChem Customer Group” for the South Pond Area Response Action. The action required characterization, excavation, and offsite disposal of soils containing aldrin and chlordane above health-based cleanup levels from a drainage ditch adjacent to the east side of the Dico property and around the South Pond Area. The onsite buildings, the contaminated soil, and the South Pond Area are cumulatively OU2 and OU4.

The ROD for OU2 and OU4 was signed on December 13, 1996. Major components of the remedy included continued maintenance activities.

The ROD for OU3 was signed on September 18, 1992 to address potential sources of groundwater contamination in the area north of the Raccoon River, commonly known as the “North Plume.” The North Plume contains chlorinated volatile organic compounds present in low concentrations in groundwater with no identified source. The ROD selected a “no action” remedy with periodic groundwater monitoring, acknowledging that groundwater from the OU3 area will continue to be captured and treated by the OU1 extraction and treatment system. The Iowa Department of Natural Resources currently manages OU3.

2. Current Actions

The remedial actions for OU1 and OU3, consisting of groundwater extraction and treatment and long-term monitoring, are ongoing.

The actions conducted within OU2 and OU4 served to reduce the risk to human health and the environment in these areas. The choice to cap contamination and then manage risks through the establishment/maintenance of barriers and site

access control was accepted as effective for the existing property use. The efforts agreed to previously did not eliminate the potential for a threat to human health and the environment. A five-year review of remedial performance conducted by EPA in 2013 concluded that planned uses for the site would include exposure to a broader spectrum of the public. The review prompted additional sampling and analyses of the buildings in this operable unit. Sampling and analyses results confirmed that exposure threats are still present. These threats will be addressed by the removal action to be conducted as set forth in this Action Memorandum prior to site redevelopment.

C. State and Local Authorities' Roles

1. State and Local Actions to Date

Iowa Department of Natural Resources (IDNR) is the support agency and has served in the role as reviewer and advisor to EPA. In addition, IDNR has assumed full responsibility for the O&M of OU3.

Redevelopment of the site for expanded uses has long been the goal of the local authorities. Redevelopment of EPA regulated sites is also an agency goal. To support redevelopment, the local authorities have rezoned the area on and around the site for usage including business and mixed residential. That zoning significantly changes the human exposure scenario for the site.

2. Potential for continued State and Local Response

IDNR will continue to remain in a monitoring/review/advisory role and is expected to work with local authorities to address the demolition and disposal of other onsite structures, including the Production Building and Office Building. Local government will also ensure that redevelopment of the site follows any activity and use limitations as established by an environmental covenant to be recorded on the Dico property.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §§ 9601 – 9675), or CERCLA, authorizes the EPA to conduct or to direct responsible parties to conduct removal actions whenever "any hazardous substance is released or there is a substantial threat of such a release into the environment." In addition, the National Oil and Hazardous Substances Pollution Contingency Plan (40 C.F.R. Part 300), or NCP, provides that the EPA may take any appropriate removal action when it determines, based on multiple factors outlined in the NCP, that "there is a threat to public health or welfare of the United States or the environment." See 40 C.F.R. § 300.415(b)(1-2). When the agency determines that a removal action is appropriate and a planning period of at least six months exists before on-site activities will be initiated, the NCP establishes additional requirements for the use of non-time critical removal authority, or NTCRA.

In support of the agency's determination that the contaminated on-site buildings constitute a threat to public health or the environment and, therefore, that a NTCRA is appropriate at this time, the applicable NCP criteria and suggested NTCRA considerations are reviewed in turn below.

A. Factors for Determining the Appropriateness of a Removal Action

Section 300.415(b)(2) of the NCP, 40 C.F.R. § 300.415(b)(2), provides a list of factors for the EPA to consider in determining whether a removal action is appropriate. Factors applicable to the removal action planned for this site are:

1. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

The changing land use of the site by rezoning and redevelopment from industrial to commercial/ mixed use, requires the demolition of the contaminated on-site buildings. Hazardous substances within Buildings 1, 2, and 3 present an actual or potential exposure to human health and the environment. On-site buildings contain PCBs and pesticide residue, including Aldrin and dioxin. Given the changing land use in the area and the rezoning of the site for mixed use development, the buildings must be dismantled and disposed of to limit a direct contact threat to human and ecologic receptors. Dismantling and proper disposal of building materials would eliminate human exposure via inhalation, incidental ingestion, and dermal absorption to contamination present within site buildings.

Additionally, the 2013 five-year review identified a risk to trespassers in the buildings at OU4 due to broken windows and unsecured entrances in the buildings where the encapsulation over the contaminated areas has failed over time. Though the trespassing issue has improved at times, in the absence of this response action, the buildings will continue to deteriorate, creating a greater potential for releases, and threat of releases, of hazardous substances into the environment, and therefore the greater potential for exposure to nearby human populations, animals, or the food chain.

2. Actual or potential contamination of drinking water supplies or sensitive ecosystems.

Not applicable to the proposed NTCRA. TCE and PCE groundwater plumes on site are being addressed under the remedial process.

3. Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.

Not applicable, as drums, barrels, tanks, or other bulk storage containers were addressed in previous actions.

4. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

On-site soils are contaminated with pesticides. Following demolition of the buildings, ensuring the integrity of the asphalt cap surrounding building foundations will prevent human exposure to hazardous substances in site soils at levels that pose unacceptable risk to commercial and recreational uses.

5. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

As stated above, the contaminated buildings are deteriorating. Encapsulation of the contaminated areas has failed over time and will continue to fail. Portions of the buildings are open to the elements and weather conditions may accelerate deterioration and cause hazardous substances to be released, allowing them to migrate. In the absence of this response action, the buildings will continue to deteriorate, creating a greater potential for releases, and threat of releases, of hazardous substances into the environment, and therefore the greater potential for exposure to nearby human populations, animals, or the food chain.

6. Threat of fire or explosion.

Not applicable.

7. The availability of other appropriate federal or state response mechanisms to respond to the release.

The EPA has worked closely with the IDNR in developing the proposed NTCRA. The IDNR supports the EPA's efforts to ensure that contamination within on-site buildings is expeditiously addressed. There are no other known federal or state response mechanisms available to respond to these releases, or threats of releases.

8. Other situations or factors that may pose threats to public health or welfare of the United States or the environment.

At this time, contamination within on-site buildings is not known to present other circumstances that pose threats to public health, welfare, or the environment.

B. Factors for Determining the Appropriateness of the NTCRA Process

A central feature of the EPA's Superfund program philosophy is integration of the removal and remedial programs in order to achieve the greatest human health and environmental protection in the most efficient manner. To this end, the EPA has urged Superfund decision makers to broadly use the CERCLA removal authority to achieve timely and protective results. Due to process and statutory differences between removal and remedial actions, the determination of which approach is most appropriate for a site is made by the EPA on a case-by-case basis. In addition to considering the NCP factors

outlined above, existing EPA guidance directs consideration of the following factors in determining whether to employ a NTCRA:

1. Time-sensitivity of the response

Changing land use has made the condition of the buildings and associated chemicals of concern a potential exposure threat to human health and the environment. The buildings are deteriorating and will continue to deteriorate, releasing hazardous substances, in the absence of this response action. Demolition and disposal of the buildings will be conducted to prevent exposure to human health and the environment from inappropriate handling and disposal of building materials.

2. Complexity of both the problems to be addressed and the action to be taken.

The EPA has determined that the demolition and disposal of the buildings through a NTCRA is appropriate to address the deterioration and continued threat of release of hazardous substances into the environment. An Engineering Evaluation/Cost Analysis (EE/CA) which addressed options for building dismantling and disposal was prepared by EPA in 2017. The EPA is pursuing a NTCRA to expedite building dismantling and disposal and encourage redevelopment of the property.

3. Comprehensiveness of the proposed action.

The removal alternatives developed under the EE/CA address the contamination associated with the on-site buildings by dismantling and disposal. This is a comprehensive action and no further action will be required to address the contaminated buildings.

IV. ENDANGERMENT DETERMINATION

Actual or threatened release of a hazardous substance at this Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS

A. Proposed Action Description

In 2017, an Engineering Evaluation/Cost Analysis (EE/CA) was completed in order to define the most efficient and effective approach to address the potential exposures from the contamination found in the building and its construction materials. The EE/CA concluded that the most effective approach to the buildings is demolition and off-site disposal.

The EE/CA outlined the following approach to the site:

- Those building construction materials that have been identified as containing or integrated with hazardous substances such as asbestos and PCBs will be abated to the extent it does not compromise the structural integrity of the building and thus the safety of workers. Materials containing greater than 50 milligrams per kilogram (mg/kg) of PCBs will be disposed of at a Toxic Substances Control Act (15 U.S.C. §§ 2601 – 2695d) approved landfill.
- The remaining portions of the building will be dismantled and disposed of. Metal construction materials that can be decontaminated will be sent for scrap metal recycling as appropriate. Dismantled building materials will be sampled and disposed in accordance with all Applicable, Relevant and Appropriate Requirements (ARARs).
- Equipment used in the process of dismantling the buildings will be cleaned and sampled for chemicals of concern (COCs) prior to being released for return to the owner.
- Perimeter monitoring for potential off-site impacts will occur throughout the dismantling and disposal process.

B. Contribution to Remedial Performance

The proposed actions for this site will significantly contribute to the reduction of potential exposures to the hazardous substances present at the site. The proposed action will provide greater opportunity for planning and developing the site for uses that improve the local community while remaining consistent with the protective remedial actions previously identified for the site.

C. EE/CA

Alternatives to the proposed removal actions were considered and discussed in the EE/CA. The proposed actions were chosen based on a comparative analysis of effectiveness, ability to implement, and cost.

D. ARARs

The NCP, at 40 CFR § 300.415, requires that removal actions shall, to the extent practicable and considering the exigencies of the situation, attain ARARs under federal environmental, state environmental, or facility-siting laws. The state has been asked to identify ARARs for this site. The federal and state ARARs for the site are discussed in Section 2.2 of the EE/CA. Table A-3 in Appendix A of the EE/CA provides a list of federal and state ARARs for the site.

E. PROJECT SCHEDULE

It is expected that this action may begin within 14 days of approval of this Action Memorandum contingent on the availability of cleanup crews and equipment. The field work is expected to take 12 to 16 weeks to complete and may require demobilization while disposal arrangements are completed.

VI. ESTIMATED COSTS

Estimated costs for this NTCRA will be inserted at a later date.

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Building construction materials at the site have deteriorated due to weather and lack of maintenance over time. Trespassers continue to enter the buildings despite the attempts to restrict access. If action is delayed, the condition of the buildings construction materials is expected to deteriorate further resulting in an increased threat of releases of hazardous substances to the environment, increased risk for off-site migration of contaminants, and increased risk to trespassers. Delaying action will also delay the planning and implementation of responsible redevelopment of the property for beneficial future uses.

VIII. OUTSTANDING POLICY ISSUES

None.

IX. RECOMMENDATION

This decision document represents the selected removal action for the contaminated buildings at the site. The removal action was developed in accordance with CERCLA, and is not inconsistent with the NCP. This decision is based on the Administrative Record for the site.

Conditions at the site meet NCP criteria for a removal action, and I recommend your approval of the proposed removal action.

Approved:

Mary P. Peterson, Director
Superfund and Emergency Management Division

Date

Appendix G



June 11, 2020

Ms. Tonya Howell
Remedial Project Manager
U.S. Environmental Protection Agency, Region 7
11201 Renner Blvd
Lenexa, Kansas 66219

Subject: **Remedial System Optimization Memorandum
Des Moines TCE Site, Des Moines, Iowa
U.S. EPA Region 7 START 5, Contract No. 68HE0719D0001,
Task Order No. 19F0074
Task Monitor: Tonya Howell, Remedial Project Manager, Superfund
Redevelopment Initiative Coordinator**

Dear Ms. Howell:

Tetra Tech, Inc. is submitting the attached Remedial System Optimization Memorandum regarding ongoing remedial operations at the Des Moines TCE Site in Des Moines, Iowa. If you have any questions or comments, please contact me at (816) 412-1767.

Sincerely,

A handwritten signature in blue ink that reads "Mike Williams".

Mike Williams, CPG
START Project Manager

A handwritten signature in blue ink that reads "Ted Faile".

Ted Faile, PG, CHMM
START Program Manager

Enclosures

**REMEDIAL SYSTEM OPTIMIZATION MEMORANDUM
DES MOINES TCE SITE
DES MOINES, IOWA**

**Superfund Technical Assessment and Response Team (START) 5
Contract No. 68HE0719D0001, Task Order No. 19F0074**

Prepared For:

U.S. Environmental Protection Agency
Region 7
11201 Renner Blvd.
Lenexa, Kansas 66219

June 11, 2020

Prepared By:

Tetra Tech, Inc.
415 Oak Street
Kansas City, Missouri 64106
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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division tasked the Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START), under contract number 68HE0719D0001, to prepare a remedial optimization plan pertaining to a portion of the Des Moines Trichloroethene (TCE) Superfund site owned by DICO, Inc. (DICO) to support optimization of the existing groundwater treatment system and a potential property transfer. EPA Superfund Redevelopment Initiative and Region 7 are working with the City of Des Moines, Iowa, to align redevelopment goals and cleanup actions. This initiative will ensure that EPA and its partners/stakeholders have an effective process and the necessary tools and information to return the site to productive use.

The purpose of this technical memorandum is to provide technical information and design elements for optimizing an existing remedial (pump and treat [P&T]) system. Controls for the remedial system are in a former Production Building that will be demolished. In addition, the existing 30-foot tower air stripper is over 30 years old and a 2018 Optimization Review Report recommended optimization of the system. The tower has outlived its usefulness; therefore, a replacement tray-style air stripper will be installed. Furthermore, extraction and monitoring wells will be optimized to help maximize the efficacy of the remedial system and to function with redevelopment.

2.0 BACKGROUND INFORMATION

Information regarding the site's location and description, and operational and investigative history follow:

2.1 SITE LOCATION AND DESCRIPTION

The Des Moines TCE Site is in south-central Des Moines on the east side of the Raccoon River. The Site includes a 43-acre property formerly operated by DICO. It is southwest of the intersection of W. Martin Luther King Jr. Parkway and SW 16th Street in Des Moines, Polk County, Iowa. The site is in Section 8, Township 78 North, Range 42 West. Geographic coordinates at the approximate center of the site are 41.579293 degrees (°) North latitude and 93.638964° West longitude (see Appendix A, Figure 1).

The DICO property includes the Office Building, Production Building, and Buildings 1, 2, and 3; and slab foundations remaining from the Maintenance Building and Buildings 4 and 5. A surface water feature at the south end of the site is referred to as the "South Pond Area" (see Appendix A, Figure 2).

Surface water across the site generally drains from north to south. Surface water also collects in the South Pond Area and overflows into the east drainage ditch. The southern portion of the site is within the Raccoon River flood plain (Federal Emergency Management Agency [FEMA] 1987). The South Pond Area is a wetland (U.S. Fish and Wildlife Service [USFWS] 2016).

Site geology consists of about 50 feet of alluvial sands and gravel, underlain by about 500 feet of shale and limestone. However, the soil profile on the site has been altered by use of fill material to raise the elevation above flood elevations. The saturated zone begins at about 20 feet below ground surface (bgs). Natural groundwater flow direction at the site follows regional groundwater flow patterns, paralleling the Raccoon River toward the south-southeast.

2.2 SITE OPERATIONAL HISTORY

For approximately 40 years, the DICO property hosted a variety of industrial uses/operations that included steel wheel manufacturing, chemical and herbicide distribution, and pesticide formulation processes. Supporting these activities were a grey iron foundry and a steel wheels manufacturing plant. Released hazardous substances during DICO's operations at the site included the following: TCE, 1,2-dichloroethene (DCE), and vinyl chloride to groundwater; residual pesticides and metals to shallow soils; and pesticides within buildings to soils on the southern end of the property, and within drainage areas. The site has been divided into four operable units (OU):

- OU 1 – groundwater TCE plume on the site
- OU 2 – originated as source soils associated with TCE groundwater contamination, but later focused on residual pesticides and metals in shallow soils
- OU 3 – a source area of tetrachloroethene (PCE) groundwater contamination north of the DICO property
- OU 4 – pesticides in buildings, in soil on the southern end of the site (a.k.a., South Pond Area), and in drainage areas of the site.

A groundwater P&T system has operated at the site since 1987. Since that time, the groundwater plume has been effectively contained on the site. Currently, three extraction wells and an air stripper are in operation (Appendix A, Figure 3). DICO continues to operate and maintain the groundwater P&T system.

The Des Moines Water Works (DMWW), which supplies potable water to the City of Des Moines, is immediately across the Raccoon River west of the site. The design objective for the on-site groundwater extraction system is to prevent TCE-impacted groundwater from threatening the public water supply by preventing its migration to the west side of the Raccoon River and entering the DMWW infiltration gallery. In addition, without proper capture of contaminated groundwater, off-site migration may occur to the east, southeast, or south depending on the stage of the Raccoon River.

2.3 SUMMARY OF RECENT GROUNDWATER CONTAMINATION

Historically, TCE detected in groundwater on site and within the northern portion of the DMWW gallery west of the site have driven risk management decisions at the site. In 1984, the City discontinued use of the north portion of the gallery, and in 1987, on-site pumping resulted in capture of contaminants to

prevent their off-site migration to the west. TCE concentrations exceeding the Maximum Contaminant Level (MCL) of 5 micrograms per liter ($\mu\text{g/L}$) have diminished west of the site (EPA 2018b).

According to GHD (2018), during sampling in May 2018, TCE was detected above the MCL of 5 $\mu\text{g/L}$ at extraction and recovery wells (ERW)-5, -6, -7; NW-7; and NW-22 (Appendix A, Figure 3).

Concentrations of *cis*-1,2-DCE exceeded the MCL of 70 $\mu\text{g/L}$ at U-4, and vinyl chloride was detected, but below its MCL of 2 $\mu\text{g/L}$ at two monitoring wells—U-4 and EW-5 (Appendix A, Figure 4). Analyte concentrations at all other sampled locations were below MCLs or not detected.

GHD also showed that natural degradation is occurring through reductive dechlorination, as evidenced by presence of the TCE daughter products *cis*-1,2-DCE and vinyl chloride. Natural microorganisms that degrade TCE are present, but populations of these are not sufficient to degrade concentrations of TCE without enhancement. Furthermore, reducing conditions are present for reductive dechlorination at some but not all areas of the site (GHD 2018).

However, HydroGeologic, Inc. (HGL) noted that extraction wells ERW-6 and -7 occasionally exhibit slugs of TCE higher than what is detected when these remedy wells are shut off for several days and sampled. In one case, a TCE concentration of 1,520 $\mu\text{g/L}$ was detected in February 2015 (EPA 2018b).

These data indicate continuing capture of chlorinated volatile organic compounds (CVOCs), limitation in off-site migration of CVOCs, and occurrence of biodegradation of CVOCs via reductive dechlorination. However, it is also likely that TCE and daughter products exist at much higher concentrations east of ERW-6 and -7, probably near the former degreaser vat, or at other potential sources. TCE may be stored in fine-grained deposits or in pools at junctions of hydraulic conductivity variations. Further, the current P&T system could have limited effectiveness dealing with TCE gradually diffusing from one or more source areas.

3.0 CURRENT AND ENVISIONED USES OF THE PROPERTY

Manufacturing operations at the DICO property have discontinued. Currently, the DICO property is used only for operating and maintaining the OU1 groundwater extraction and treatment system, maintaining the asphalt cap, and maintaining the buildings pursuant to an operations and maintenance (O&M) plan for those buildings. The DICO property is fenced, and the owner provides security.

Land use within the area surrounding the site is changing. Much of this surrounding area has been rezoned. For several years, Des Moines has been planning a major redevelopment project in the River Point West area east of the site. EPA supports redevelopment of the property, and envisions a wide variety of possible uses, assuming the following: (1) the groundwater P&T system continues to operate effectively, (2) protective measures are in place to prevent exposure to contaminated soils and sediments, and (3) contamination in the remaining buildings is adequately characterized and addressed.

The City of Des Moines plans on acquiring the property for public use. Reuse goals may include the following:

- City Police Department
- Athletic facilities
- Public amenities close to downtown.

Although these reuse goals are uncertain and there are no confirmed reuse plans for the site, Tetra Tech assumes the footprints shown on Figure 5 (Appendix A) will be redeveloped and limited access will be available.

4.0 METHODOLOGY

Subsections 4.1 through 4.3 present the recommended methodology for optimizing the remedial treatment system.

4.1 REMEDIAL SYSTEM OPTIMIZATION

The following sections describe the current groundwater extraction and treatment system, specify proposed changes to recovery wells, and present a strategy for a pump test and capture zone analysis.

4.1.1 Current Groundwater Extraction and Treatment System

The design objective for the on-site P&T system is to prevent TCE-impacted groundwater from migrating to the west side of the Raccoon River, entering the DMWW infiltration gallery, and threatening the public water supply. Currently, three extraction wells (ERW-5, ERW-6, and ERW-7) are in operation. Treatment of the extracted water occurs in an air stripper tower located south of the current extraction wells, with ensuing discharge into the Raccoon River to the west.

Among the extraction and monitoring wells, highest TCE concentrations have been detected in ERW-6 and ERW-7. Over the last 5 years, TCE concentrations have typically ranged between 120 to 180 µg/L in ERW-6 and 430 to 780 µg/L in ERW-7 during their operation. In ERW-5, TCE concentrations have remained relatively low, ranging between 10 and 15 µg/L. As part of a monitored natural attenuation (MNA) evaluation in 2018, the extraction wells were turned off 5 days prior to sampling. Resulting TCE concentrations in ERW-6 and ERW-7 were lower (60 and 207 µg/L, respectively) than detected during routine operation. TCE concentration in ERW-5 (19 µg/L) remained near but slightly higher than previous detected concentrations. These results indicate that ERW-6 and ERW-7 are pulling contamination from higher concentration areas, whereas operating ERW-5 appears to exert limited influence on the system (EPA 2018c).

Additionally, increases in influent concentrations were detected in 2015 when ERW-5 and ERW-6 were shut down for maintenance, and decreases in influent concentrations were detected when ERW-6 and ERW-7 were shut down (EPA 2018a). This supports the assumption that ERW-7, located nearest to the suspected source area, exerts the greatest influence on the P&T system. Historical evaluations of the system have documented multiple maintenance shutdowns of the extraction wells, particularly ERW-6, often due to buildup in the wells.

4.1.2 Proposed Recovery Well Changes

As per recommendations from the Optimization Review completed in 2018, the remedial system would be improved by reducing groundwater extraction operation to more optimally located extraction wells. Given the consistently low concentrations detected in ERW-5, this extraction well would be shut down and abandoned or converted to a monitoring well. Extraction well ERW-7 would be connected to the new air stripper and would remain in operation.

A new extraction well (ERW-10) is proposed to replace ERW-6 in the P&T system. To optimally capture groundwater contamination via combination of this well with ERW-7, selection of this well's location would be at or near the former degreaser vat area (Appendix A, Figure 3). Installation of a new extraction well would also improve system performance by upgrading aged equipment. If it is determined that operating only ERW-7 and the new ERW-10 is sufficient to contain contamination, ERW-6 would be shut off. However, it would remain in place connected to the new air stripper as a backup due to uncertainties regarding the capture zone as discussed in Section 4.1.3. The new and existing extraction wells would be installed or modified to be below grade or, in the case of ERW-10, flush with the building pad. Costs for retrofitting the existing extraction wells versus leaving them above grade are nominal and would result in fewer operational problems, better aesthetics, and more options for site re-use.

4.1.3 Pump Test and Capture Zone Analysis

This strategy relies on expectation that ERW-10 (or ERW-10 operating with ERW-6) combined with ERW-7 would sufficiently contain contamination currently extracted by ERW-5 to continue to meet design objectives. However, the hydraulic effect of removing ERW-5 from operation has not been previously analyzed. Previous groundwater capture zone analyses have suggested a capture width of about 100 feet, with the most influence around ERW-7. Based on well gauging by GHD in 2018 with the extraction wells on and off, groundwater appears to flow east/southeast without the influence of the extraction wells. Measured drawdown was about 6 feet at ERW-7, about 4 feet at ERW-6, and about 7.5 feet at ERW-5 (GHD 2018).

Tetra Tech recommends a pump test followed by a capture zone analysis. Objectives of the pump test would be to: (1) determine yield and drawdown characteristics of the extraction wells, (2) assess radii of influence of extraction wells on the surrounding water table, (3) understand likely efficacy of the extraction wells in intercepting the known plume of chlorinated solvents, and 4) obtain hydraulic data for groundwater and capture-zone modeling. Results obtained from the pump test would support an ensuing

capture zone analysis to confirm that the modified extraction treatment system would sufficiently contain contamination and continue to meet design objectives.

4.2 MONITORING WELL PLAN

Recommendations for changes to the existing monitoring well network derive from findings and sampling data from an MNA evaluation by GHD in 2018, and from a 2017 groundwater treatment system performance evaluation by Fehr Graham Engineering & Environmental (Fehr Graham).

As part of the MNA evaluation in 2018, GHD, on behalf of DICO, Inc., conducted an inspection and evaluation of all monitoring wells associated with the site. During the monitoring well network inspection, several new unmapped wells were documented, and numerous wells were sampled for volatile organic compounds (VOC) and several MNA parameters (GHD 2018). Observations by GHD during its monitoring well investigations are summarized in Table 1, and the current monitoring well network is shown on Figure 4 (Appendix A).

The 2018 well inspection identified three previously unmapped monitoring wells that appeared to be damaged or improperly abandoned. The wells, identified as U-2, U-5, and U-6, were immediately west of the production building. U-2's stick-up casing was bent over at ground surface. Wells U-5 and U-6 were accessed and gauged, revealing total depth of just over 3 feet below the top of casing. These wells may have been partially or improperly abandoned. Based on close proximity to other usable monitoring wells, these wells do not appear critical for plume delineation or monitoring. Tetra Tech recommends proper abandonment of these three wells.

Several other wells had undergone damage that should be addressed. A bailer was lodged in the well casing of monitoring well P-9, and wells NW-24 and P-13 appeared to have broken well lids. Unclear from the inspection documentation is whether the surface completions for these wells are the stick-up variety or flush-mount vaults. Tetra Tech recommends repair of these three monitoring wells and return of them to usable condition.

Based on monitoring well sampling data obtained in 2016 by Fehr Graham and in 2018 by GHD, five monitoring wells have not yielded detections of site contaminants TCE or DCE within the last 5 years (Fehr Graham 2017, GHD 2018). Most of these five "clean" monitoring wells are in areas important for delineating extent of the plume and should be maintained. However, one monitoring well, NW-25, appears to be superfluous and could be abandoned without detrimental effect on overall plume monitoring. Several other monitoring wells (14) identified by GHD appeared to be in usable condition

but have not been sampled within the last 5 years. Tetra Tech recommends maintaining these wells until they can be sampled, with results applied to determine their usefulness in plume monitoring.

To summarize, Tetra Tech recommends abandonment of three monitoring wells that are damaged and no longer usable (U-2, -5, and -6), and abandonment of one monitoring well not necessary for plume monitoring (NW-25). Tetra Tech also recommends repair of monitoring wells NW-24, P-9, and P-13, and their return to service for plume monitoring. Figure 6 in Appendix A shows the monitoring wells recommended for removal or repairs. Additional monitoring wells may be warranted to better delineate the plume area; however, because only sporadic sampling data have been acquired in recent years, more information is necessary to support further recommendations—for this, additional site characterization work and a complete sampling event could suffice.

TABLE 1**2018 MONITORING WELL NETWORK INSPECTION OBSERVATIONS**

Well ID	Well Material	Surface Completion	Top of Casing Elevation (feet)	Measured Total Depth (feet)	Inspection Notes	TCE/DCE Detected in last 5 years	Recommendation
EW-5	2" PVC	Stick-up	803.41	45.40	Locked	Yes	Maintain
EW-6	2" PVC	Stick-up	799.55	32.85	Locked	Yes	Maintain
EW-19	2" PVC	Stick-up	800.42	26.85	Locked	Yes	Maintain
MH-N	2" Steel	Flush-mount	796.58	15.40	Locked	Yes	Maintain
MH-S	2" Steel	Flush-mount	796.56	20.40	Locked	Not Sampled	Maintain
NW-1	Unknown	Flush-mount	803.55	NA	Not located in Central Campus parking lot	No	Maintain
NW-2	3" BPA	Stick-up	806.69	46.35	8" threaded steel casing, locked	Yes	Maintain
NW-4	3" BPA	Stick-up	803.30	30.05	6" threaded steel casing	Not Sampled	Maintain
NW-6	3" BPA	Stick-up	803.20	38.10	6" threaded steel casing	No Sampled	Maintain
NW-7	3" BPA	Stick-up	800.80	31.45	8" threaded steel casing, locked	Yes	Maintain
NW-8	3" BPA	Stick-up	793.89	36.94	6" threaded steel casing	Yes	Maintain
NW-9	2" PVC	Stick-up	794.52	26.95	No lock	Yes	Maintain
NW-10	3" BPA	Stick-up	793.09	27.00	8" threaded steel casing	No	Maintain
NW-12	3" BPA	Stick-up	805.10	46.80	8" threaded steel casing, locked	Not Sampled	Maintain
NW-14	3" BPA	Stick-up	794.5	32.05	8" threaded steel casing	No	Maintain
NW-15	2" PVC	Stick-up	795.46	21.75	No lock	No	Maintain
NW-18	Unknown	Unknown	Unknown	Unknown	No information provided	Not Sampled	Maintain
NW-19	3" BPA	Stick-up	799.97	42.26	8" threaded steel casing	Yes	Maintain
NW-20	3" BPA	Stick-up	797.00	37.06	6" threaded steel casing	Yes	Maintain
NW-22	2" PVC	Not reported	799.89	45.75	Locked	Yes	Maintain
NW-23	2" PVC	Not reported	802.20	44.70	Locked	Yes	Maintain
NW-24	2" PVC	Flush-mount	797.63	37.73	Locked, broken lid	Yes	Maintain, repair lid
NW-25	2" PVC	Not reported	796.40	34.25	No lock	No	Remove/Abandon
NW-27	2" PVC	Not reported	802.57	42.05	No lock	Yes	Maintain
NW-29	2" PVC	Not reported	Not reported	46.80	Locked, incorrectly mapped	Not Sampled	Maintain
2A	3" metal	Not reported	Not reported	NA	Not previously mapped, labeled "2A"	Not Sampled	Maintain

TABLE 1 (Continued)

2018 MONITORING WELL NETWORK INSPECTION OBSERVATIONS

Well ID	Well Material	Surface Completion	Top of Casing Elevation (feet)	Measured Total Depth (feet)	Inspection Notes	TCE/DCE Detected in last 5 years	Recommendation
P-1	2" BPA	Stick-up	804.10	37.75	4" threaded steel casing	Yes	Maintain
P-2	2" PVC	Stick-up	800.52	42.32	Locked, Labeled "P-2"	Not Sampled	Maintain
P-4	2" PVC	Stick-up	795.17	31.70	No lock	Not Sampled	Maintain
P-9	2" BPA	Stick-up	792.17	NA	4" threaded steel casing, bailer stuck in well	Yes	Maintain, Repair/Replace
P-13	2" PVC	Flush-mount	793.08	24.40	Broken lid	Not Sampled	Maintain, Repair lid
P-18	2" PVC	Stick-up	802.64	41.20	Locked	Not Sampled	Maintain
U-1	2" PVC	Not reported	Not reported	16.90	Not mapped, nested with NW-7, possibly damaged EW-7	Not Sampled	Maintain
U-2	2" PVC	Not reported	Not reported	NA	Not mapped, casing bent at ground surface	Not Sampled	Remove/Abandon
U-3	2" PVC	Not reported	Not reported	14.20	Not mapped, south of Maintenance bldg., replaced lock	Not Sampled	Maintain
U-4	2" PVC	Not reported	Not reported	44.82	Not mapped, replaced lock	Yes	Maintain
U-5	2" PVC	Flush-mount	Not reported	3.05	Not mapped, damaged or partially abandoned	Not Sampled	Remove/Abandon
U-6	4" PVC	Flush-mount	Not reported	3.15	Not mapped, damaged or partially abandoned	Not Sampled	Remove/Abandon
UP-2	6" PVC	Flush-mount	789.79	34.65	Located where P-2 is shown on maps, in small parking entrance	Not Sampled	Maintain

Notes:

- " Inches
- BPA Bisphenol-A Epoxy Resin cured with Lindride anhydrides
- DCE Dichloroethene
- ID Identification
- NA Not available
- PVC Polyvinyl chloride
- TCE Trichloroethene

4.3 TREATMENT SYSTEM

The following sections dealing with the treatment system address the air stripper, extraction wells, extraction well wellheads, extraction well pumps, the pump drop pipe, conveyance piping, air stripper system influent manifolds, the air stripper, air stripper discharge, system discharge, secondary containment and sump pump, the air stripper building, and potential scaling issues.

4.3.1 Air Stripper

Recommendations in the 2018 Optimization Study regarding the existing air stripper are valid. The existing air stripper is nearing the end of its useful life. A new air stripper will provide higher quality effluent and lower electrical consumption.

Tetra Tech recommends replacing the air stripper and the extraction well system (with the exception of ERW-10). The control system that operates the pumps is likely nearing the end of its useful life, and because of its age, it is unreliable and expensive to repair, as many of the electronic components are no longer manufactured. It is also recommended that the new system be installed before the old system (including the Production building) is demolished.

The new extraction well and air stripper system would be automatically operated by a programmable logic controller (PLC), a highly reliable industrial computer that continually monitors system operations and will automatically shut down the system before equipment is damaged or before untreated or partially treated water is released. This PLC-controlled, fail-safe shutdown interlock is called the I-100 interlock in the following sections. During an I-100 system shutdown, all three well pumps would be immediately shut down to reduce potential for a release of VOC-contaminated groundwater to Raccoon River.

A human/machine interface (HMI) would be a touchscreen panel inside the air stripper building. System O&M personnel would use the HMI to monitor system performance. The HMI would be able to log all system flow rates, extraction well water levels, and air stripper functions. This data-logged information would assist in system troubleshooting and preparation of annual O&M reports. The HMI would be internet-enabled to allow remote, password-protected access by O&M personnel. The internet connection for the HMI would be either via cellular network or an internet service provider such as cable or digital subscriber line (DSL). The HMI would send text messages of all system alarms to a pre-programmed list of O&M personnel.

Essentially, the new air stripping system would consist of three extraction wells ERW-6, ERW-7, and ERW-10, with the intent to pump from ERW-7 and ERW-10 as long as capture is maintained. ERW-6 would serve as a backup and could be used before ERW-10 is put into service. The system would be designed to pump directly into a tray type air stripper, where VOCs would be removed from the water and discharged to the atmosphere. Treated water would flow by gravity through the existing discharge piping to the existing outfall on the Raccoon River.

The following sections provide further detail of system components and instrumentation. A piping and instrumentation diagram (P&ID) showing the conceptual proposed system design is in Appendix B.

An experienced water treatment system fabricator would shop-fabricate the complete system. The system would be tested at the factory and confirmed to be in proper working condition before shipment and installation on site, minimizing system startup delays.

4.3.2 Extraction Wells

For the purpose of this technical memorandum, assumptions are that the P&T system would initially continue to extract from existing wells ERW-6 and ERW-7, and that a third source-zone reduction well (ERW-10) would be installed on the western side of the Production building, near the former degreaser vat. ERW-6 would later be shut down if results of a pump test and capture zone analysis indicate operation of the well is not needed to meet design objectives.

Table 2 lists details of the two existing extraction wells ERW-6 and ERW-7 slated for continued use, and the proposed new extraction well ERW-10. Based on historical site usage, the location of ERW-10 would be near the former degreaser vat.

TABLE 2**EXISTING AND PROPOSED EXTRACTION WELL CONSTRUCTION INFORMATION**

	ERW-6 (existing)	ERW-7 (existing)	ERW-10
Installation date	June 24, 1987	June 16, 1987	TBD
Borehole diameter	48 inches	48 inches	12 inches
Well diameter	12 inches	12 inches	6 inches (with adjacent 1-inch piezometer in same borehole)
Well casing	3/8-inch-thick steel, welded	3/8-inch thick steel, welded	Schedule 40 PVC
Well screen	Stainless steel, welded (slot size not available)	Stainless steel, welded (slot size not available)	Schedule 40 PVC, wire wrapped
Screen length	7 feet	7 feet	15 feet
Top of screen	36.5 ft bgs	41.95 ft bgs	34 ft bgs (TBD)
Bottom of screen	43.5 ft bgs	48.95 ft bgs	49 ft bgs (TBD)
Top of gravel pack	22 ft bgs	18.5 ft bgs	24 ft bgs (TBD)
Bottom of gravel pack	48.5 ft bgs	49.5 ft bgs	49.5 ft bgs (TBD)
Total depth (ft bgs)	48.5 ft bgs	49.5 ft bgs	49.5 ft bgs (TBD)

Notes:

ft bgs Feet below ground surface

PVC Polyvinyl chloride

TBD To be determined; exact depths and lengths may be field modified by the site hydrogeologist

According to site documents, ERW-6 and ERW-7 may require periodic redevelopment and disinfection but are still usable extraction wells for the new P&T system.

The new extraction well, ERW-10, is proposed to be a 6-inch-diameter well in a 12-inch borehole. A 1-inch-diameter piezometer would be installed immediately adjacent to the 6-inch well, in the same borehole and used to house the pressure transducer. The ERW-10 well would be schedule 40 polyvinyl chloride (PVC) with flush-threaded joints. The well screen would be a PVC, wire-wrapped screen with inwardly widening slots to reduce potential for screen clogging by particulates. The well screen slot size and sand pack mesh size for ERW-10 would be finalized using existing site information.

4.3.3 Extraction Well Wellheads

The proposed wellheads would be underground flush-mounted, traffic-rated vaults or could remain aboveground completions for the existing wells (ERW-6 and ERW-7). However, below-ground completions are recommended to reduce operational problems and provide flexibility for site re-use. Furthermore, the cost difference is nominal. Each vault would be approximately 18 inches in diameter, with a bolt-down traffic rated lid. Underground wellheads would be less obtrusive, more secure, and less prone to freezing than the current aboveground wellheads. The underground wellheads would allow unfettered development on the property.

At existing wells ERW-6 and ERW-7, a 3-inch threaded pitless adapter would be welded to the side of the casing at 5 feet bgs. The pitless adapter would be used to transition the vertical pump discharge drop pipe to the horizontal conveyance pipe. The pitless adapter would also support the submersible pump and drop pipe, and allow a well maintenance company to remove and replace the pump for well re-development and disinfection. The 12-inch casing would be cut off approximately at 1-foot bgs to convert the well to an underground flush-mounted completion.

4.3.4 Extraction Well Pumps

The extraction well pumps (P-ERW-6, P-ERW-7, and P-ERW-10) would be submersible pumps. Pump size and flow rate would be finalized based on groundwater modeling results, but the pumps are anticipated to be approximately 3-horsepower (hp), capable of pumping 85 gallons per minute (gpm) at 78 feet of head. The submersible pumps would be equipped with pump shrouds that force incoming groundwater to flow past the pump motor, cooling the motor and extending motor life.

The pumps likely would have a 3-inch-diameter discharge pipe and an integral check valve to prevent backflow into the well.

Each pump would be suspended by a 3-inch drop pipe, and would also be connected to a ¼-inch stainless steel cable connected to an eye-bolt at the top of the well in case the drop pipe or pitless adapter fails. A gasketed sanitary well seal on top of the well would allow the pump power cable and pressure transducer to pass through the seal and down the well.

The pumps would likely be 480-volt, 3-phase, and be connected to a variable frequency drive (VFD) located at the treatment system. A pressure transducer (PT-ERW-6, PT-ERW-7, or PT-ERW-10) installed in the adjacent piezometer would send a 4- to 20-milliamp (mA) signal to the PLC to indicate the water level in the extraction well. The PLC would increase or decrease the pump speed as necessary to achieve the desired drawdown in the well. Use of a VFD, instead of throttling, would allow the pump to run only at the necessary speed to achieve the desired drawdown, reducing electrical consumption. The VFD also would include motor soft-start capability, to reduce torque on the drop pipe and minimize potential water-hammer issues. The VFD would also include a motor fault alarm (YA-ERW6, YA-ERW7, or YA-ERW10) alerting O&M personnel of any issues with the pump motor.

If water level decreases to 1 foot above a pump, a level alarm low (LAL-ERW-6, LAL-ERW-7, or LAL-ERW-10) would activate and shut off the pump before it runs dry, possibly damaging the pump.

During an I-100 system shutdown, all three extraction well pumps (P-ERW-6, P-ERW-7, and P-ERW-10) would immediately stop pumping.

4.3.5 Pump Drop Pipe

The pump drop pipe would likely be 3-inch-diameter, schedule 80 PVC drop pipe specifically designed for drop pipe use, and to support the weight of the pump and resist pump torque. PVC drop pipe has splined fittings that are easier to remove than threaded fittings to allow easier pump removal and re-installation during well redevelopment and disinfection.

4.3.6 Conveyance Piping

Each well would be connected to the air stripper via an individual 3-inch-diameter, high-density polyethylene (HDPE) pipe. HDPE is inexpensive, easy to install, and very durable. It is joined by heat-butt fusion, where the ends of the pipe are heated to the proper temperature by a fusion machine and then butted together and allowed to cool, creating a joint stronger than the adjacent pipe. Butt-fused HDPE pipe also does not require thrust blocks at pipe elbows. HDPE pipe with a standard dimensional ratio (SDR) of 17 and rated for 160 pounds per square inch (psi) should be sufficient (and below the maximum extraction well pump pressure).

To prevent freezing, the conveyance piping would be installed at 5 feet bgs, the standard pipe burial depth for Des Moines (Des Moines Water Works 2013).

Pipe lengths are approximately 900 feet from ERW-6, 600 feet from ERW-7, and 825 feet from ERW-10. Having individual pipes for each of the three wells instead of a common pipe would allow installation at the treatment system of flow meters and sample ports from each well. Nominal cost of the extra individual well piping would likely be outweighed by the following:

1. Reduced O&M costs of individual well sample collections at the treatment system building. If the individual well sample ports would be located at the respective wellheads, installation of those sample ports would have to occur below the 5-foot-bgs frost depth, likely requiring each of those installations in a permit-required confined space vault.
2. With a combined pipe system, placements of the individual well flowmeters would have to occur at the wellheads, at 5 feet bgs, requiring much larger well vaults than a permit-required confined space.

Piping from each extraction well would be 3-inch-diameter HDPE pipe. For the 900-linear foot pipe run from ERW-6 and design pumping rate of 83 gpm, head loss through the pipe (including fittings, valves, and drop pipe in the well) would be approximately 17.6 feet of head (or 0.66 psi per hundred lineal feet).

Water velocity in the pipe would be 3.62 feet per second (ft/s), within the desired range of 2 to 5 ft/s, preventing settlement of particulate matter and minimizing water hammer issues.

Placement of each of the three extraction well pipes would likely occur in a 5-foot-deep, 2.5-foot-wide trench. According to the ERW-6 and ERW-7 well logs, soil from 1 to 8 feet bgs consists of landfill debris, including bricks, rock, steel, and bottles (Layne Western Company, Inc. [Layne] 1987a, b).

To minimize potential for pipe damage, the piping would be bedded in a 1-foot-thick layer of sand or pea gravel at the bottom of the trench. Electrical and instrumentation conduit would be placed in the same trench, at depth of at least 24 inches bgs.

Excavation of trenches for piping should include waste characterization and potential disposal of some excavated material in a hazardous waste landfill. Excavated material should be stored onsite and properly characterized before reuse or disposal offsite. Furthermore, the existing asphalt cap is part of the remedy specified in the Record of Decision; therefore, any disturbance such as trenching must include replacement of the asphalt cap. If possible, it may be more cost-effective to install the piping, instrumentation, and electrical conduit by horizontal borings. The construction contract could be written to allow the contractor to choose either method.

The three 3-inch HDPE pipes will stub up under and into the air stripper building. The piping will then transition from 3-inch HDPE, best suited for long piping runs, to 3-inch, schedule 80 PVC, better suited for addition of instrumentation, valves, and other appurtenances.

4.3.7 Air Stripper System Influent Manifold

Each of the three wells would have a separate instrumentation manifold inside the building.

On each leg of the 3-inch, schedule 80 PVC pipe manifold would be a sample port (SP-ERW-6, SP-ERW-7, or SP-ERW-10), which would allow sample collection from each of the three extraction wells without need to access the well.

A pressure transmitter (PIT-ERW-6, PIT-ERW-7, or PIT-ERW-10) would measure incoming water pressure from each well.

A magnetic flowmeter and totalizer (FIT/FIQ-ERW-6, FIT/FIQ-ERW-7, FIT/FIQ-ERW-10) would measure and record the flow rate from each well. The PLC would calculate and total the system flow rate, and display this information on the HMI. Although magnetic flowmeters are more expensive than other types of flowmeters, they have no moving parts and require very little if any maintenance.

After the flow meter would be a check valve and a ball valve to prevent backflow toward the well.

Influent from all three wells would combine in a 4-inch, schedule 80 PVC manifold. A sample port, SP-INF, would be installed on this pipe and allow the operator to collect a combined sample of the air stripper influent.

4.3.8 Air Stripper

The air stripper (AS-101) would be a low-profile, tray air stripper with a water flow capacity of 250 gpm. Tray air strippers have largely replaced packed tower air strippers because they are lower profile, easier to maintain, less prone to fouling, more efficient, and quieter. The removable, stainless steel trays would be easy to clean via pressure washing. Windows on the side of the air stripper would allow O&M personnel to visually monitor for signs of tray scaling or biofouling.

The air stripper functions by blowing air into the bottom of the unit and water at the top. The air travels upward through perforations in each tray. Water flows across each tray—the high air flow prevents the water from flowing downward through the perforations. The high air-to-water ratio created by the air stripper causes VOCs such as TCE and *cis*-1,2-DCE to partition from the dissolved phase to the vapor phase. After crossing one tray, the water flows down to the next tray below, and eventually into the air stripper sump. Air flows up through all the trays, through a de-mister to remove water, and is discharged out an 8-inch-diameter stack on top of the building. The stack height would be a minimum 16 feet above the surrounding ground surface to increase air dispersion.

Sufficient residence time in the air stripper would be achieved by adding air stripper trays. A 6-tray stripper likely would be needed to achieve CVOC concentrations below detection limits in treated water effluent leaving the air stripper. Concentrations of VOCs in the new source zone extraction well, ERW-10, are not yet known, but are anticipated to be higher than concentrations in ERW-5. Therefore, assumptions of influent contamination concentrations were conservative. Presuming a maximum flow rate of 250 gpm, and conservative influent concentrations of 750 µg/L TCE and 150 µg/L *cis*-1,2-DCE, a six-tray air stripper would remove enough of both contaminants so as to leave CVOC concentrations of 1 µg/L, and likely below 0.5 µg/L detection limits in the treated water effluent (see Appendix B). The existing treated water effluent contains average TCE concentrations above 5 µg/L, and thus the new air stripper would significantly decrease treated water effluent concentrations.

Inlet air to the blower would be ducted from outside the building and flow through an air filter (F-100) to prevent dust or debris from entering the blower and air stripper. A sheet metal shroud—open on the

bottom—would be placed over the air inlet filter to prevent accumulation of snow or freezing rain on the air filter inlet.

A centrifugal blower (B-100) would provide 1,300 cubic feet per minute of air flow through the air stripper. The blower would be powered by a 15-hp, 480-volt, 3-phase direct drive motor.

A pressure gauge (PI-100) on the blower inlet would measure blower inlet vacuum and help identify when the inlet filter (F-100) is becoming clogged and requires a changeout.

A VFD (SC-100) would allow adjustment of blower speed to generate an air flow rate proportional to the water flow rate in order to maintain the necessary air/water ratio for removal of VOCs. Thus, speed of the blower motor would be based on total influent flow rate from ERW-6, ERW-7, and ERW-10. If the influent water flow decreases, the blower speed could be decreased to achieve the target air/water ratio and the same level of treatment. This reduced blower motor speed would reduce electrical consumption. The blower air flow rate would be measured by a thermal dispersion air flow meter (FIT-100). The PLC would continually monitor and adjust the blower speed as necessary. If an air stripper air flow rate sufficient to meet the target air/water ratio cannot be achieved, a flow alarm low (FAL-100) would be activated and initiate the I-100 system shutdown.

A pressure transmitter (PIT-100) would measure and transmit the blower discharge pressure to the PLC. Detection of low pressure (likely caused by a blower failure, clogged inlet filter, or pipe break) would activate a pressure alarm low (PAL-100) and initiate the I-100 interlock system shutdown process.

A high-pressure condition (likely caused by a pipe blockage or clogged air stripper trays) would activate a pressure alarm high (PAH-100) and activate the I-100 system shutdown.

During an I-100 system shutdown, the air stripper blower would continue to run for 5 minutes to fully treat the water in the air stripper before it is discharged.

4.3.9 Air Stripper Discharge

Treated water from the air stripper trays would eventually flow down into the air stripper sump. A sight glass level gauge (LG-101) would allow O&M personnel a visual indication of the water level in the sump. Additionally, a level transmitter (LT-101) in the sump would measure the sump water level. If a blockage were to occur in the discharge pipe and the water level in the sump would rise above the alarm setpoint, a high level alarm (LAH-101) would activate and initiate the I-100 system shutdown.

From the air stripper sump, the water would flow through a 6-inch discharge pipe on which a system effluent sample port (SP-EFF) would be installed. This pipe would be connected to a small (30-gallon), stainless steel, gravity discharge tank (T-102) containing an overflow weir so that the air stripper discharge piping would always be full of water, thus preventing the air flow from short circuiting out the air stripper sump instead of proceeding through the trays and out the stack.

4.3.10 System Discharge

The treated water effluent would discharge from the T-102 discharge tank by gravity to the existing discharge pipe. Flow through this pipe is westward for approximately 450 feet to the National Pollutant Discharge Elimination System (NPDES)-permitted outfall, where it discharges into the Raccoon River. Field inspection and evaluation of size, material, and condition of this piping would be necessary to confirm its suitability for use by the new air stripper.

Utilization of the existing pipe would reduce construction cost and avoid potential permitting issues with construction of a new pipe through the flood-control levee along the western border of the property.

4.3.11 Secondary Containment and Sump Pump

The floor of the building would be steel-coated with a rust-resistant, slip-resistant, spray-applied coating, similar to a spray-on truck bed liner. A 2-inch-tall steel dike around the floor of the building would provide secondary containment. The floor would drain to a sump. The floor and sump would have a total secondary containment volume of more than 250 gallons to capture any spills or leak.

A small 1/3-hp submersible sump pump (P-103) would pump water that collected in the sump to the air stripper for treatment and discharge. A level transmitter (LIC-103) would turn on the sump pump when the sump is full, and would turn off the pump when the sump is near empty. During each sump pump activation, a high-level alarm (LAH-103) would be sent to O&M personnel to notify them of a potential system leak that should be investigated.

The level transmitter would activate a high-level alarm (LAHH-103) and initiate an I-100 system shutdown when the secondary containment is within 1 inch of the top of the secondary containment.

4.3.12 Air Stripper Building

The air stripper system would be housed in a single, 12-foot-wide, 20-foot-long, 12-foot-tall building on a steel frame. The system would be anchored to a 13- by 21-foot level concrete pad to resist seismic and wind loads.

The air stripper building would have low-maintenance, factory-finished metal roofing and siding with a 25-year guarantee against rust and need for re-painting. A locking single door would provide personnel access to the building. Locking double doors near the air stripper would allow entry or exit of larger equipment into or out of the building, if necessary. The building would be insulated to R-13.

A thermostat-controlled heater would maintain an indoor temperature above 55 degrees Fahrenheit to prevent freezing of the piping. During hot summer days, constant flow of cool groundwater would maintain a low temperature in the building, rendering air conditioning unnecessary. A louvered fan and vent on opposite sides of the building would provide ventilation.

4.3.13 Potential Scaling Issues

A review of available system operating data indicated apparent possibility of scaling and biofouling of the air stripper media, which would require occasional O&M. This is common in air stripping systems that remove dissolved carbon dioxide from water, increasing pH and causing precipitation or scale formation. Based on available documents, the existing system does not induce any pH adjustment or use polyphosphate antiscalant to control scaling, or utilize any disinfectant to control biofouling.

Tray-type air strippers generally are more resistant to scale formation and biofouling than tower air strippers. The proposed air stripper has trays one person can easily remove and clean by pressure washing. The removed scale is typically a nonhazardous waste consisting of calcium carbonate, iron oxides, and other precipitates. A spare set of trays can be purchased and used during tray cleaning to minimize system downtime.

Nevertheless, a more thorough evaluation of potential for scaling would need to be completed so that appropriate antiscalant measures could be incorporated into the system, if needed.

5.0 SUMMARY OF DESIGN ELEMENT ASSUMPTIONS

Design element assumptions are as follows:

1. Well development purge water from the new extraction well would be containerized in a frac tank before proceeding through the air stripper.
2. The design approach was based on recommendations in the Optimization Review Report Remedial Process Optimization Study (EPA 2018b).
3. Certain activities, such as construction of the new air stripper, controls, and conveyance to ERW-6 and -7 should occur before building demolition; however, demolition of the Production Building before construction and implementation of ERW-10 is assumed.
4. Future redevelopment of the property would be similar to that presented in the Des Moines TCE Site Redevelopment Assessment (EPA 2018c). Location of the new treatment system would be on the south/southwest edge of the property to avoid potential redevelopment zones.
5. Location of the new extraction well (ERW-10) is expected to be at or near the former degreaser vat area approximately 225 feet east of ERW-7. The assumed specifications are a 6-inch well, 49 feet bgs total well depth, 15-foot screen interval, and a traffic-rated well vault completion. Exact depth and other details may be field-selected by a hydrogeologist, based on field observations.
6. The production building foundation would remain in place requiring concrete saw cutting, demolition, and disposal. The foundation is assumed to be 12-inches thick.
7. The new treatment system would continue to discharge to the Racoon River under an NPDES permit requiring 95 percent contaminant reduction, consistent with the current treatment system.
8. The existing discharge pipe is intact and in good condition for re-use.
9. The existing flow rate of 180-gpm provides hydraulic control. The new system could pump at a maximum of 250-gpm; however, groundwater modeling or an extensive capture zone analysis must be completed to confirm that this maximum flow rate is enough.
10. Air stripping alone is sufficient to treat groundwater contamination. SVOCs (and potentially other contaminants such as PCBs, pesticides, herbicides, or metals) are not an issue in groundwater and will not require treatment.
11. No pH adjustment or antiscalant is needed to reduce scaling of the new air stripper.

12. Electrical distribution to the new air stripper and extraction wells assume that a new electrical service line would need to be established. It is expected that when the production building is demolished, electrical connection to the current system will be lost. The new electrical service line to the treatment system would run in the same trench as the piping and then extend the conduit to the power drop location likely near the driveway entrance.
13. Semi-annual sampling is assumed consistent with the previous semi-annual sampling plan (sampling as many as 22 monitoring wells and the Raccoon River and Des Moines River), with the following exceptions:
 - a. A pneumatic bladder pump would be used instead of a peristaltic pump.
 - b. Water quality parameters would be recorded during sampling.
 - c. Samples would be analyzed for natural attenuation parameters such as ferrous iron, nitrate, sulfate, and alkalinity.
14. Well logs from the area trenching indicate possible presence of debris at some locations as deep as 9 feet bgs; therefore, only approximately 80% of excavated soil from trenching is assumed suitable as backfill. The remaining 20% of fill would be clean sand brought in from off site and placed from 4 to 5 feet bgs as pipe bedding. Note that excavated soil or fill material will need to be characterized before disposal off-site.

Uncertainties that could require additional design elements are described below.

1. It is recommended that construction of the new air stripper, controls, and conveyance to ERW-6 and -7 occur before building demolition to minimize the amount of time without groundwater treatment. The existing system cannot be operated after demolition of the building because electrical controls for the existing air stripper are housed in the Production building unless temporary electrical distribution is established. Options for containing the groundwater contamination during construction are as follows:
 - a. Install the new system prior to demolition of the Production building and the old system—this is preferable as it requires no additional design considerations and associated costs.
 - b. The existing air stripper and pumps could be shut down until a new system is installed. Modeling could use particle tracking to see how much contaminant mass escapes the capture zone during the shutdown. The new system could be operated at 250-gpm (instead of the existing 180-gpm) with a presumably larger capture zone to re-capture any escaped contaminant mass. Modeling would be necessary to determine if this is feasible.
 - c. Temporary electrical distribution could be established but would be costly. Electrical distribution designed for the new system cannot be utilized to operate the existing system due to the motor sizes of the existing pumps and blowers likely being different and incompatibility with aged control equipment. Therefore, new trenching and electrical connections would have to be made to a temporary control and electrical panels. This would require an additional design.

2. The site grade may change as a result of additional fill brought in during redevelopment. Additional design elements depend on how much the grade is raised.
 - a. For the extraction wells, grade could be increased up to 2 to 3 feet without necessarily having to weld on new casing, and just having the top of casing down deeper in a well vault. A new, deeper 18-inch or 24-inch well vault could be installed or the wells could be raised by welding on a carbon steel casing extension.
 - b. If the change in grade can be anticipated prior to construction of the flush-mounted wellheads for the extraction wells, then modifications to the wells could be altered to account for the change. ERW-6 and 7 appear to be 2 feet above grade (based on the drill logs), which should allow them to be used as-is unless the site grade is increased by more than about 4 feet. If the site grade is raised more than 4 feet, then it would be necessary to weld on a carbon steel casing extension.
 - c. Monitoring wells would need a solvent-weld coupling and schedule 40 PVC casing extension, new flush mount well cover, and concrete apron. The BPA wells would require epoxying a PVC coupling to the existing and then solvent welding schedule 40 casing on top of the coupling. Alternatively, a compression coupling could be used in either case. The compression fitting would avoid potential contamination issues but is not a rigid extension of the casing.
3. If the existing discharge pipe is not suitable, a new discharge pipe would need to be constructed. It could be shallower than the conveyance piping (3-ft deep, 8-inch PVC). If the pipe must go through the levee, permitting/coordination with the Army Corps of Engineers would be required.

6.0 SUMMARY AND RECOMMENDATIONS

EPA Region 7 Superfund Division tasked Tetra Tech to provide technical information for optimizing an existing remedial (P&T) system. The purpose of this Remedial Optimization Memorandum was to (1) review recent optimization and performance reports, (2) summarize and provide technical justification for extraction and monitoring wells, and (3) provide design elements for replacing the 30-foot air stripper with a newer, low-profile air stripper.

Tetra Tech reviewed recent optimization and performance reports. Assuming an impending property transfer, demolition of existing buildings, and proposed reuse, Tetra Tech recommends the following:

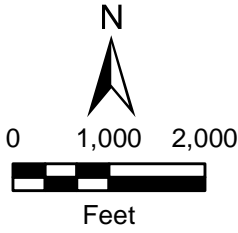
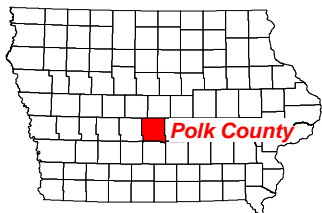
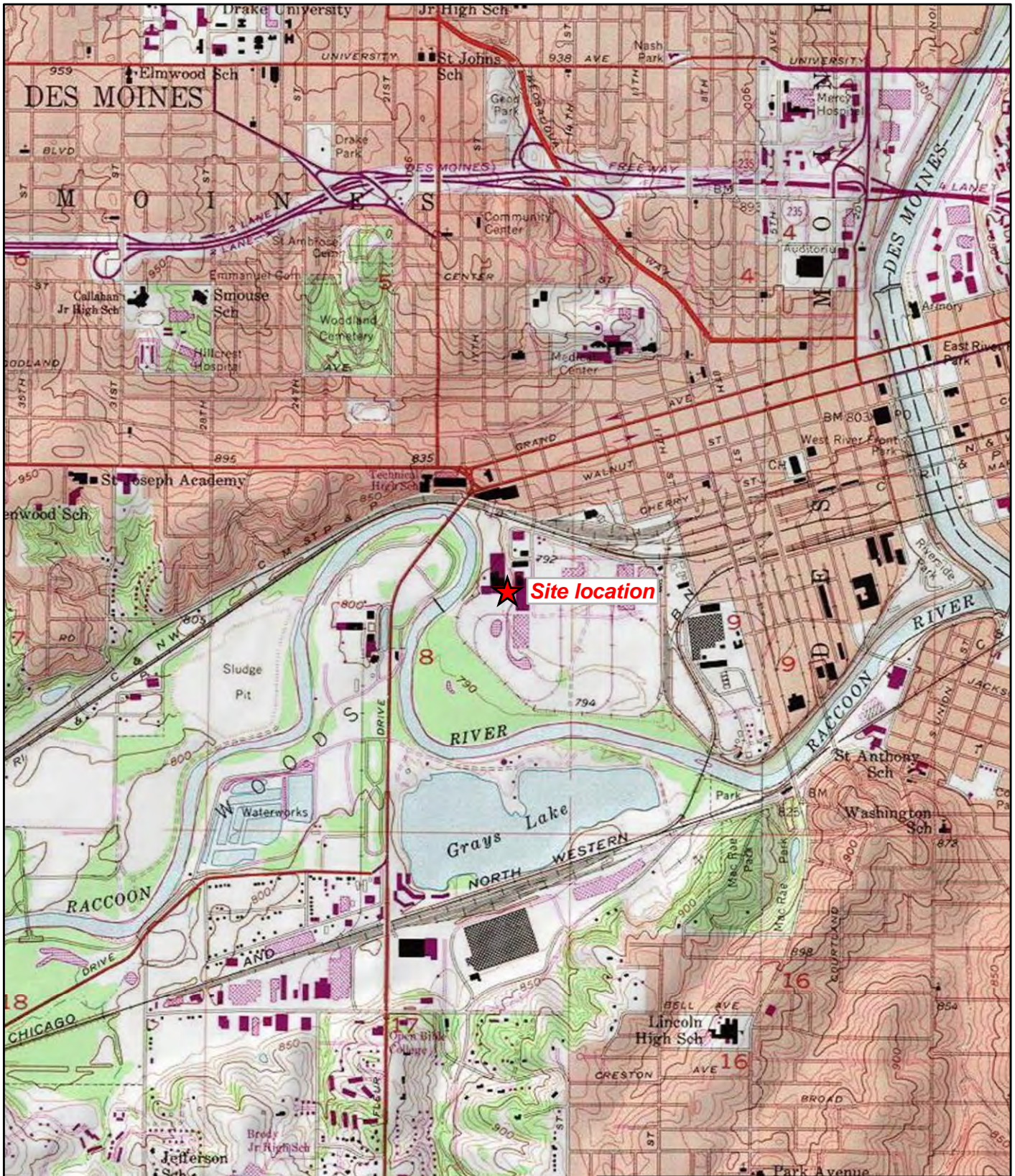
1. Remove and decommission the existing 30-foot air stripper tower.
2. Replace outdated controls and situate a low-profile air stripper tower and small building near the southwest side of the facility, which is out of the way of planned reuse.
3. Abandon or convert ERW-5 from an extraction well to a monitoring well. Remove aboveground piping and place a flush-mount well vault.
4. Remove aboveground piping, and add a pitless adapter and below-grade well-vault to ERW-6 and -7. Connect piping and controls to the new air stripper system. ERW-6 is to be a backup extraction well.
5. Locate one additional extraction well (ERW-10) east of ERW-7. Placement of ERW-10 will be near the former degreaser vat on the southwest side of the Production Building.
6. As appropriate, remove, abandon, and fix existing monitoring wells.

7.0 REFERENCES

- Des Moines Water Works. 2013. Standard Detail of 1" Copper Service Installation. April 29.
- Federal Emergency Management Agency (FEMA). 1987. Flood Insurance Rate Map, City of Des Moines, Iowa, Polk County, Panel 6 of 11), Community-Panel Number 190227 0006 D. September 18.
- Fehr Graham Engineering & Environmental. 2017. Performance Evaluation Report #31. Des Moines TCE Site (DICO). June 8.
- GHD. 2018. Preliminary Monitored Natural Attenuation Evaluation Report, Des Moines TCE Site, Des Moines, Iowa, EPA ID: IAD980687933. June 27.
- Layne Western Company, Inc. (Layne). 1987a. Well Information and Well Log for ERW-7, Dico Inc. June 16.
- Layne. 1987b. Well Information and Well Log for ERW-6, Dico Inc. June 24.
- Tetra Tech, Inc. (Tetra Tech). 2016. Quality Assurance Project Plan for Site Characterization Sampling Activities. Des Moines TCE Site, Des Moines, Iowa. May 23.
- U.S. Environmental Protection Agency (EPA). 2018a. Data Compilation Report for OU2 Soils, Revision 02. Des Moines TCE Site, Des Moines, Iowa. May 24.
- EPA. 2018b. Optimization Review Report Remedial Process Optimization Study. Des Moines TCE Superfund Site, OU1. Des Moines, Polk County, Iowa. EPA Region 7. October.
- EPA. 2018c. Des Moines TCE Site Redevelopment Assessment. June 2018.
- U.S. Fish and Wildlife Service (USFWS). 2016. National Wetlands Inventory Mapper. <https://www.fws.gov/wetlands/data/mapper.HTML>. Accessed October 28.

APPENDIX A

FIGURES



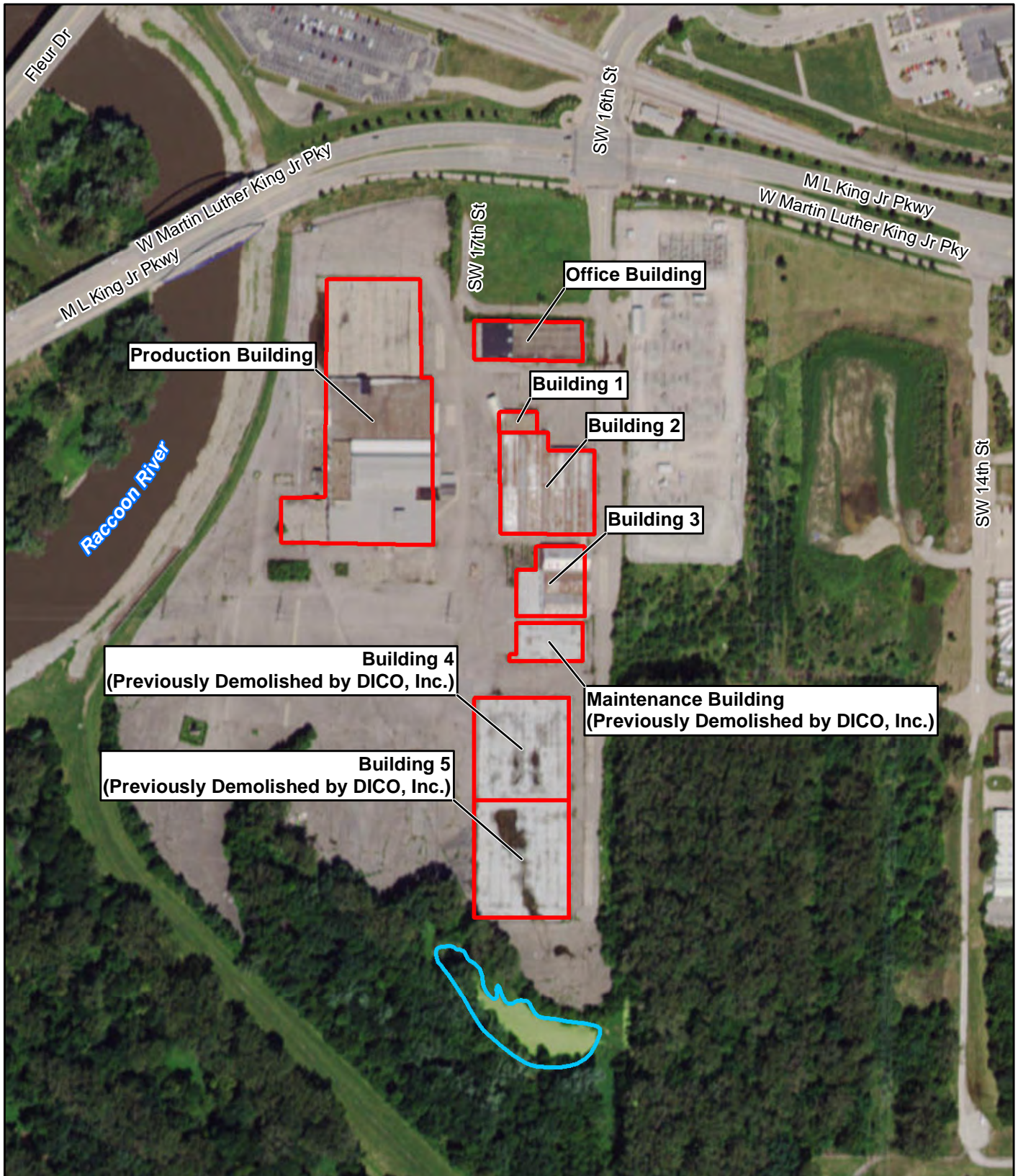
Des Moines TCE Site
Des Moines, Iowa

Figure 1
Site Location Map



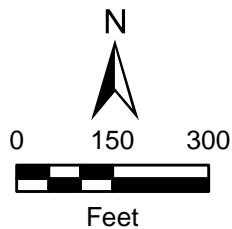
Source: USGS Des Moines SW, IA 7.5 Minute Topo Quad, 1976
USGS Des Moines SE, IA 7.5 Minute Topo Quad, 1976

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Legend

- Building location
- South pond area



Des Moines TCE Site
Des Moines, Iowa

Figure 2
Site Layout Map



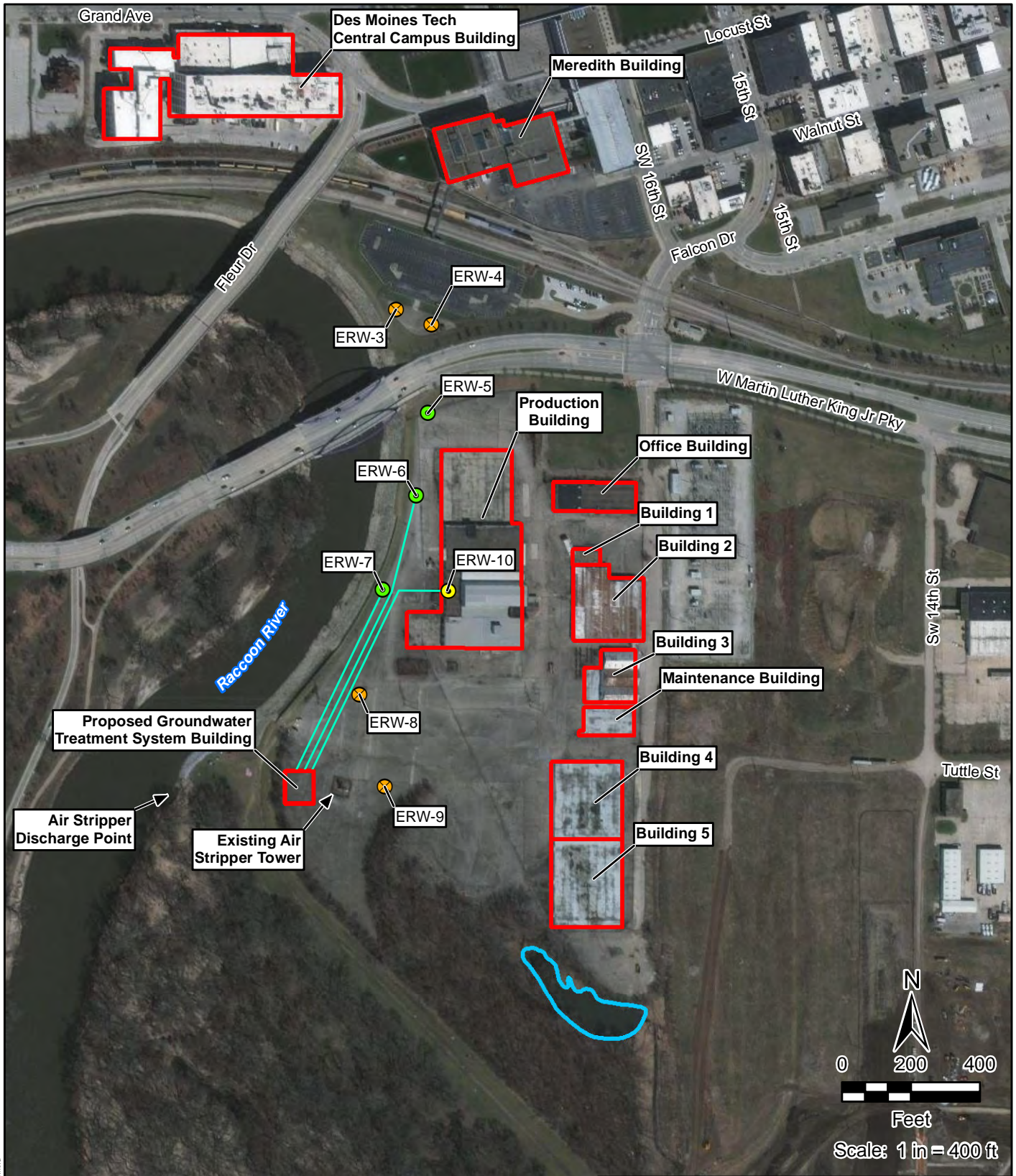
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Source: ESRI, ArcGIS Online Maps, World Imagery, 2014; HSIP Gold, 2007

Date: 10/5/2016

Drawn By: Nick Wiederholt

Project No: X903019F0074.000



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Legend	
	Abandoned recovery well
	Operating recovery well
	Proposed Recovery Well
	New proposed piping, electrical conduit and wire, and instrument cable
	Building location
	South pond area

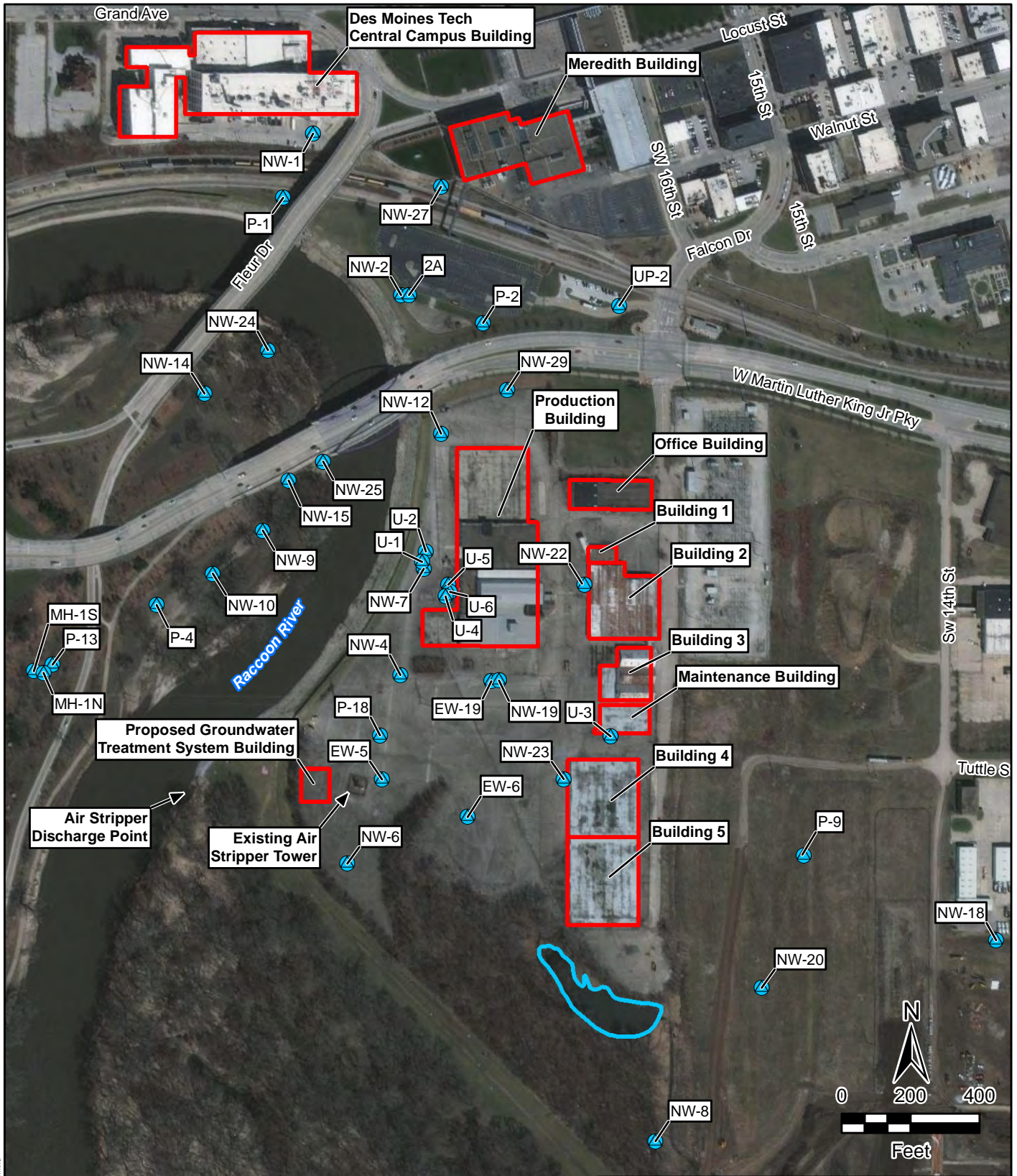
Source: ESRI, ArcGIS Online Maps, World Imagery, 2019; HSIP Gold, 2007; Fehr Graham Engineering & Environmental, Figure 1-Site Map, Des Moines TCE Site, 2016.

Des Moines TCE Site
Des Moines, Iowa

Figure 3
Groundwater Treatment System

TETRA TECH

Date: 5/12/2020 Drawn By: Nick Wiederholt Project No: X903019F0074.000



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Legend

- Monitoring well location
- Building location
- South pond area

Source: ESRI, ArcGIS Online Maps, World Imagery, 2019; HSIP Gold, 2007; Fehr Graham Engineering & Environmental, Figure 1-Site Map, Des Moines TCE Site, 2016; GHD, Figure 1.1-Monitoring Well Network, Des Moines TCE Site, 2018

Des Moines TCE Site
Des Moines, Iowa

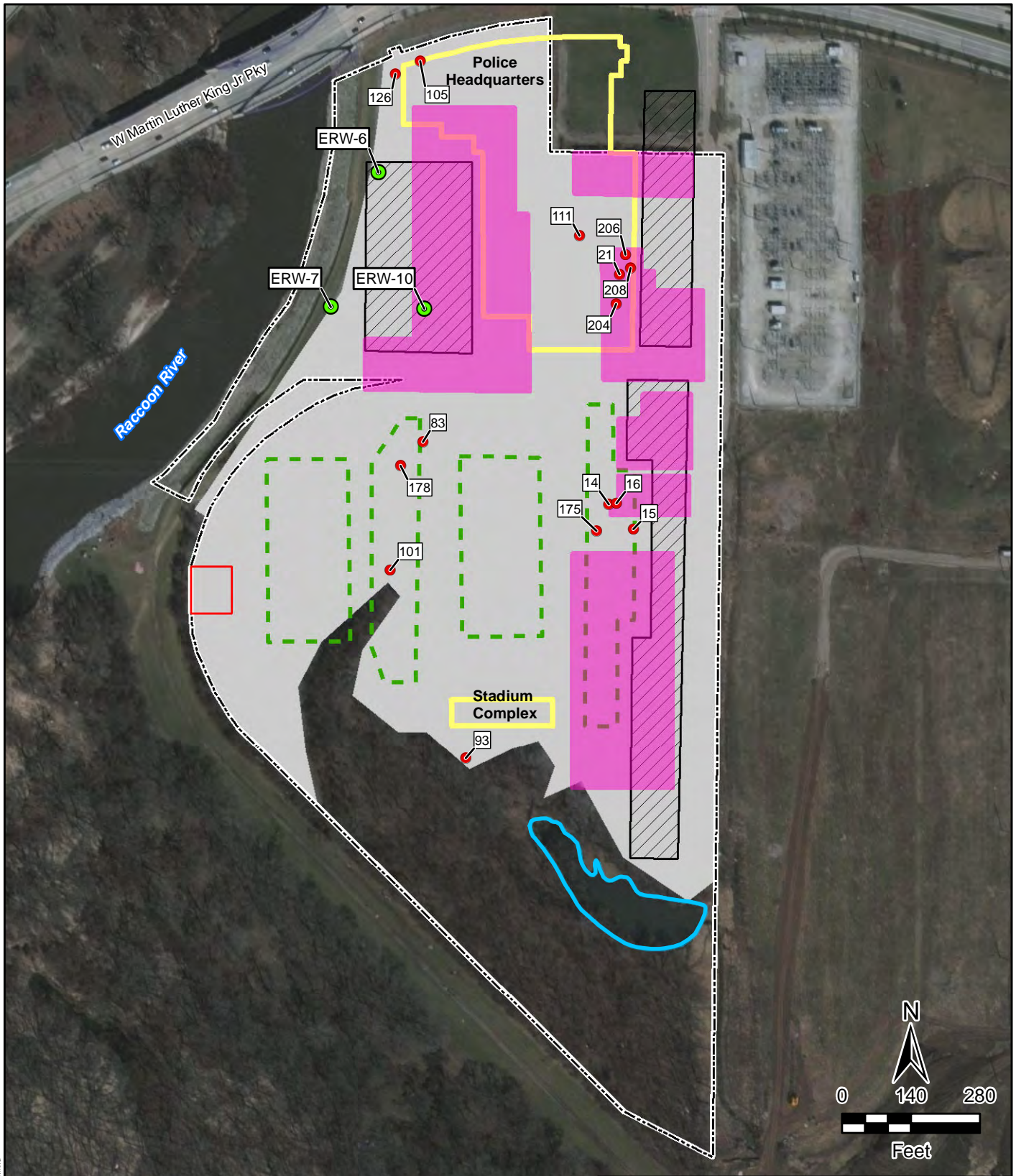
Figure 4
Existing Monitoring Well Network



Date: 5/12/2020

Drawn By: Nick Wiederholt

Project No: X903019F0074.000



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Legend		
● Potential hotspot	Parking (proposed)	Building location
Recovery well	Site boundary	South pond area
Asphalt cap	Sports complex feature (proposed)	Groundwater treatment system building (proposed)
Building footprint (proposed)		

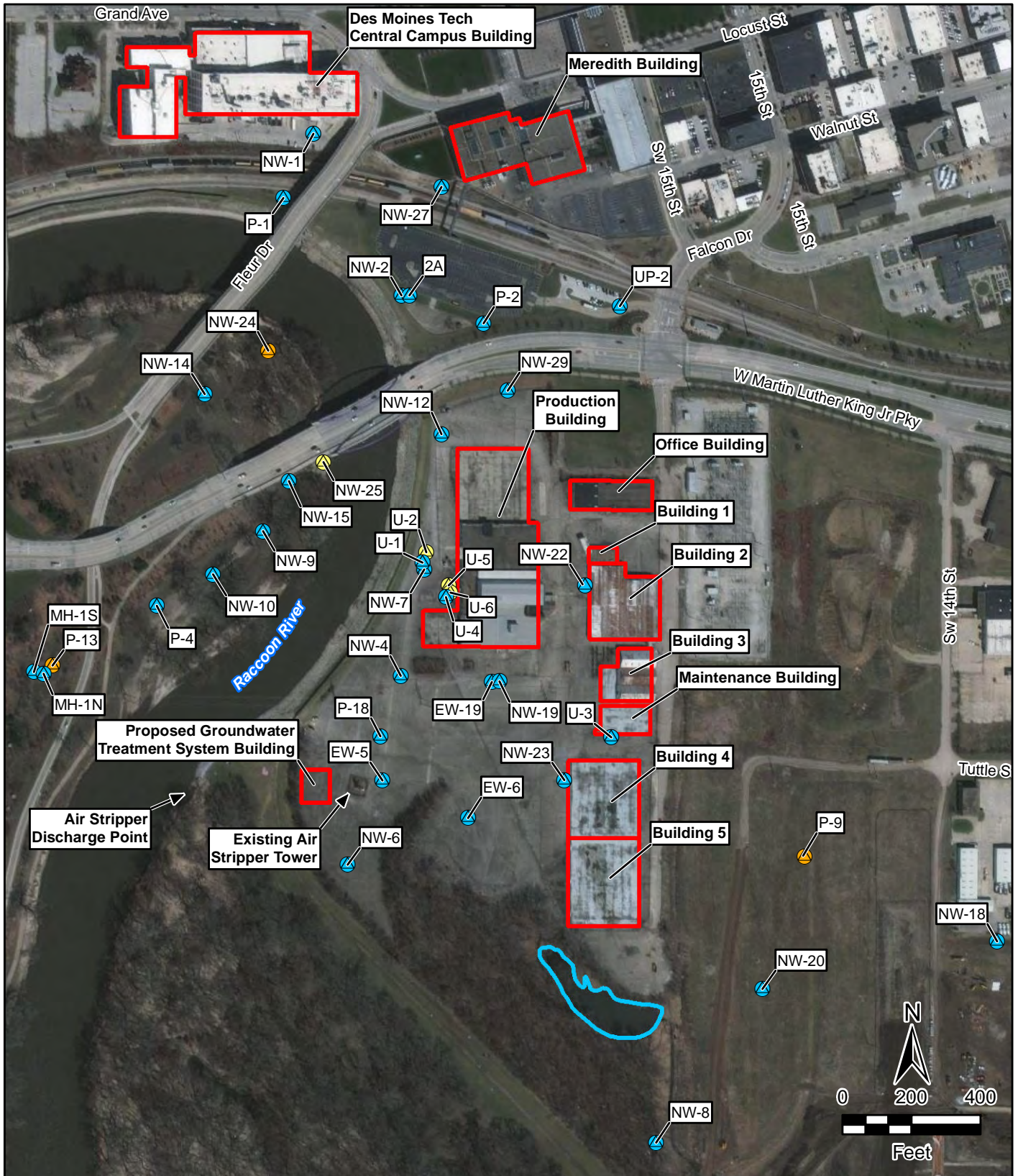
Source: ESRI, ArcGIS Online Maps, World Imagery, 2019; HSIP Gold, 2007; Skéo Solutions, Figure 1-Des Moines TCE Site Features and Potential Subsurface Soil Hotspots, 2018

Des Moines TCE Site
Des Moines, Iowa

Figure 5
Proposed Reuse Features
for the Former Dico Facility

TETRA TECH

Date: 5/8/2020
Drawn By: Nick Wiederholt
Project No: X903019F0074.000



Legend

- Monitoring well
- Monitoring well to be abandoned
- Monitoring well requiring repair
- Building location
- South pond area

Des Moines TCE Site
Des Moines, Iowa

Figure 6
Proposed Monitoring Well
Network Modifications



Source: ESRI, ArcGIS Online Maps, World Imagery, 2019; HSIP Gold, 2007; Fehr Graham Engineering & Environmental, Figure 1-Site Map, Des Moines TCE Site, 2016; GHD, Figure 1.1-Monitoring Well Network, Des Moines TCE Site, 2018

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APPENDIX B
REMEDIAL DESIGN ELEMENTS

Des Moines TCE Preliminary Extraction Well Conveyance Pipe and Pump Sizing Calculations

Desired Pumping elevation 760 (ft amsl)
 Top of air stripper piping elevation (ft amsl) 814 (ft amsl) ground elevation at air stripper is 802 ft, assume top of air stripper at 814 ft amsl
 Total Elevation Head 54 ft

Hazen Williams Formula $h_{100ft} = 0.43 \times 0.2083 \times (100 / c)^{1.852} \times q^{1.852} \times (1 / d_h^{4.8655})$

where:

h_{100ft} = headloss per 100 ft (psi)

c = Hazen Williams friction coefficient (dimensionless)

q = flow rate (gpm)

d_h = inside hydraulic diameter (inches)

ERW-6 (@83 gpm)				Hydraulic Diameter	Pressure Drop	Total Pressure Drop (psi)	Total Pressure Drop (ft H ₂ O)	Flow Velocity	Total Pump TDH (friction loss + elevation head; ft H ₂ O)
	unit	value	HDPE pipe	in	psi/100 ft pipe			ft/s	
l	length of pipe, horizontal	900	3" DR 11	2.83	1.09	11.15	25.73	4.24	79.73
l	Total equivalent length of pipe, including drop pipe (35') and 10 pct for fittings/valves, etc	1023	3" DR 17	3.06	0.75	7.63	17.59	3.62	71.59
c	Hazen-Williams roughness constant	140	4" DR 11	3.63	0.32	3.32	7.66	2.57	61.66
q	flow	83	4" DR 17	3.94	0.22	2.23	5.14	2.19	59.14

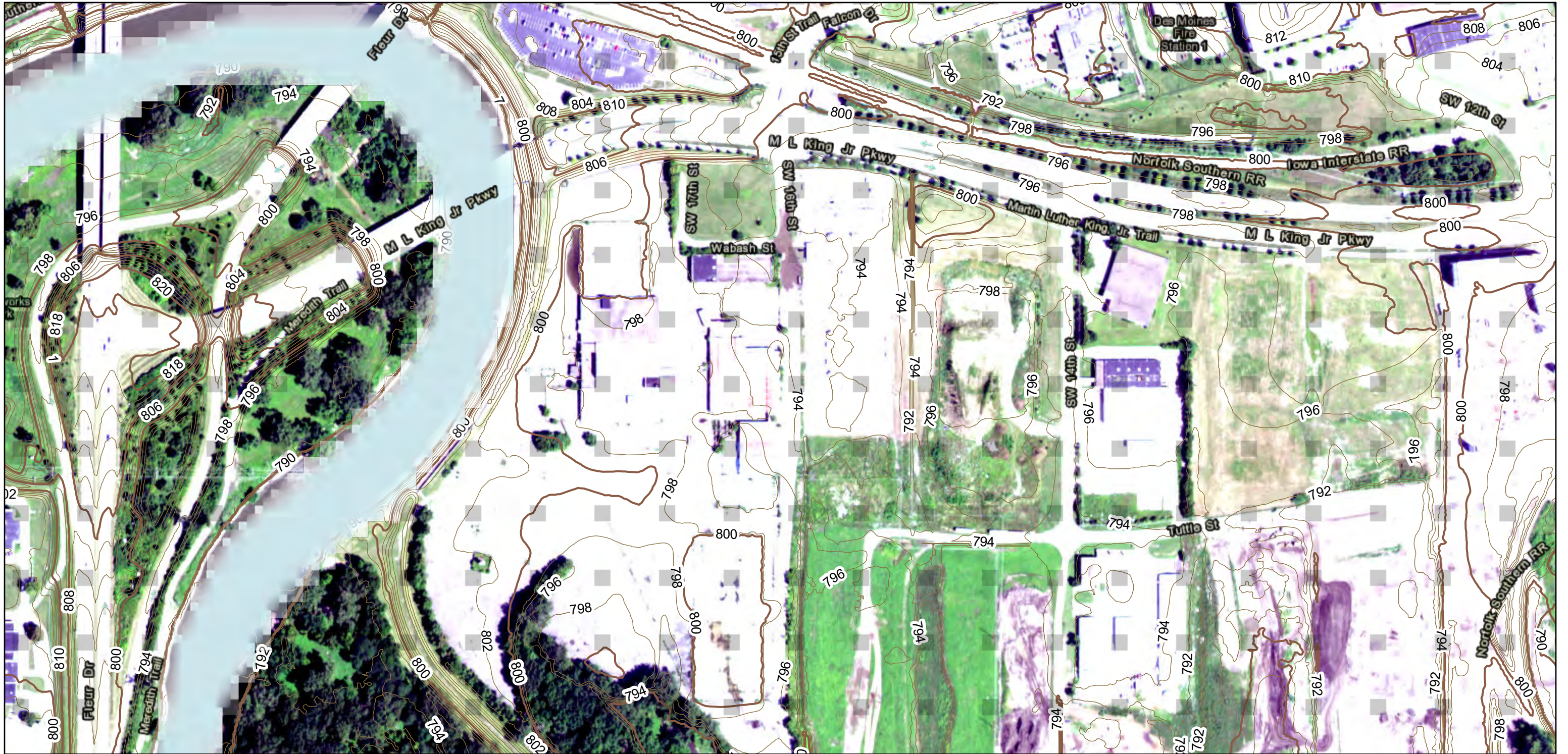
ERW-7 (@83 gpm)				Hydraulic Diameter	Pressure Drop	Total Pressure Drop (psi)	Total Pressure Drop (ft H ₂ O)	Flow Velocity	Total Pump TDH (friction loss + elevation head; ft H ₂ O)
	unit	value	HDPE pipe	in	psi/100 ft pipe			ft/s	
l	length of pipe, horizontal	600	3" DR 11	2.83	1.09	7.55	17.43	4.24	71.43
l	Total equivalent length of pipe, including drop pipe (35') and 10 pct for fittings/valves, etc	693	3" DR 17	3.06	0.75	5.17	11.92	3.62	65.92
c	Hazen-Williams roughness constant	140	4" DR 11	3.63	0.32	2.25	5.19	2.57	59.19
q	flow	83	4" DR 17	3.94	0.22	1.51	3.48	2.19	57.48

ERW-10 (@83 gpm)				Hydraulic Diameter	Pressure Drop	Total Pressure Drop (psi)	Total Pressure Drop (ft H ₂ O)	Flow Velocity	Total Pump TDH (friction loss + elevation head; ft H ₂ O)
	unit	value	HDPE pipe	in	psi/100 ft pipe			ft/s	
l	length of pipe, horizontal	775	3" DR 11	2.83	1.09	9.65	22.27	4.24	76.27
l	Total equivalent length of pipe, including drop pipe (35') and 10 pct for fittings/valves, etc	885.5	3" DR 17	3.06	0.75	6.60	15.23	3.62	69.23
c	Hazen-Williams roughness constant	140	4" DR 11	3.63	0.32	2.87	6.63	2.57	60.63
q	flow	83	4" DR 17	3.94	0.22	1.93	4.45	2.19	58.45

Notes

- text User input
- text Calculated output
- text Corresponding values within desired flow velocity range of 2 to 5 ft/s
- text Selected pipe

Iowa Geographic Map Server

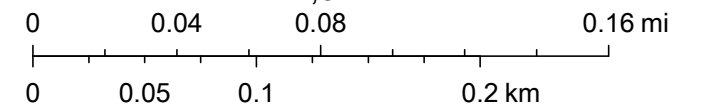


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Iowa - 2019 Orthophotos

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- Green: Band_2
- Blue: Band_3

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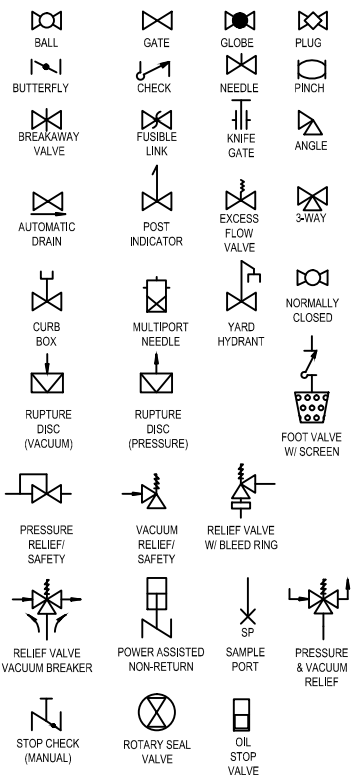
Esri, HERE, Garmin, (c) OpenStreetMap contributors, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, USDA NAIP, Iowa State University GIS Facility

INSTRUMENTATION IDENTIFICATION PREFIX																					
FIRST LETTERS	INITIATING OR MEASURED VARIABLE	CONTROLLERS				READOUT DEVICE			SWITCHES AND ALARM DEVICES*			TRANSMITTERS			SOLENOIDS, RELAYS, COMPUTING DEVICES	PRIMARY ELEMENT	TEST POINT	WELL OR PROBE	VIEWING DEVICE, GLASS	SAFETY DEVICE	FINAL ELEMENT
		RECORDING		INDICATING		RECORDING		INDICATING	HIGH	LOW	COMB.	RECORDING		INDICATING							
A	ANALYSIS	ARC	AIC	AC		AR	AI	ASH	ASL	ASHL	ART	AIT	AT	AY	AE	AP	AW	BG		AV	
B	BURNER/COMBUSTION	BRC	BIC	BC		BR	BI	BSH	BSL	BSHL	BRT	BIT	BT	BY	BE	BW			BZ		
C	USER'S CHOICE																				
D	USER'S CHOICE																				
E	VOLTAGE	ERC	EIC	EC		ER	EI	ESH	ESL	ESHL	ERT	EIT	ET	EY	EE	EW			EZ		
F	FLOW RATE	FRC	FIC	FC	FCV	FR	FI	FSH	FSL	FSHL	FRT	FIT	FT	FY	FE	FW	FG		FZ		
FQ	FLOW QUANTITY	FORC	FOIC	FOC		FOR	FOI	FOSH	FOSL	FOSHL	FQRT	FQIT	FQT	FQY	FQE	FQW			FQZ		
FF	FLOW RATIO	FFRC	FFIC	FFC		FFR	FFI	FFSH	FFSL	FFSHL									FFV		
H	USER'S CHOICE																				
I	HAND																				
J	CURRENT	IRC	IIC	IC		IR	II	ISH	ISL	ISHL	IRT	IIT	IT	IY	IE	IW			IZ		
JR	POWER	JRC	JIC	JC		JR	JI	JSH	JSL	JSHL	JRT	JIT	JT	JY	JE	JW			JV		
K	TIME	KRC	KIC	KC	KCV	KR	KI	KSH	KSL	KSHL	KRT	KIT	KT	KY	KE	KW			KV		
L	LEVEL	LRC	LIC	LC	LCV	LR	LI	LSH	LSL	LSHL	LRT	LIT	LT	LY	LE	LW	LG		LV		
M	USER'S CHOICE																				
N	USER'S CHOICE																				
O	USER'S CHOICE																				
P	PRESSURE/ VACUUM	PRC	PIC	PC	PCV	PR	PI	PSH	PSL	PSHL	PRT	PIT	PT	PY	PE	PW			PSV		
PD	PRESSURE, DIFFERENTIAL	PRDC	PRIC	PRC	PDCV	PRD	PROI	PRSH	PRSL	PRSHL	PRQRT	PROIT	PROT	PROY	PQE	PQW			PQZ		
OR	QUANTITY	ORC	ORIC	ORC		ORR	OI	ORSH	ORSL	ORSHL	ORRT	ORIT	ORT	ORY	ORE	ORW			ORZ		
S	RADIATION																				
T	SPEED/ FREQUENCY																				
TD	TEMPERATURE	TRC	TIC	TC	TCV	TR	TI	TSH	TSL	TSHL	TRT	TIT	TT	TY	TE	TW			TV		
TDI	TEMPERATURE, DIFFERENTIAL	TRDC	TDIC	TDI	TDIV	TDR	TDI	TDSH	TDSL	TDSHL	TDQRT	TDQIT	TDQT	TDY	TDQ	TDW			TDV		
U	MULTIVARIABLE																		UZ		
V	VIBRATION/ MACHINERY ANALYSIS																		VZ		
W	WEIGHT/ FORCE	WRC	WIC	WC	WCV	WR	WI	WSH	WSL	WSHL	WRT	WIT	WT	WY	WE	WW			WZ		
WD	WD WEIGHT/ FORCE, DIFFERENTIAL	WRDC	WDIC	WDC	WDCV	WRD	WDI	WDSH	WDSL	WDSHL	WRDRT	WRDIT	WRDWT	WRDY	WRE	WWW			WDZ		
X	UNCLASSIFIED																				
Y	EVENT/ STATE/ PRESENCE		YIC	YC		YR	YI	YSH	YSL	YSHL	YRT	YIT	YT	YY	YE	YW			YZ		
Z	POSITION/ DIMENSION	ZRC	ZIC	ZC	ZCV	ZR	ZI	ZSH	ZSL	ZSHL	ZRT	ZIT	ZT	ZY	ZE	ZW			ZV		
ZD	GALGING/ DEVIATION	ZDRC	ZDIC	ZDC	ZDCV	ZDR	ZDI	ZDSH	ZDSL	ZDSHL	ZDRT	ZDIT	ZDT	ZDY	ZDE	ZDW			ZDV		

NOTES: THIS TABLE IS NOT ALL-INCLUSIVE

ZSO (POSITION) SWITCH OPEN, ZSC (POSITION SWITCH CLOSED), FX (FLOW TEST POINT), QOI (INDICATION COUNTER), IL (PILOT LIGHT), PX (PRESSURE TEST POINT), SX (SAMPLE NOZZLE), TJR (SCANNING RECORDER), TX (TEMPERATURE TEST), XA (TROUBLE OR GENERAL ALARM), HR (HAND RESET), IUI (SERIAL DATA LINK), PFR (RATIO), PB (PUSHBUTTON), CY (COMMUNICATION MEDIA CONVERTER), HIS (HAND INDICATING SWITCH).

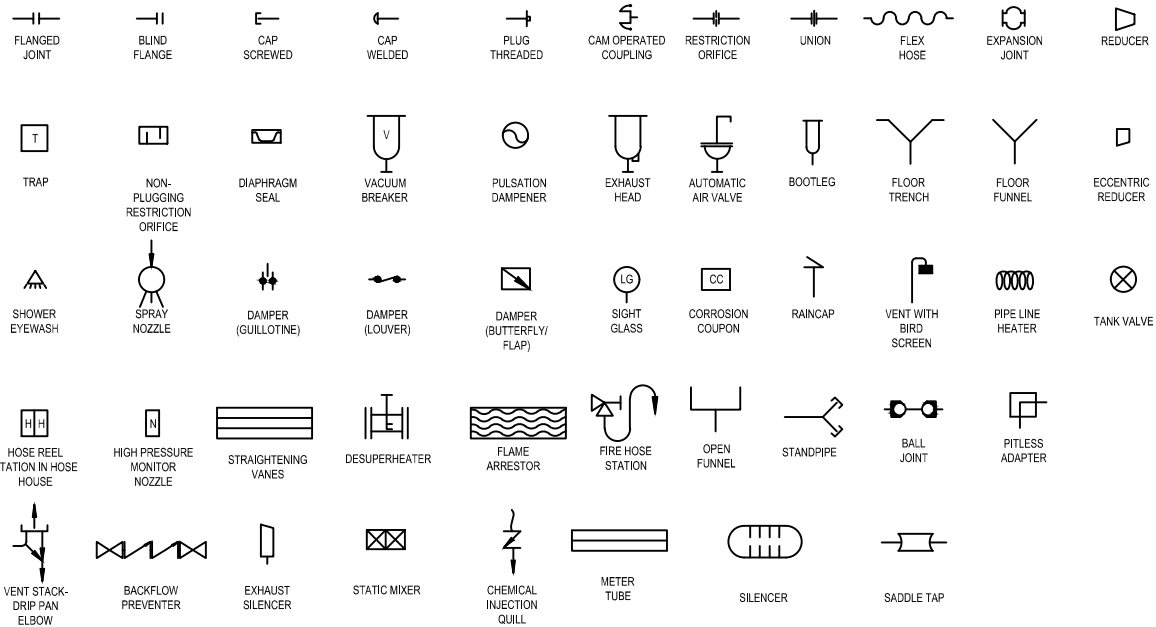
VALVE SYMBOLS



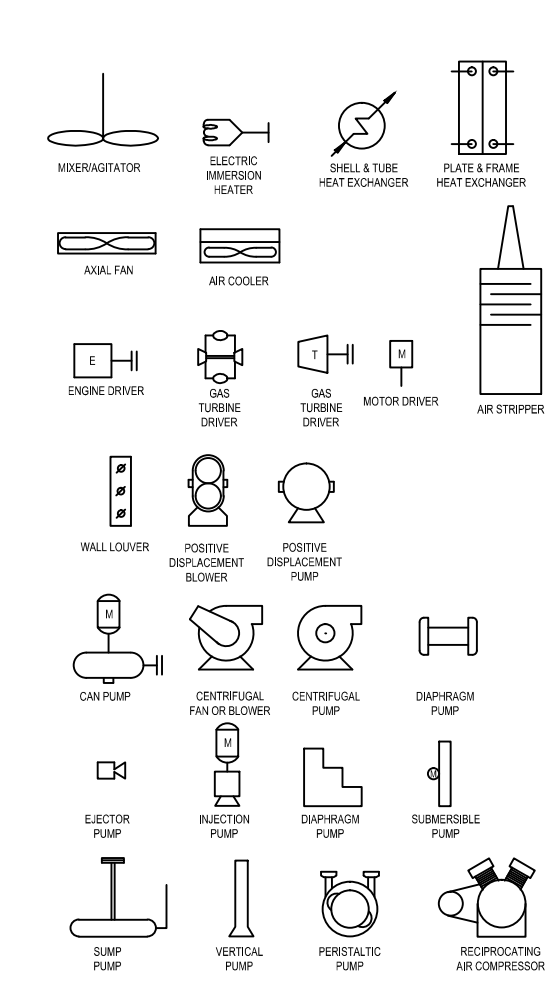
PIPING MATERIALS

- C900 = AWWA C900 PVC
- CPVC = CHLORINATED PVC, SCH. 80
- CS = CARBON STEEL
- FRP = FIBERGLASS REINFORCED PIPE
- HDPE = HIGH DENSITY POLYETHYLENE
- PE = POLYETHYLENE TUBING
- PVC = POLYVINYL CHLORIDE
- PVC FLEX = FLEXIBLE PVC HOSE
- RU = REINFORCED RUBBER HOSE
- SS = STAINLESS STEEL
- ST = CARBON STEEL, SCH. 40

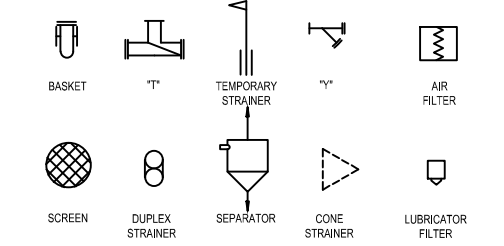
PIPING SYMBOLS



MECHANICAL EQUIPMENT



STRAINERS / FILTERS



NOTES:

FLUID SERVICE KEY

- AC - ACID
- AM - AMMONIA
- AS - AUXILIARY STREAM
- BD - BLOWDOWN
- CA - CAUSTIC
- CD - CARBON DIOXIDE
- CF - CONDENSATE CYCLE FLUSH
- CH - CHEMICAL
- CL - CHILLED WATER
- CO - CONDENSATE
- CR - COLD REHEAT
- CW - CIRCULATING WATER
- DR - DRAINS
- DW - DEMINERALIZED WATER
- ED - EQUIPMENT DRAIN
- EG - EXHAUST GAS
- EW - EQUIPMENT COOLING WATER
- EX - EXTRACTION STEAM
- FD - FLOOR DRAIN
- FF - FIRE PROTECTION FOAM
- FG - FUEL GAS
- FO - FUEL OIL
- FP - FIRE PROTECTION WATER
- FW - FEEDWATER
- GG - GLYCOL
- GL - GLYCOL LEAN
- GR - GLYCOL RICH
- GS - STARTING GAS
- HC - HEATING CONDENSATE
- HD - HEATER DRAINS
- HR - HOT REHEAT
- HW - HOT WATER
- IA - INSTRUMENT AIR
- IG - INSTRUMENT GAS
- JW - JACKET WATER
- LO - LUBE OIL
- MG - MAIN GAS
- MS - MAIN STEAM
- MW - MAKEUP WATER
- ND - DRAINS TO NEUTRALIZATION
- NG - NATURAL GAS
- NI - NITROGEN
- OD - ODORANT
- OW - OILY WASTE DRAINS
- PA - POWER AIR
- PG - POWER GAS
- PO - PRODUCED OIL
- PW - POTABLE/DOMESTIC WATER
- RD - ROOF DRAINS
- RW - RAW WATER
- SA - SERVICE AIR
- SS - SANITARY SEWER
- ST - STEAM (INCLUDING TRAPS)
- SW - SERVICE WATER
- TW - TREATED WATER
- UO - USED OIL
- VT - VENTS (INCL. RELIEF VALVE)
- WD - DRAINS TO WASTE DISPOSAL
- WL - WELL WATER
- WW - WASTE WATER

PIPING COMPONENTS KEY

- ADV - AUTOMATIC DRAIN VALVE
- AAV - AUTOMATIC AIR VALVE
- ARC - AUTOMATIC RECIRCULATION VALVE
- BJ - PIPING BALL (SWIVEL) JOINT
- BP - BACKFLOW PREVENTER
- BV - BREAKAWAY VALVE
- CC - CORROSION COUPON RACK
- DMP - DAMPER
- DH - DESUPERHEATER
- DPE - DRIP PAN ELBOW
- DRM - PORTABLE STORAGE DRUM
- DS - DUPLEX STRAINER
- EFV - EXCESS FLOW VALVE
- EH - EXHAUST HEAD
- EJ - EXPANSION JOINT
- ERV - ELECTROMAGNETIC RELIEF VALVE
- ES - EYEWASH/SHOWER
- FA - FLAME ARRESTOR
- FDC - FIRE DEPT. CONNECTION
- FH - FLEX HOSE
- FHY - FIRE HYDRANT
- FHZ - FIRE HOSE
- FL - FILTER
- FPV - FULL PORT VALVE
- IF - INSULATING FLANGES
- IQ - INSULATION QUILL
- IU - INSULATING UNION
- MH - MAN HOLE
- PC - PIG CLOSURE
- PD - PULSATION DAMPENER
- PG - PIG SIG
- PS - PERMANENT STRAINER
- QC - QUICK CONNECT
- RC - RAIN CAP
- RD - RUPTURE DISC
- RO - RESTRICTION ORIFICE
- SC - SAMPLE COOLER
- SCC - SPILL CONTROL CONTAINMENT
- SG - SIGHT GLASS
- SL - SILENCER
- SM - STATIC MIXER
- SN - SPRAY NOZZLE
- SP - SANDPIPE
- T - TRAP
- TS - TEMPORARY STRAINER
- US - UTILITY STATION
- VA - VALEVE (SECOND LETTER UNIQUE TO P&ID)
- VBK - VACUUM BREAKER
- YH - YARD HYDRANT

OTHER SYMBOLS

- V - BY VENDOR
- XXX - EQUIPMENT INTERFACE NUMBER
- TP # - TIE-POINT TAG

CONTRACT INTERFACE



STANDARD ABBREVIATIONS

- AG - ABOVE GROUND
- ANSI - DENOTES WORK UNDER ANSI CODE
- ASME - BOILER AND PRESSURE VESSEL CODE SECTION I
- ATM - VENTED TO SAFE LOCATION OUTSIDE
- BL - BATTERY LIMIT
- BWT - BACKWASH TANK
- CBO - CAR SEAL OPEN
- CSC - CAR SEAL CLOSED
- DIP - DUCTILE IRON PIPE
- EFF - EFFLUENT
- ESD - EMERGENCY SHUTDOWN
- EXIST - EXISTING
- EH - EXHAUST HEAD
- FC - FAIL CLOSED
- FL - FAIL LAST POSITION
- FO - FAIL OPEN
- HOA - HAND/OFF/AUTO
- HOR - HAND/OFF/ROTATE
- HPV - HIGH POINT VENT
- IAS - INSTRUMENT AIR SUPPLY
- INF - INFLUENT
- LC - LOCKED CLOSED
- LO - LOCKED OPEN
- LPD - LOW POINT DRAIN
- MMF - MULTI-MEDIA FILTER
- NC - NORMALLY CLOSED
- NO - NORMALLY OPEN
- ORP - OXYGEN REDUCING POTENTIAL
- RC - REVERSE OSMOSIS
- RU - REINFORCED RUBBER FLEXIBLE HOSE
- SC - SPEED CONTROL
- SD - SHUT DOWN
- RC - SAMPLE PORT
- S/S - START/STOP
- TDS - TOTAL DISSOLVED SOLIDS
- TP - SCOPE SPLIT TIE-POINT
- UG - UNDERGROUND
- VFD - VARIABLE FREQUENCY DRIVE

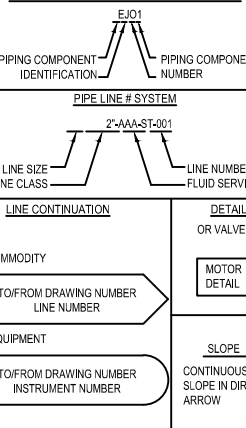
INSULATION & HEAT TRACE

- SEE LINE LIST OR INSULATION/ HEAT TRACE SPECIFICATIONS FOR ADDITIONAL DETAILS
- INSULATION OR HEAT TRACE
- FI ET
- INSULATION OR HEAT TRACE BOUNDARY
- ABBREVIATIONS:
- INSULATION
- TI - THERMAL INSULATION
- FI - FREEZE PROTECTION
- CI - COLD/ ANTI SWEAT
- PP - PERSONNEL PROTECTION
- HEAT TRACE
- ET - ELECTRIC TRACE
- MT - MEDIA TRACE
- ST - STEAM TRACE

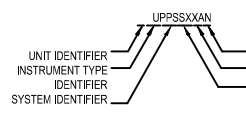
MATERIAL SPEC BREAK



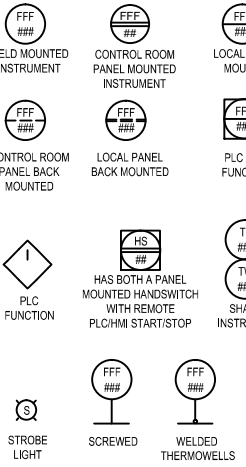
PIPING COMPONENT # SYSTEM



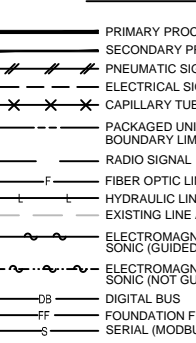
INSTRUMENT NUMBERING SYSTEM



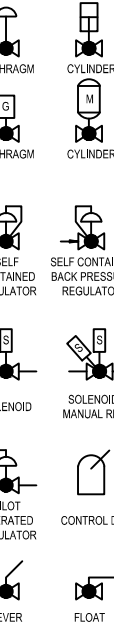
INSTRUMENTATION SYMBOLS



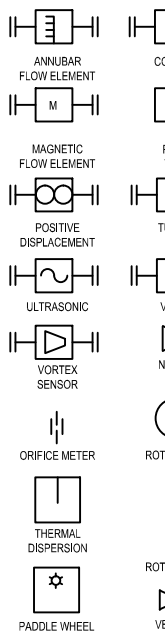
LINE SYMBOLS



VALVE OPERATORS



FLOW METERS



REVISIONS

NO.	DATE	DESCRIPTION
0	5/11/2020	PRELIMINARY DESIGN / TECHNICAL MEMO

DESIGNED

DJB
DRAWN: DWH
CHECKED: ---
DATE: 05/11/2020

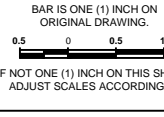
PREPARED BY:

TETRA TECH
415 OAK STREET
KANSAS CITY, MISSOURI 64106
816.412.1741



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7

VERIFY SCALE

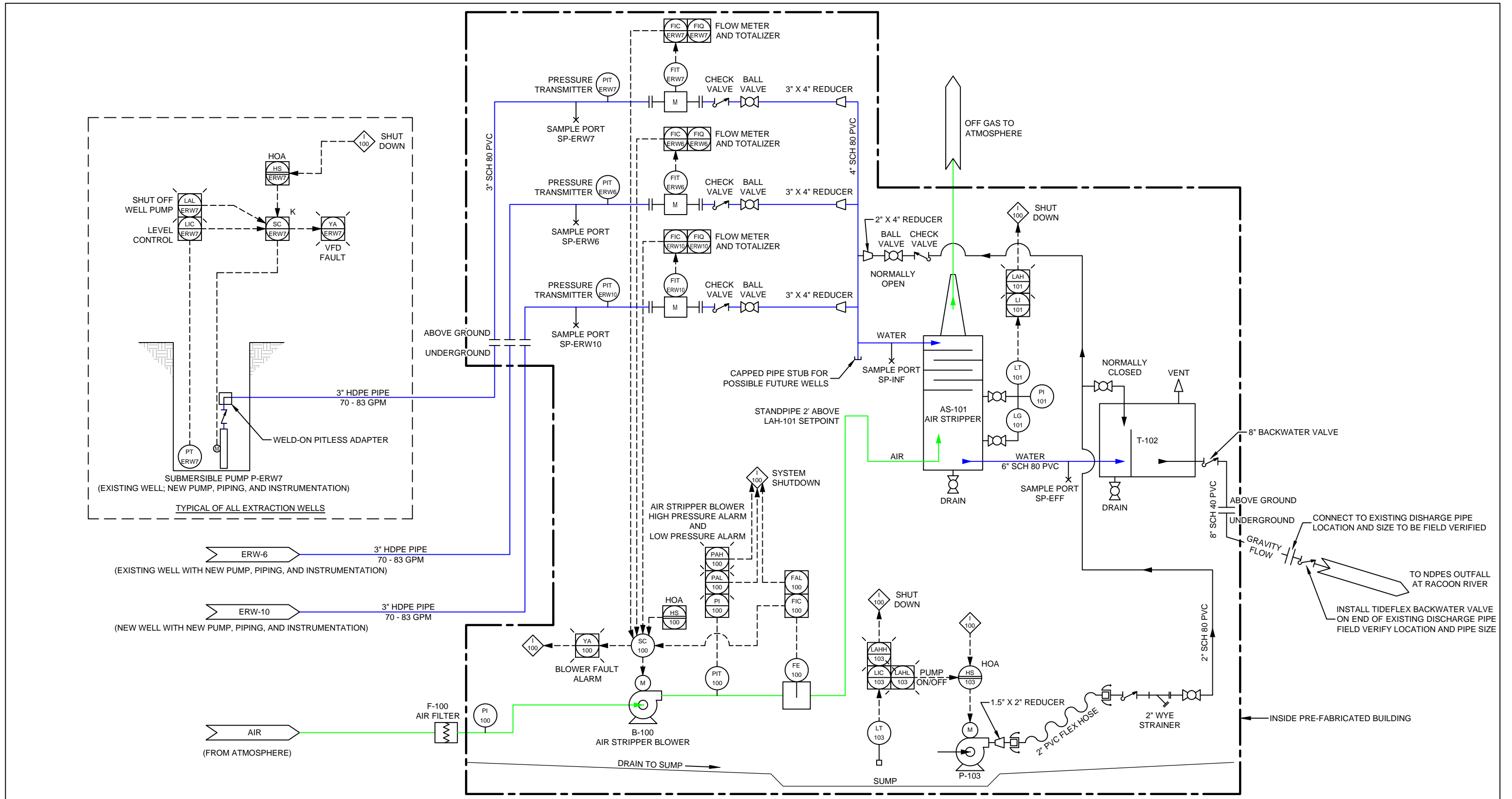


SCALES:

HORIZONTAL SCALE: NA
VERTICAL SCALE: NA

DES MOINES TCE SUPERFUND SITE
DES MOINES, IOWA
PIPING AND INSTRUMENTATION DIAGRAM
SYMBOLS AND ABBREVIATIONS

PROJECT NO. 1031903019F0074
DRAWING NO. G-2
SHEET NO. 1 OF 2



SUBMERSIBLE WELL PUMPS: P-ERW6, P-ERW7, P-ERW10:
 TYPE: SUBMERSIBLE CENTRIFUGAL
 CAPACITY: 85 GPM AT 78 FT HEAD
 MOTOR: 3-HP, 460-V, 3-PHASE MANUFACTURER: GRUNDFOS 85S30-2, OR APPROVED EQUAL

AIR STRIPPER BLOWER: B-100
 TYPE: CENTRIFUGAL WITH SILENCE
 CAPACITY: 1,300 CFM
 MOTOR: 15-HP, 460-V, 3-PHASE TEFC
 MANUFACTURER: NEW YORK BLOWER, OR APPROVED EQUAL

AIR STRIPPER: AS-101
 TYPE: 250-GPM, 4-TRAY STRIPPER
 304 STAINLESS STEEL TRAYS
 MANUFACTURER: QED EZ-24.6SS, OR APPROVED EQUAL

SUMP PUMP: P-103
 TYPE: SUBMERSIBLE CENTRIFUGAL
 CAPACITY: 33 GPM AT 15 FT HEAD
 MOTOR: 1/3-HP, 115-V, 1-PHASE TEFC
 304 STAINLESS STEEL
 MANUFACTURER: GRUNDFOS KP-250, OR APPROVED EQUAL

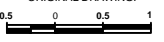
REVISIONS		
NO.	DATE	DESCRIPTION
0	5/11/2020	PRELIMINARY DESIGN / TECHNICAL MEMO

DESIGNED: DJB
 DRAWN: DWH
 CHECKED: ----
 DATE: 05/11/2020

PREPARED BY:
 **TETRA TECH**
 415 OAK STREET
 KANSAS CITY, MISSOURI 64106
 816.412.1741



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION 7

VERIFY SCALE
 BAR IS ONE (1) INCH ON ORIGINAL DRAWING.

 IF NOT ONE (1) INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

SCALES:
 HORIZONTAL SCALE: NA
 VERTICAL SCALE: NA

DES MOINES TCE SUPERFUND SITE
 DES MOINES, IOWA
 NEW AIR STRIPPER AND EXTRACTION WELL PUMP
 PIPING AND INSTRUMENTATION DIAGRAM

PROJECT NO. 1031903019F0074
 DRAWING NO. I-100
 SHEET NO. 2 OF 2

S:\CAD\Intercompany\Des Moines-TCE\I-100 Air Stripper-Extraction Well Pump.dwg