UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 7
901 N. 5th STREET, KANSAS CITY, KANSAS

IN THE MATTER OF:

OAK GROVE VILLAGE WELL SUPERFUND SITE, OPERABLE UNIT 2, CITY OF SULLIVAN LANDFILL RI/FS
Franklin County, Missouri

City of Sullivan, Missouri

Respondent

UNILATERAL ADMINISTRATIVE ORDER FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY

U.S. EPA REGION 7
Docket No. CERCLA-07-2009-0016

Proceeding Under Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §9606(a)

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I. INTRODUCTION AND JURISDICTION

1. This Unilateral Administrative Order for Remedial Investigation/Feasibility Study ("Order" or "City Order") is being issued by the U.S. Environmental Protection Agency to the city of Sullivan, Missouri ("Respondent" to this Order or "City"). This Order directs Respondent to perform a Remedial Investigation/ Feasibility Study ("RI/FS") as described herein and in the attached Statement of Work ("SOW") (Attachment 1) at the Oak Grove Village Well Superfund Site, Operable Unit 2, specifically, the old city of Sullivan landfill (the "Site"). The EPA has entered into a Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study, Region 7, Docket No. CERCLA-07-2009-0014 ("AOC") for the Site with TRW Automotive U.S., LLC. ("TRW"). As described in Section IX of this City Order, the Work under this City Order shall be performed in coordination with Work performed under the AOC. A parallel unilateral order ("Meramec Order") to this Order is being contemporaneously issued to Meramec Group, Inc.

2. This Order is issued pursuant to the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. § 9606(a) as amended ("CERCLA"), and delegated to the Administrator of the United States Environmental Protection Agency ("EPA") by Executive Order No. 12580, January 23, 1987, 52 Fed. Reg. 2923, as amended by Executive Order No. 13016, August 30, 1996, 61 Fed. Reg. 45871, further delegated to the Regional Administrators by EPA Delegation Nos. 14-14-A and 14-14-B and further redelegated to the Director, Superfund Division, by Regional Delegation R7-14-014-B, April 19, 1999.

3. In issuing this Order, the objectives of EPA are: (a) to determine the nature and extent of contamination and any threat to the public health, welfare, or the environment caused by the release or threatened release of hazardous substances, pollutants, or contaminants at or from the Landfill, by conducting a Remedial Investigation as more specifically set forth in the Statement of Work ("SOW") attached as Appendix A to this Order; (b) to identify and evaluate

remedial alternatives to prevent, mitigate or otherwise respond to or remedy any release or threatened release of hazardous substances, pollutants, or contaminants into groundwater at or from the Landfill, by conducting a Feasibility Study as more specifically set forth in the SOW in Appendix A to this Order; and (c) to recover response and oversight costs incurred by EPA with respect to the Work.

4. The activities conducted under this Order are subject to approval by EPA. The activities under this Order shall be conducted in accordance with the SOW and all applicable EPA guidances, policies, and procedures.

II. DEFINITIONS

Unless otherwise expressly provided herein, terms used in this Order which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in the statute or its implementing regulations. Whenever terms listed below are used in this Order or in the documents attached to this Order or incorporated by reference into this Order, the following definitions shall apply:

a. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601, *et seq.*

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

c. "Effective Date" shall be, except as otherwise provided, the effective date of this Order as provided in Section XXVIII (Effective Date and Computation of Time).

d. "Engineering Controls" shall mean constructed containment barriers or systems that

control one or more of the following: downward migration, infiltration or seepage of surface runoff or rain; or natural leaching migration of contaminants through the subsurface over time. Examples include caps, engineered bottom barriers, immobilization processes, and vertical barriers.

e. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

f. "Institutional controls" shall mean non-engineered instruments, such as administrative and/or legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of a remedy by limiting land and/or resource use. Examples of institutional controls include easements and covenants, zoning restrictions, special building permit requirements, and well drilling prohibitions.

g. "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, 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.

h. "MDNR" shall mean the Missouri Department of Natural Resources and any successor departments or agencies of the State.

i. "Meramec" shall mean Meramec Group, Inc., a Missouri Corporaton.

j. "Meramec Order" shall mean the parallel Unilateral Order for Remedial Investigation/Feasibility Study, Region 7 Docket No. CERCLA-07-2009-0017 issued to Meramec Group, Inc.

k. "Municipal solid waste" shall mean waste material: (i) generated by a household (including a single or multifamily residence); or (ii) generated by a commercial, industrial or

institutional entity, to the extent that the waste material – (a) is essentially the same as waste normally generated by a household; (b) is collected and disposed of with other municipal solid waste as part of normal municipal solid waste collection services; and (c) contains a relative quantity of hazardous substances no greater than the relative quantity of hazardous substances contained in waste material generated by a typical single-family household.

l. "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.

m. "Operable Unit 2"or "OU2" shall mean the area within the Oak Grove Village Well Superfund Site as generally depicted in Appendix B map.

n. "Order" or "City Order"shall mean this Unilateral Order for Remedial Investigation/Feasibiliity Study issued to the city of Sullivan, Missouri for the Sullivan Landfill RI/FS.

o. "Paragraph" shall mean a portion of this Order identified by an Arabic numeral.

p. "Performing Party(ies) shall mean TRW and persons performing or paying for Work required by this Order.

q. "RCRA" shall mean the Resource Conservation and Recovery Act, also known as the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901, *et seq.*

r. "Respondent" to this Order shall mean the city of Sullivan, Missouri ("City").

s. "Section" shall mean a portion of this Order identified by a Roman numeral.

t. "Settlement Agreement" shall mean the Administrative Settlement Agreement and Order

Consent for Remedial Investigaiton/Feasibility Study (Docket No.CERCLA-07-2009-0014) , the SOW, all appendices attached thereto, and all documents incorporated by reference into the Settlement Agreement.

u. "Site" for purposes of the Work under this Order shall mean the city of Sullivan landfill and areas where contamination from the landfill has come to be located. The Landfill is located in Franklin County, Missouri and depicted generally on the map attached as Appendix B. The Landfill is legally described as Part of Lot 2, SW 1/4 of the NE 1/4 of Section 3, Township 40 North, Range 3 West P.M.

v. "State" shall mean the state of Missouri.

w. "Statement of Work" or "SOW" shall mean the Statement of Work for development of a RI/FS, as set forth in Appendix A to this Order. The SOW is incorporated into this Order and is an enforceable part of this Order as are any modifications made thereto in accordance with this Order. The SOW is the same one attached to the Settlement Agreement and City is deemed the Respondent to the SOW as incorporated into this Order.

x. "TRW" shall mean TRW Automotive U.S., LLC.

y. "Waste Material" 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); and (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27).

z. "Work" shall mean all activities Respondent is required to perform under this Order.

III. FINDINGS OF FACT

Introduction

1. The Oak Grove Village Well Superfund Site ("OGVW Site") is located in Franklin County, Missouri. The OGVW Site was proposed for the National Priorities List ("NPL") on September 13, 2001, and the listing became final pursuant to CERCLA Section 105, 42 U.S.C. § 9605, on September 2, 2002:

a. The OGVW Site has been subdivided into two Operable Units. Operable Unit 1 ("OU1") includes the contamination in the area of the Oak Grove Village Well. Operable Unit 2 ("OU2") includes the Landfill and La Jolla Spring, as well as nearby wells and springs. Investigations conducted over the past ten years have identified groundwater contamination over a wide area at the Site.

b. The closed 28-acre Landfill is owned by the city of Sullivan and is located east of Highway 185 and directly south of Emma Lane in a residential area. Adjacent to the Landfill on the east is the Voss Meat Packing Plant. The Landfill is approximately three miles north of downtown Sullivan and approximately 4,900 feet northeast of the Oak Grove Village ("OGV") municipal wells. Other nearby wells include city of Sullivan Wells #9 and #10. Appendix B depicts the OGVW Site, including the areas covered by OUs 1 and 2.

c. The La Jolla Spring is a cave complex located approximately two miles east of the Landfill. Winsel Creek flows through the area designated as OU2 into the Bourbese River. The Bourbese River is a tributary of the Meramec River, which is located east of the Landfill.

d. TRW Automotive U.S., LLC is a corporate successor in interest to TRW, Inc. and Meramec Group, Inc. is a corporate successor to Meramec Industries, Inc.

Landfill Operations

e. In 1970, the city of Sullivan began Landfill operations with the disposal of municipal and industrial wastes in an old ravine fill area. From 1970 to 1975, both industrial and municipal wastes were deposited in the ravine. The Landfill was first permitted by MDNR in 1974.

f. Standard operations at the Landfill ravine included crushing drums intact and/or pouring the contents of the drums into the ravine before crushing them.

g. In 1975, the City submitted a plan to MDNR to phase out the ravine operation and develop trench cells in the northern portion of the Landfill. The ravine and trench fill areas were separated by an east-west ridge.

h. In 1978, MDNR issued a landfill permit for trench-type disposal for an 8.5-acre area at the Landfill. In 1982, an additional 0.5-acre trench area was permitted by MDNR.

i. The trench fill area included the development of a series of shallow trenches approximately 25 feet wide and 200 feet long. During trench construction, the City included an industrial waste cell to store approximately 200 drums. Landfill records indicate that drums of barium chromate and TCE/oil and grease mixtures were deposited in the industrial waste cell.

j. The City ceased accepting wastes for landfilling at the Landfill in 1983.

k. TRW, Meramec Industries, Inc. and the City began construction of a landfill cap and associated leachate collection system in 1994. The construction was completed in 1995, and MDNR approved landfill closure in 1996.

Environmental Investigations

l. In August 1990, the City entered into a Hydrochemical Investigation with the United

States Geological Survey ("USGS") as a result of samples taken from the leachate collected at the Sullivan Landfill, as well as groundwater samples from several area wells, including the OGV municipal #1 well ("OGV01"), a former Sullivan municipal well, and the Landfill monitoring wells.

m. During the Hydrochemical Investigation, USGS sampled three of the largest seeps from the Sullivan Landfill for volatile organic compounds ("VOCs") and metals. Results indicated the presence of tetrachloroethylene ("PCE") from 8 to 19 micograms per liter (ug/l) and trichloroethylene ("TCE") from 150 to 370 ug/l. TCE degradation products, Freons, and other ccontaminants were also detected.

n. In September 1990, MDNR issued the City a citation based upon available sampling results and the annual solid waste disposal facility inspections. In response to the MDNR citation, the City constructed berms around the seeps to help prevent off-site migration of leachate.

o. In October 1990, Sullivan issued a Notice of Liability letter to the Ramsey Corporation (owned by TRW, Inc.) and Meramec Industries as primary contributors of hazardous waste in the Landfill. The City estimated that TRW, Inc., deposited 7,500 barrels of hazardous waste in the Landfill and Meramec Industries deposited 356 barrels of hazardous waste.

p. After the City's Notice of Liability letters were mailed out, a potentially responsible party ("PRP") group was formed to address contamination from the Sullivan Landfill. This group was comprised of TRW, Inc.,the City and Meramec Industries, Inc.

q. In 1991, MDNR's Division of Geology and Land Survey performed five dye tracer tests in the Sullivan area. One of these tracers was injected into a sinkhole at the Landfill. The tracer was identified in La Jolla Spring 179 days after the tracer was released into the sinkhole.

r. In May 1992, prior to closure of the Landfill, approximately 149 55-gallon drums and 32 5-gallon buckets that had been deposited in the industrial waste cell were removed by the PRP Group.

s. The PRP Group installed six monitoring wells at the Landfill to determine if contaminants were migrating from the site. The shallowest monitoring well (MW-105) was drilled to 177 feet bgs; the deepest monitoring well (MW-102A) was drilled to an approximate depth of 275 feet.

t. Several contaminants, including TCE and Freon 11, have been detected in all six of the Landfill monitoring wells (MW101, MW102A, MW102B, MW103, MW104, MW105) since their installation in 1992. TCE concentrations have been consistently detected from 0.5 ug/l to 6.6 ug/l, and Freon 11 has been detected from 1.4 ug/l to 197 ug/l.

u. The Voss well (354 feet deep), a private well located adjacent to the Landfill, has had TCE detections during sampling events since 2000 at levels ranging from 1.6 to 5.4 ug/l, and Freon 11 at levels from 15 ug/l to 120 ug/l.

v. Contaminants, including TCE, have been detected in the deepest Landfill monitoring well, indicating contamination underneath the Landfill has migrated to depths greater than 275 feet and is impacting the area groundwater at depths greater than 275 feet.

w. In 2005, during the Phase II Remedial Investigation ("RI") for the Oak Grove Village Well Superfund Site, MDNR drilled three deep monitoring wells. One of these wells was located 250 feet south of the Sullivan Landfill. The well was drilled 501 feet bgs, for a total depth of 505 feet. The open annulus of the well is referred to as MW-1A and the deeper open-hole section below the riser from 349 to 505 feet bgs is referred to as MW-1.

x. In April 2006, MDNR took samples from MW-1A and MW-1. Both field analysis and laboratory results showed small concentrations of TCE and other contaminants in MW-1A. No concentrations were detected in MW-1.

y. During Phase I and Phase II of the RI, MDNR conducted periodic sampling of private wells near the Landfill. Several contaminants, including TCE and Freon 11, were routinely detected in private wells located west of the Landfill. Two of these private wells had TCE detections above the maximum contaminant level ("MCL") of 5 ug/l and were provided whole-house filtration systems by EPA in 2003.

z. The detection of contaminants in MW-1A, the Landfill monitoring wells, and nearby private wells indicates that releases at the Landfill are impacting shallow groundwater in the upper aquifer. These contaminant releases have been detected in off-site wells, both west and south of the Landfill.

aa. From October 2002 to January 2005, EPA and MDNR conducted six sampling events (air and water) in the La Jolla Spring Cave Complex. Sample results detected the presence of Freon 12; Freon 11; 1,1-Dichloroethene; Methylene Chloride; cis-1,2-Dichloroethene; Trichloroethene; Toluene; m,p-Xylene; 1,4-Dichlorobenzene; PCE; ethanol; 2-propanol; and acetone. In the cave air, Freon 11 was detected as high as 270 uG/m3 and TCE was detected at levels up to 1700 uG/m3. Water samples within the La Jolla Spring Cave Complex detected Freon 11 at levels up to 2.13 ug/l and TCE at levels up to 12.6 ug/l.

bb. The dye trace results, as well as the suite of contaminants found in the cave air and the cave water that are consistent with contaminants found in Landfill wells, support the conclusion that a groundwater pathway may exist from the Sullivan Landfill to the La Jolla Spring Cave Complex.

cc. After Phase II of the RI was complete, the OGVW Site was divided into two operable units to complete additional site work. An Interim ROD has been completed for OU1. The

selected remedy is being implemented by the EPA. The major components of the selected remedy for OU1 include: (1) sampling residential and commercial/industrial wells for TCE contamination and providing an alternate water supply to replace wells above established risk levels; (2) monitoring Oak Grove Village municipal well number 2 to ensure the air stripper continues to provide a clean water supply and evaluate the air stripper's impact on TCE groundwater concentrations; (3) properly plugging and abandoning Oak Grove Village municipal well number 1 and a nearby monitoring well; and (4) implementing informational institutional controls to raise awareness of the contamination in OU1.

Site Geology

dd. The geology in the area underneath the Landfill consists of overburden soils and carbonate rock, with some residual sandstone. Karst features are also present around the Landfill and include numerous sinkholes, losing streams, caves, and springs, due to subsurface weathering of the carbonate rock. The Site is located in the Ozark Plateaus aquifer system, which extends over most of southern Missouri. The Ozark Plateaus system consists of three aquifers that are separated by two confining units. Out of the three aquifers in the Ozark Plateaus aquifer system, the two uppermost aquifers -- the Springfield aquifer and the Ozark aquifer -- are the only ones utilized for public and domestic wells, and will, therefore, be the focus of this investigation.

Site Risks

ee. In June 2005, the Missouri Department of Health and Senior Services performed a Baseline Human Health Risk Assessment for the OGVW Site. This Risk Assessment specifically looked at the groundwater plume from the Landfill. For both the future residential and future industrial/commercial scenarios, the HHRA found that the potential existed for unacceptable carcinogenic risk using groundwater affected by the Landfill. Also, for both scenarios, unacceptable non-carcinogenic risks were potentially present.

ff. La Jolla Spring and its associated cave complex were found to be contaminated with VOCs. The cave complex is a tourist attraction. Complete exposure pathways included inhalation of contaminated air inside the cave. The Risk Assessment concluded that visitor exposure to the contaminated air in the complex was not expected to pose any adverse health effects. For workers in the cave complex, the Risk Assessment concluded that unacceptable carcinogenic and non-carcinogenic risks were present.

gg. The Potential Chemicals of Concern ("PCOC") at the Site include TCE; PCE; associated breakdown products of TCE and PCE; and Freon Compounds. TCE is the principal PCOC in the groundwater at OU2 and in air if it volatizes out of groundwater. TCE, a halogenated organic compound, is a colorless liquid with a chloroform-like odor. TCE was historically used as a solvent and degreaser in many industries. Exposure to this compound has been associated with injurious health effects in humans, including neurotoxicity, immunotoxicity, developmental toxicity, liver toxicity, kidney toxicity, endocrine effects, and several forms of cancer. Based on EPA's current cancer guidelines, TCE is considered a probable human carcinogen.

hh. On January 20, 2005, the EPA issued a final document entitled Screening Level Ecological Risk Assessment, Oak Grove Village Well Site, and La Jolla Spring Cave Complex. Results of the risk assessment indicate that the levels of TCE in the air are a potential concern for bats that may be living inside the cave under normal metabolic conditions. Two endangered bat species, the Gray Bat and the Indiana Bat, have been located in the counties were the cavern is located.

IV. CONCLUSIONS OF LAW AND DETERMINATIONS

1. The city of Sullivan Landfill is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

2. The contamination found at the Site, which includes TCE and PCE as identified in the Findings of Fact above, includes "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

3. The presence of hazardous substances at the Site or the past, present, or potential migration of hazardous substances currently located at or emanating from the Site, constitute actual and/or threatened "releases" as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

4. The actual or threatened release of one or more hazardous substances from the Site may present an imminent and substantial endangerment to the public health or welfare or the environment.

5. Respondent is a "person" as defined in Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

6. Respondent is a responsible party under Sections 104, 107, and 122 of CERCLA, 42 U.S.C. §§ 9604, 9607, and 9622. Respondent is the owner/operator of the Landfill facility and/or was the owner/operator at the time of disposal of the hazardous substances within the meaning of 107(a)(1) and (2) of CERCLA, 42 U.S.C. § 9607(a)(1) and (2).

7. The RI/FS required by this Order is necessary to abate an imminent and substantial endangerment because of an actual or threatened release of hazardous substances from the Site and protect the public health or welfare or the environment, is in the public interest, not inconsistent with CERCLA and the NCP, and will expedite effective remedial action.

V. NOTICE TO THE STATE OF MISSOURI

On September 30, 2009, EPA notified the State of Missouri, that EPA would be issuing this Order.

VI. ORDER

Based on the foregoing, Respondent is hereby ordered to comply with the following provisions, including, but not limited to all attachments to this Order, all documents incorporated by reference into this Order, and all schedules and deadlines in this Order, attached to this Order, or incorporated by reference into this Order.

VII. NOTICE OF INTENT TO COMPLY

Respondent shall provide, not later than **10 days** after the effective date of this City Order, written notice to EPA's Remedial Project Manager ("RPM") stating whether Respondent will comply with the terms of this City Order. If Respondent does not perform the Work, EPA may seek to enforce the terms of this City Order pursuant to Sections 106(b) and 107(c)(3) of CERCLA. Respondent's written notice shall describe, using facts that exist on or prior to the effective date of this City Order, any "sufficient cause" defenses asserted by Respondent under Sections 106(b) and 107(c)(3) of CERCLA. The absence of a response by EPA to the notice required by this Paragraph shall not be deemed to be acceptance of Respondent's assertions.

VIII. PARTIES BOUND

1. This Order shall apply to and be binding upon Respondent and its successors, and assigns. Any change in corporate jurisdiction, boundaries, or form of governance, shall in no way

alter Respondent's responsibilities under this Order. No change in ownership of the Sullivan Landfill shall alter the Respondent's responsibilities under this Order.

2. Respondent shall provide a copy of this Order to each contractor, sub-contractor, laboratory, or consultant retained to perform any Work under this Order, within **5 days** after the effective date pursuant to Section XXVIII of this Order or on the date such services are retained, whichever date occurs later. Respondent shall also provide a copy of this Order to each person representing Respondent with respect to the Site or the Work and shall condition all contracts and subcontracts entered into hereunder upon performance of the Work in conformity with the terms of this Order. With regard to the activities undertaken pursuant to this Order, each contractor and subcontractor shall be deemed to be related by contract to Respondent within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. §9607(b)(3). Notwithstanding the terms of any contract, Respondent is responsible for compliance with this Order and for ensuring that contractors, subcontractors and agents comply with this Order, and perform any Work in accordance with this Order.

3. Respondent is jointly and severally liable for carrying out all Work required by this City Order, the Meramec Order and the Settlement Agreement. Compliance or noncompliance by one or more of the Respondents to the Meramec Order or Settlement Agreement with any provision therein shall not excuse or justify noncompliance with this City Order by Respondent. In the event of the insolvency or other failure of any one or more of the Respondents to implement the requirements of the Meramec Order or Settlement Agreement, Respondent City shall complete all such requirements.

IX. WORK TO BE PERFORMED

1. EPA has entered into an AOC with TRW which requires TRW to conduct the same response actions as those required by this Order. Contemporaneously with the issuance of this City Order, EPA is issuing a parallel Order to Meramec. Respondent to this City Order shall

make best efforts to coordinate with TRW and Meramec in the performance of the Work. Best efforts to coordinate shall include, at a minimum:

(a) Communication in writing within 10 days of the effective date of this Order to the Performing Party(ies) as to City's desire to comply with this City Order and to participate in the performance of the Work or, in lieu of performance, to pay for the performance of the Work;

(b) submission by City within 20 days of the effective date of this City Order of a good-faith offer to the Performing Party(ies) to perform the Work, in whole or in part, or in lieu of performance to pay for the Work, in whole or in part; and

(c) engaging in good-faith negotiations with the Performing Party(ies) to perform or, in lieu of performance, to pay for the Work required by this City Order if such Performing Party(ies) refuses the City's first offer.

2. To the extent that the Performing Party(ies) is performing or has stated an intent to perform any requirement of this City Order, pursuant to any other order or agreement, City shall make best efforts to participate in the performance of the Work with the Performing Party(ies). Best efforts to participate by City shall include, at minimum:

(a) performance of the Work as agreed by City and the Performing Party(ies) to be undertaken by City; and

(b) payment of all amount as agreed by City and the Perfroming Party(ies) to be paid by City if, in lieu of performance, City has offered to pay for the Work required by this Order, in whole or in part.

3. City shall provide EPA with notice of its intent to comply with this Order, consistent with Section VII (Notice of Intent to Comply). In addition, Respondent shall notify EPA in

writing within 5 days of the rejection, if any, by Performing Party(ies) of City's offer to perform or, in lieu of performance, to pay for the Work.

4. The undertaking or completion of any requirement of this Order by any other person, with or without the participation of City, shall not relieve City of its obligation to perform each and every other requirement of this Order.

5. Any failure to perform, in whole or in part, any requirement of this Order by any person with whom City is coordinating or participating in the performance of such requirement shall not relieve City of its obligation to perform each and every requirement of this Order.

6. The following Work provisions of Section IX (Work to be Performed) of this City Order require the same Work as the provisions in the Settlement Agreement with TRW (Paragraphs 26-32 of the Settlement Agreement; Paragraphs 7-13 of this Order). The Effective Date of the Settlement Agreement is September 28, 2009, so dates for performance of the Work shall be calculated from that Effective Date:

7. Activities and Deliverables. Respondent shall conduct activities and submit plans, reports or other deliverables as provided by the attached SOW, which is incorporated by reference, for the development of the RI/FS. All such Work shall be conducted in accordance with the provisions of the Settlement Agreement, the SOW, CERCLA, the NCP, and EPA guidance, including, but not limited to, the "Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (OSWER Directive # 9355.3-01, October 1988 or subsequently issued guidance), "Guidance for Data Useability in Risk Assessment" (OSWER Directive #9285.7-05, October 1990 or subsequently issued guidance), and guidance referenced therein, and guidances referenced in the SOW, as may be amended or modified by EPA. The general activities that Respondent is required to perform are identified below, followed by a list of plans, reports, and other deliverables. The tasks that Respondent must perform are described more fully in the SOW and guidances. The activities, plans, reports and other deliverables identified below shall be developed as provided in the RI/FS Work Plan and

Sampling and Analysis Plan, and shall be submitted to EPA's Project Coordinator and the State. All Work performed under this Order shall be in accordance with the schedules herein or established in the SOW, and in full accordance with the standards, specifications, and other requirements of the RI/FS Work Plan and Sampling and Analysis Plan, as initially approved or modified by EPA, and as may be amended or modified by EPA from time to time. In accordance with the schedules established in the Settlement Agreement or in the SOW, Respondent shall submit 2 copies to EPA, and 1 copy to the State, of all plans, reports, and other deliverables required under the Settlement Agreement, the SOW, and the RI/FS Work Plan. All plans, reports, and other deliverables will be reviewed and approved by EPA. Upon EPA's request, Respondent shall also provide copies of plans, reports or other deliverables to Community. Upon EPA's request, Respondent shall submit in electronic form all portions of any plan, report or other deliverable Respondent are required to submit pursuant to provisions of the Settlement Agreement.

a. Scoping. EPA will determine the Site-specific objectives of the RI/FS and devise a general management approach for the Site, as stated in the attached SOW. Respondent shall conduct the remainder of scoping activities as described in the attached SOW and referenced guidances. At the conclusion of the project planning phase, Respondent shall provide EPA with the following plans, reports and other deliverables:

(1) RI/FS Work Plan. Within **60** days after the Effective Date of the Settlement Agreement, Respondent shall submit to EPA a complete RI/FS Work Plan. Upon its approval by EPA pursuant to Section X (EPA Approval of Plans and Other Submissions), the RI/FS Work Plan shall be incorporated into and become enforceable under this Order.

(2) Sampling and Analysis Plan. Within **60** days after the Effective Date of the Settlement Agreement, Respondent shall submit a Sampling and Analysis Plan to EPA for review and approval. This plan shall consist of a Field Sampling Plan ("FSP") and a Quality Assurance Project Plan ("QAPP"), as described in the Statement of Work and guidances, including, without limitation, "EPA Guidance for Quality Assurance Project Plans (QA/G-

5)"(EPA/600/R-02/009, December 2002 or subsequently issued guidance), and "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" (EPA 240/B-01/003, March 2001 or subsequently issued guidance). Upon its approval by EPA, the Sampling and Analysis Plan shall be incorporated into and become enforceable under this Order.

(3) Site Health and Safety Plan. Within **60** days after the Effective Date of the Settlement Agreement, Respondent shall submit for EPA review and comment a Site Health and Safety Plan that ensures the protection of on-site workers and the public during performance of on-site Work under this Order. This plan shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992 or subsequently issued guidance). In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 C.F.R. Part 1910. If EPA determines that it is appropriate, the plan shall also include contingency planning. Respondent shall incorporate all changes to the plan recommended by EPA and shall implement the plan during the pendency of the RI/FS.

b. Community Relations Plan EPA will prepare a community relations plan, in accordance with EPA guidance and the NCP. As requested by EPA, Respondent shall provide information supporting EPA's community relations plan and shall participate in the preparation of such information for dissemination to the public and in public meetings which may be held or sponsored by EPA to explain activities at or concerning the Site.

c. Phased Site Characterization. Following EPA approval or modification of the RI/FS Work Plan and Sampling and Analysis Plan, Respondent shall implement the provisions of the plans to characterize the Site. Respondent shall complete Phase 1 Site characterization and submit all plans, reports and other deliverables in accordance with the schedules and deadlines established in the Settlement Agreement, the SOW, and/or the EPA-approved RI/FS Work Plan and Sampling and Analysis Plan.

EPA will determine whether the Phase 1 Preliminary Site Characterization Summary has adequately characterized the Site. If EPA determines that additional Work is required to adequately characterize the Site, within **60** days after EPA's notice describing such additional Work, Respondent shall submit to EPA a Draft Phase 2 Site Characterization Work Plan. Respondent shall thereafter implement the Work as required by the approved Work Plan.

d. Baseline Human Health Risk Assessment and Ecological Risk Assessment. Respondent will perform the Baseline Human Health Risk Assessment and Ecological Risk Assessment ("Risk Assessments") in accordance with the SOW, RI/FS Work Plan, and applicable EPA guidance, including but not limited to: "Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part A)," (RAGS, EPA-540-1-89-002, OSWER Directive 9285.7-01A, December 1989); "Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)," (RAGS, EPA 540-R-97-033, OSWER Directive 9285.7-01D, January 1998); "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments" (ERAGS, EPA-540-R-97-006, OSWER Directive 9285.7-25, June 1997) or subsequently issued guidance.

e. Draft Remedial Investigation Report. Within **60** days after EPA's approval of the Risk Assessments, Respondent shall submit to EPA a Draft Remedial Investigation Report consistent with the SOW, RI/FS Work Plan, and Sampling and Analysis Plan. The Draft RI Report shall also contain the Risk Assessments.

f. Treatability Studies. Respondent shall conduct treatability studies, except where Respondent can demonstrate to EPA's satisfaction that they are not needed. The major components of the treatability studies are described in the SOW. In accordance with the schedules or deadlines established in the Settlement Agreement, the SOW and/or the EPA-approved RI/FS Work Plan, Respondent shall provide EPA with the following plans, reports, and other deliverables:

(1) Identification of Candidate Technologies Memorandum. This memorandum shall be submitted within **60** days of the effective date of the Settlement Agreement.

(2) Treatability Testing Work Plan. If EPA determines that treatability testing is required, within 30 days after EPA provides notice to the Respondent, Respondent shall submit a Treatability Testing Work Plan, including a schedule.

(3) Treatability Study Sampling and Analysis Plan. Within **30** days after identification of the need for a separate or revised QAPP or FSP, Respondent shall submit a Treatability Study Sampling and Analysis Plan.

(4) Treatability Study Site Health and Safety Plan. Within **30** days after the identification of the need for a revised Health and Safety Plan, Respondent shall submit a Treatability Study Site Health and Safety Plan.

(5) Treatability Study Evaluation Report. Within **45** days after completion of any treatability testing, Respondent shall submit a treatability study evaluation report as provided in the Statement of Work and Work Plan.

g. Development and Screening of Alternatives. Respondent shall develop an appropriate range of waste management options that will be evaluated through the development and screening of alternatives, as provided in the SOW and RI/FS Work Plan. In accordance with the schedules or deadlines established in this Order, the SOW and/or the EPA-approved RI/FS Work Plan, Respondent shall provide EPA with the following deliverables:

(1) Memorandum on Remedial Action Objectives. The Memorandum on Remedial Action Objectives shall include remedial action objectives for Engineering Controls as well as for Institutional Controls.

(2) Memorandum on Development and Screening of Alternatives. The Memorandum shall summarize the development and screening of remedial alternatives

h. Detailed Analysis of Alternatives. Respondent shall conduct a detailed analysis of remedial alternatives, as described in the SOW and RI/FS Work Plan. In accordance with the deadlines or schedules established in the Settlement Agreement, the SOW and/or the EPA-approved RI/FS Work Plan Respondent shall provide EPA with the following deliverables and presentation for review and approval:

(1) Alternatives Analysis for Institutional Controls. Respondent shall submit a memorandum on the Institutional Controls identified as potential remedial actions. The Alternatives Analysis for Institutional Controls shall (1) state the objectives (i.e., what will be accomplished) for the Institutional Controls; (2) determine the specific types of Institutional Controls that can be used to meet the remedial action objectives; (3) investigate when the Institutional Controls need to be implemented and/or secured and how long they must be in place; and (4) research, discuss and document any agreement with the proper entities (e.g., state, local government entities, local landowners, conservation organizations, Respondent) on exactly who will be responsible for securing, maintaining and enforcing the Institutional Controls. The Alternatives Analysis for Institutional Controls shall also evaluate the Institutional Controls identified against the nine evaluation criteria outlined in the NCP (40 C.F.R. 300.430(e)(9)(iii)) for CERCLA cleanups, including but not limited to costs to implement, monitor and/or enforce the Institutional Controls. The Alternatives Analysis for Institutional Controls shall be submitted as an appendix to the Draft Feasibility Study Report.

(2) Draft Feasibility Study Report. Along with the RI Report, Respondent shall submit to EPA a Draft Feasibility Study Report which reflects the findings in the Risk Assessments. Respondent shall refer to Table 6-5 of the RI/FS Guidance for report content and format. The report as amended, and the administrative record, shall provide the basis for the proposed plan under CERCLA Sections 113(k) and 117(a) by EPA, and shall document the development and analysis of remedial alternatives.

8. Upon receipt of the draft FS report, EPA will evaluate, as necessary, the estimates of the risk to the public and environment that are expected to remain after a particular remedial alternative has been completed and will evaluate the durability, reliability and effectiveness of any proposed Institutional Controls.

9. Modification of the RI/FS Work Plan.

a. If at any time during the RI/FS process, Respondent identifies a need for additional data, Respondent shall submit a memorandum documenting the need for additional data to the EPA Project Coordinator within **20** days of identification. EPA in its discretion will determine whether the additional data will be collected by Respondent and whether it will be incorporated into plans, reports and other deliverables.

b. In the event of unanticipated or changed circumstances at the Site, Respondent shall notify the EPA Project Coordinator by telephone within 24 hours of discovery of the unanticipated or changed circumstances. In the event that EPA determines that the immediate threat or the unanticipated or changed circumstances warrant changes in the RI/FS Work Plan, EPA shall modify or amend the RI/FS Work Plan in writing accordingly. Respondent shall perform the RI/FS Work Plan as modified or amended.

c. EPA may determine that in addition to tasks defined in the initially approved RI/FS Work Plan, other additional Work (additional Phases) may be necessary to accomplish the objectives of the RI/FS.

d. Respondent shall confirm its willingness to perform the additional Work in writing to EPA within **7** days of receipt of the EPA request. The SOW and/or RI/FS Work Plan shall be modified in accordance with the final resolution of the dispute.

e. Respondent shall complete the additional Work according to the standards, specifications, and schedule set forth or approved by EPA in a written modification to the RI/FS

Work Plan or written RI/FS Work Plan supplement. EPA reserves the right to conduct the Work itself at any point, to seek reimbursement from Respondent, and/or to seek any other appropriate relief.

f. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions at the Site.

10. Off-Site Shipment of Waste Material. Respondent shall, prior to any off-site shipment of Waste Material from the Site to an out-of-state waste management facility, provide written notification of such shipment of Waste Material to the appropriate state environmental official in the receiving facility's state and to EPA's Designated Project Coordinator. However, this notification requirement shall not apply to any off-site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

a. Respondent shall include in the written notification the following information: (1) the name and location of the facility to which the Waste Material is to be shipped: (2) the type and quantity of the Waste Material to be shipped; (3) the expected schedule for the shipment of the Waste Material; and (4) the method of transportation. Respondent shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

b. The identity of the receiving facility and state will be determined by Respondent following the award of the contract for the remedial investigation and feasibility study. Respondent shall provide the information required by Subparagraphs (a) and (c) of this Paragraph as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

c. Before shipping any hazardous substances, pollutants, or contaminants from the Site to an off-site location, Respondent shall obtain EPA's certification that the proposed

receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence.

11. Meetings. Respondent shall make presentations at, and participate in, meetings at the request of EPA during the initiation, conduct, and completion of the RI/FS. In addition to discussion of the technical aspects of the RI/FS, topics will include anticipated problems or new issues. Meetings will be scheduled at EPA's discretion.

12. Progress Reports. Respondent shall provide progress reports under this Order as provided in Section XIII.

13. Emergency Response and Notification of Releases.

a. In the event of any action or occurrence during performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action. Respondent shall take these actions in accordance with all applicable provisions of this Order, including, but not limited to, the Health and Safety Plan, in Order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondent shall also immediately notify the EPA Project Coordinator or, in the event of his/her unavailability, the On Scene Coordinator ("OSC") or the Regional Duty Officer at the EPA Regional Emergency 24-hour telephone number: 913-281-0991 of the incident or Site conditions. In the event that Respondent fails to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Respondent shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XXIII of this Order.

b. In addition, in the event of any release of a hazardous substance from the Site, Respondent shall immediately notify the EPA Project Coordinator, the OSC or Regional Duty Officer at 913-281-0991 and the National Response Center at (800) 424-8802. Respondent shall submit a written report to EPA within 7 days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, *et seq*.

X. EPA APPROVAL OF PLANS AND OTHER SUBMISSIONS

1. After review of any plan, report or other item that is required to be submitted for approval pursuant to this Order, in a notice to Respondent EPA may: (a) approve, in whole or in part, the submission; (b) approve the submission upon specified conditions; (c) modify the submission to cure the deficiencies; (d) disapprove, in whole or in part, the submission, directing that Respondent modify the submission; or (e) any combination of the above.

2. In the event of approval, approval upon conditions, or modification by EPA, pursuant to Subparagraph (a), (b), (c) or (e) of the preceding paragraph, Respondent shall proceed to take any action required by the plan, report or other deliverable, as approved or modified by EPA. Following EPA approval or modification of a submission or portion thereof, Respondent shall not thereafter alter or amend such submission or portion thereof unless directed by EPA. In the event that EPA modifies the submission to cure the deficiencies pursuant to Subparagraph (c) and the submission had a material defect, the Respondent's failure to produce an adequate plan, report or other deliverable nevertheless constitutes a failure to comply this Order.

3. Resubmission.

a. Upon receipt of a notice of disapproval, Respondent shall, within **20 days** or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the plan, report, or other deliverable for approval.

b. Notwithstanding the receipt of a notice of disapproval, Respondent shall proceed to take any action required by any non-deficient portion of the submission, unless otherwise directed by EPA. Implementation of any non-deficient portion of a submission shall not relieve Respondent of any liability for penalties for violation of this Order.

c. Respondent shall not proceed further with any subsequent activities or tasks until receiving EPA approval, approval on condition or modification of the following deliverables: RI/FS Work Plan and Sampling and Analysis Plan, Draft Remedial Investigation Report and Treatability Testing Work Plan and Sampling and Analysis Plan and Draft Feasibility Study Report. While awaiting EPA approval, approval on condition or modification of these deliverables, Respondent shall proceed with all other tasks and activities which may be conducted independently of these deliverables, in accordance with the schedule set forth under this Order.

d. For all remaining deliverables not listed above in Subparagraph 3(c), Respondent shall proceed with all subsequent tasks, activities and deliverables without awaiting EPA approval on the submitted deliverable.

4. If EPA disapproves a resubmitted plan, report or other deliverable, or portion thereof, EPA may again direct Respondent to correct the deficiencies. EPA shall also retain the right to modify or develop the plan, report or other deliverable. Respondent shall implement any such plan, report, or deliverable as corrected, modified or developed by EPA.

5. If upon resubmission, a plan, report, or other deliverable is disapproved or modified by EPA due to a material defect, Respondent shall be deemed to have failed to submit such plan, report, or other deliverable in a timely manner.

6. All plans, reports, and other deliverables submitted to EPA under this Order Agreement shall, upon approval or modification by EPA, be incorporated into and enforceable under this Order. In the event EPA approves or modifies a portion of a plan, report, or other deliverable submitted to EPA under this Order, the approved or modified portion shall be incorporated into and enforceable under this Order.

7. Neither failure of EPA to expressly approve or disapprove of Respondent's submissions within a specified time period, nor the absence of comments, shall be construed as approval by EPA. Whether or not EPA gives express approval for Respondent's deliverables, Respondent is responsible for preparing deliverables acceptable to EPA.

XI. ADDITIONAL RESPONSE ACTIONS

If EPA determines that additional response actions necessary to complete the remedial investigation/feasibility study are not included in a plan approved under this Order and such additional response actions are necessary to protect public health, welfare, or the environment, EPA will notify Respondent of that determination. Unless otherwise stated by EPA, within **15 days** of receipt of notice from EPA that additional response actions are necessary to protect public health, welfare, or the environment, Respondent shall submit for approval by EPA a Work Plan for the additional response actions. The plan shall conform to the applicable requirements of this Order and the SOW to this Order. Upon EPA's approval of the plan, Respondent shall implement the plan for additional response actions in accordance with the provisions and schedule contained therein. This Section does not alter or diminish the RPM's authority to make modifications to any plan or schedule pursuant to Section X of this Order.

XII. FINAL REPORTS, PROPOSED PLANS, RECORD OF DECISION AND ADMINISTRATIVE RECORD

1. EPA shall be responsible for the release to the public of the final reports on the RI/FS. EPA shall be responsible for the preparation and release to the public of the proposed plan and Record of Decision in accordance with CERCLA and the NCP.

2. EPA will determine the contents of the Administrative Record file for selection of any response action. Respondent must submit to EPA all documents concerning the Site, developed during the course of the RI/FS which must be included in the Administrative Record file.

XIII. PROGRESS REPORTS

In addition to the deliverables set forth in this Order, Respondent shall provide to EPA monthly progress reports no later than the 10th day of the following month. At a minimum, with respect to the preceding month, these progress reports shall: (1) describe the actions which have been taken to comply with this Order during that month; (2) include all results of sampling and tests and all other data received by Respondent; (3) describe work planned for the next two months with schedules relating such work to the overall project schedule for the Work; and (4) describe all problems encountered and any anticipated problems, any actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

XIV. QUALITY ASSURANCE, SAMPLING, AND ACCESS TO INFORMATION

1. Quality Assurance. Respondent shall assure that Work performed, samples taken and analyses conducted conform to the requirements of the SOW, the QAPP and guidances identified therein. Respondent will assure that field personnel used by Respondent are properly trained in the use of field equipment and in chain of custody procedures. Respondent shall only use laboratories which have a documented quality system that complies with "EPA Requirements

for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001) or equivalent documentation as determined by EPA.

2. Sampling.

a. All results of sampling, tests, modeling or other data (including raw data) generated by Respondent, or on Respondent's behalf, during the period that this Order is effective, shall be submitted to EPA in the next monthly progress report as described in Section XIII of this Order. EPA will make available to Respondent validated data generated by EPA unless it is exempt from disclosure by any federal or state law or regulation.

b. Respondent shall verbally notify EPA, and the State, at least **20** days prior to conducting significant field events as described in the SOW, RI/FS Work Plan or Sampling and Analysis Plan. At EPA's verbal or written request, or the request of EPA's oversight assistant, Respondent shall allow split or duplicate samples to be taken by EPA (and its authorized representatives), or the State of any samples collected in implementing this Order. All split samples of Respondent shall be analyzed by the methods identified in the QAPP.

3. Access to Information.

a. Respondent shall provide to EPA, and the State, upon request, copies of all documents and information within their possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Order, 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 related to the Work. Respondent shall also make available to EPA and the State, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

b. Respondent may assert business confidentiality claims covering part or all of the documents or information submitted to EPA and the State under this Order 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). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when it is submitted to EPA and the State, or if EPA has notified Respondent that the documents or information 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 documents or information without further notice to Respondent. Respondent shall segregate and clearly identify all documents or information submitted under this Order for which Respondent asserts business confidentiality claims.

c. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Respondent asserts such a privilege in lieu of providing documents, they shall provide EPA and the State with the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the name and title of the author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the contents of the document, record, or information; and (6) the privilege asserted by Respondent. However, no documents, reports or other information created or generated pursuant to the requirements of this Order shall be withheld on the grounds that they are privileged.

d. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

4. Respondent shall not object to any data gathered, generated, or evaluated by EPA, the State or a Performing Party(ies) in the performance or oversight of the Work that has been verified according to the quality assurance/quality control ("QA/QC") procedures required by this

Order or any EPA-approved RI/FS Work Plans or Sampling and Analysis Plans. If Respondent objects to any other data relating to the RI/FS, Respondent shall submit to EPA a report that specifically identifies and explains its objections, describes the acceptable uses of the data, if any, and identifies any limitations to the use of the data. The report must be submitted to EPA within **15** days of the monthly progress report containing the data.

XV. RECORD PRESERVATION

Respondent shall preserve all records and documents in its possession that relate in any way to the Site during the conduct of Work required by this Order and for a minimum of 10 years after commencement of construction of any response action. Respondent shall acquire and retain copies of all documents that relate to the site and are in the possession of its employees, agents, accountants, contractors, or attorneys. After this 10 year period, Respondent shall notify EPA at least 90 days before the documents are scheduled to be destroyed. If EPA requests that the documents be saved, Respondent shall, at no cost to EPA, give EPA the documents or copies of the documents.

XVI. ENDANGERMENT AND EMERGENCY RESPONSE

1. In the event of any action or occurrence during the performance of the Work which causes or threatens to cause a release of a hazardous substance or which may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action to prevent, abate, or minimize the threat, and shall immediately notify EPA's RPM. If the RPM is unavailable Respondent shall notify the EPA Office of Emergency Response, Region 7 Duty Officer at (800) 424-8802 or (206) 553-1263 of the incident or Site conditions. Respondent shall take such action in consultation with EPA's RPM and in accordance with all applicable provisions of this Order, including but not limited to the Health and Safety Plan. In the event that Respondent fails to take appropriate response action as required by this Section, and EPA takes that action instead, EPA reserves the right to seek reimbursement from Respondent for all costs incurred by the United States.

2. In addition, in the event of any reportable release of a hazardous substance from the Site, Respondent shall immediately notify the Emergency Response Duty OSC at (913) 281-0991 and the National Response Center at (800) 424-8802. Respondent shall submit a written report to EPA within **7 days** after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, *et seq.*

3. Nothing in the preceding Paragraph shall be deemed to limit any authority of the United States to take, direct, or order all appropriate action to protect human health and the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances on, at, or from the Site.

XVII. COMPLIANCE WITH APPLICABLE LAWS

1. All activities by Respondent pursuant to this Order shall be performed in accordance with the requirements of all federal and state laws and regulations. EPA has determined that the activities contemplated by this Order are consistent with the NCP.

2. Respondent shall perform all actions required pursuant to this Order in accordance with all applicable local, tribal, state, and federal laws and regulations except as provided in CERCLA section 121(e) and 40 C.F.R. section 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-site actions required pursuant to this Order 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, state environmental, tribal environmental, or facility siting laws. Respondent shall identify ARARs in the Work Plan subject to EPA approval.

3. This Order is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

XVIII. REMEDIAL PROJECT MANAGER

1. All communications, whether written or oral, from Respondent to EPA shall be directed to EPA's RPM:

EPA's RPM is: Tonya Howell
EPA Project Coordinator
Superfund Division
U.S. Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas, 66101

(913) 551-7589
tonya.howell@epa.gov

2. EPA has the unreviewable right to change its RPM. If EPA changes its RPM, EPA will inform Respondent in writing of the name, address, and telephone number of the replacement RPM.

3. EPA's RPM shall have the authority lawfully vested in the RPM, by the National Contingency Plan, 40 C.F.R. Part 300. EPA's RPM shall have authority, consistent with the National Contingency Plan, to halt any work required by this Order, and to take any necessary response action.

XIX. FINANCIAL ASSURANCE

1. Within 30 days of the Effective Date, Respondent shall establish and maintain financial security in the amount of the estimated cost of the Work of $700,000 in one or more of the following forms, in order to secure full and final completion of Work by Respondent:

a. A surety bond unconditionally guaranteeing payment and/or performance of the Work;

b. One or more irrevocable letters of credit, payable to or at the direction of EPA, issued by a financial institution(s) acceptable in all respects to EPA, equaling the total estimated cost of the Work;

c. A trust fund administered by a trustee acceptable in all respects to EPA;

d. A policy of insurance issued by an insurance carrier acceptable in all respects to EPA, which ensures the payment and/or performance of the Work;

e. A corporate guarantee to perform the Work provided by one or more unrelated corporations that have a substantial business relationship with at least one Respondent; including a demonstration that any such company satisfies the financial test requirements of 40 C.F.R Sec. 264.143(f); and/or

f. A corporate guarantee to perform the Work by one or more of Respondents, including a demonstration that any such Respondent satisfies the requirements of 40 C.F.R. Sec. 264.143(f).

2. Any and all financial assurance instruments provided pursuant to this Section shall be in form and substance satisfactory to EPA, determined in EPA's sole discretion. In the event that EPA determines at any time that the financial assurances provided pursuant to this Section (including, without limitation, the instrument(s) evidencing such assurances) are inadequate, Respondent shall, within **30 days** of receipt of notice of EPA's determination, obtain and present to EPA for approval one of the other forms of financial assurance listed in Paragraph 1, above. In addition, if at any time EPA notifies Respondent that the anticipated cost of completing the Work has increased, then, within **30 days** of such notification, Respondent shall obtain and present to EPA for approval a revised form of financial assurance (otherwise acceptable under this Section) that reflects such cost increase. Respondent's inability to demonstrate financial ability to

complete the Work shall in no way excuse nonperformance of any activities required under this Order.

3. If Respondent seeks to ensure completion of the work through a guarantee pursuant to Subparagraphs 1.e. or 1.f above, Respondent shall (i) demonstrate to EPA's satisfaction that the guarantor satisfies the requirements of 40 C.F.R. Sec. 264.143(f); and (ii) resubmit sworn statements conveying the information required by 40 C.F.R. Sec. 264.143(f) annually, on the anniversary of the Effective Date, to EPA. For the purposes of this Order, wherever 40 C.F.R. Sec. 264.143(f) references "sum of current closure and post-closure costs estimates and the current plugging and abandonment costs estimate," the current cost estimate for the Work at the Site shall be used in relevant financial test calculations.

4. Any and all financial assurance instruments provided pursuant to this Section shall provide EPA with immediate access to resources, whether in cash or in kind, to continue and complete the Work in the event EPA determines that Respondent (i) have ceased implementation of any portion of the Work, (ii) are significantly or repeatedly deficient or late in their performance of the Work, or (iii) are implementing the Work in a manner which may cause an endangerment to human health or the environment. In the event that EPA determines that one or more of the circumstances described in clauses (i), (ii) or (iii) of this Paragraph have occurred, EPA shall have the right to immediately access any and all financial assurance instruments provided pursuant to this Section. If EPA is nevertheless unable after reasonable efforts to secure the resources (whether in cash or in kind) necessary to continue and complete the Work from the financial assurance instrument(s) posted by Respondent pursuant to this Section, then, in such event, and upon receiving written notice from EPA, Respondent shall immediately deposit into an account specified by EPA, in immediately available funds and without setoff, counterclaim, or condition of any kind, a cash amount up to but not exceeding the estimated cost of the remaining Work to be performed as of such date, as determined by EPA.

5. If, after the Effective Date, Respondent can show that the estimated cost to complete the remaining Work has diminished below the amount of the previously estimated cost of the Work,

Respondent may, on any anniversary date of the Effective Date, or at any other time agreed to by EPA, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining Work to be performed. Respondent shall submit a proposal for such reduction to EPA, in accordance with the requirements of this Section, and may reduce the amount of the security after receiving written approval from EPA.

XX. WORK TAKEOVER

1. In the event EPA determines that Respondent has (i) ceased implementation of any portion of the Work, or (ii) is seriously or repeatedly deficient or late in its performance of the Work, or (iii) is implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may issue a written notice ("Work Takeover Notice") to the Respondent. Any Work Takeover Notice issued by EPA will specify the grounds upon which such notice was issued and will provide Respondent a period of 10 days within which to remedy the circumstances giving rise to EPA's issuance of the notice.

2. If, after expiration of the 10-day notice period specified in the preceding Paragraph, Respondent has not remedied to EPA's satisfaction the circumstances giving rise to EPA's issuance of the Work Takeover Notice, EPA may at any time thereafter assume the performance of all or any portion of the Work as EPA deems necessary ("Work Takeover"). EPA will notify Respondent in writing (which may be electronic in form) if EPA determines that implementation of the Work Takeover is warranted under this Section.

3. After commencement and for the duration of any Work Takeover, EPA shall have immediate access to and benefit of financial assurance provided pursuant to Section XIX (Financial Asurance) of this Order. If and to the extent EPA is unable to secure the resources guaranteed under any financial assurance and the Respondent fails to remit a cash amount up to, but not exceeding, the estimated cost of the remaining Work to be performed, any unreimbursed costs incurred by EPA in performing Work under the Work Takeover shall be considered Oversight

Costs that Respondent shall pay pursuant to Section XXIII. (Reimbursement of EPA's Oversight Costs) of this Order.

XXI. INSURANCE

Prior to commencing any On-Site Work under this Order, Respondent shall secure, and shall maintain for the duration of this Order, comprehensive general liability insurance and automobile insurance with limits of **one** million dollars, combined single limit, naming the EPA as an additional insured. Within the same period, Respondent shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondent shall submit such certificates and copies of policies each year on the anniversary of the Effective Date. In addition, for the duration of the Work, Respondent shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Respondent in furtherance of this Order. If Respondent demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondent need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXII. UNITED STATES NOT LIABLE

The United States, by issuance of this Order, assumes no liability for any injuries or damages to persons or property resulting from acts or omissions by Respondent, or Respondent's directors, officers, employees, agents, representatives, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order. Neither EPA nor the United States may be deemed to be a party to any contract entered into by Respondent or its directors, officers, employees, agents, successors, assigns, contractors, or consultants in carrying out any action or activity pursuant to this Order.

XXIII. REIMBURSEMENT OF EPA'S OVERSIGHT COSTS

Respondent shall reimburse EPA, upon written demand, for all Oversight Costs incurred by the United States in overseeing Respondent's implementation of the requirements of this Order. EPA may submit to Respondent on a periodic basis a bill for Oversight Costs incurred by the United States with respect to this Order. EPA's Regional Cost Summary, or similar document prepared by EPA, shall serve as the basis for payment demands. Respondent shall, within **30 days** of receipt of the bill, remit a cashiers or certified check for the amount of the bill. All payments to EPA under this Section shall be paid by certified or cashier's check(s) made payable to "EPA Hazardous Substances Superfund," and shall be mailed to:

U.S. EPA
Superfund Payments
Cincinnati Finance Center
P.O. Box 979076
St. Louis, MO 63197-9000,

and shall reference the EPA Region and Site/Spill ID Number 07PZOU2, the EPA Docket Number CERCLA-07-2009-0016, and the name and address of the party(ies) making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s) shall be sent to EPA's Project Coordinator.

XXIV. ENFORCEMENT AND RESERVATIONS

1. EPA reserves the right to bring an action against Respondent under Section 107 of CERCLA, 42 U.S.C.§ 9607, for recovery of any response costs incurred by the United States related to the Site and not reimbursed by Respondent. This reservation shall include but not be limited to past costs, future costs, direct costs, indirect costs, the costs of oversight, the costs of compiling the cost documentation to support oversight cost demand, as well as accrued interest as provided in Section 107(a) of CERCLA.

2. Notwithstanding any other provision of this Order, at any time during the response action, EPA may perform its own studies, complete the response action (or any portion of the response action) as provided in CERCLA and the NCP, and seek reimbursement from Respondent for EPA's costs, or seek any other appropriate relief.

3. Nothing in this Order shall preclude EPA from taking any additional enforcement actions, including modification of this Order or issuance of additional Orders, and/or additional remedial or removal actions as EPA may deem necessary, or from requiring Respondent in the future to perform additional activities pursuant to CERCLA, 42 U.S.C. § 9606(a), et seq., or any other applicable law. Respondent shall be liable under CERCLA Section 107(a), 42 U.S.C. § 9607(a), for the costs of any such additional actions.

4. Notwithstanding any provision of this Order, the United States hereby retains all of its information gathering, inspection and enforcement authorities and rights under CERCLA, RCRA and any other applicable statutes or regulations.

5. As provided in Section 106(b) of CERCLA, 42 U.S.C. § 9606(b), any person who, without sufficient cause, willfully violates, or fails or refuses to comply with, any order of the President under Section 106(a) may, in an action brought in the appropriate United States district court to enforce such order, be fined not more that $37,500 for each day in which such violation occurs or such failure to comply continues. Moreover, under Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3), "[i]f any person who is liable for a release or threat of release of a hazardous substance fails without sufficient cause to properly provide removal or remedial action upon order of the President pursuant to section 9604 or 9606 of this title, such person may be liable to the United States for punitive damages in an amount at least equal to, and not more than three times, the amount of any costs incurred by the Fund as a result of such failure to take proper action."

6. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action or demand in law or equity against any person for any liability it may have arising out of or relating in any way to the Site.

7. If a court issues an order that invalidates any provision of this Order or finds that Respondent has sufficient cause not to comply with one or more provisions of this Order, Respondent shall remain bound to comply with all provisions of this Order not invalidated by the court's order.

XXV. SITE ACCESS

1. If the Site, or any other property where access is needed to implement this Order, is owned or controlled by Respondent, Respondent shall, commencing on the Effective Date, provide EPA, the State, Meramec, TRW and their representatives, including contractors, with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this Order.

2. Where any action under this Order is to be performed in areas owned by or in possession of someone other than Respondent, Respondent shall use best efforts to obtain all necessary access agreements within **60** days after the Effective Date, or as otherwise specified in writing by the EPA Project Coordinator. Respondent shall immediately notify EPA if after using their best efforts they are unable to obtain such agreements. For purposes of this Paragraph, "best efforts" includes the payment of reasonable sums of money in consideration of access. Respondent shall describe in writing the efforts to obtain access. If Respondent cannot obtain access agreements, EPA may either (i) obtain access for Respondent or assist Respondent in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as EPA deems appropriate; (ii) perform those tasks or activities with EPA contractors; or (iii) terminate the Order. Respondent shall reimburse EPA for all costs and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XXIII (Reimbursement of EPA's Oversight Costs). If EPA performs those tasks or activities with EPA contractors and does not terminate the Order, Respondent shall perform all other tasks or activities not requiring access to that property, and shall reimburse EPA for all costs incurred in performing such tasks or activities. Respondent shall integrate the results of any such tasks or activities undertaken by EPA into its plans, reports and other deliverables.

3. Notwithstanding any provision of this Order, EPA, and the State, retain all of their access authorities and rights, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

XXVI. ADMINISTRATIVE RECORD

The Administrative Record file supporting these response actions is available for review at EPA Region 7 offices located at 901 North 5th Street, Kansas City, Kansas.

XXVII. OPPORTUNITY TO CONFER

1. Respondent may, before the effective date of this Order, request a conference with EPA to discuss this Order. If requested, the conference shall occur within **7 days** of Respondent's request for a conference.

2. The purpose and scope of the conference shall be limited to issues regarding Respondent's compliance with the Order, implementation of the Work required by this Order and Respondent's intentions with respect to compliance with this Order. This conference is not an evidentiary hearing, and does not constitute a proceeding to challenge this Order. It does not give Respondent rights to seek review of this Order, or to seek resolution of potential liability, and no official stenographic record of the conference will be made. At any conference held pursuant to Respondent's request, Respondent may appear in person or be represented by an attorney(ies) or other representative(s).

3. Requests for a conference must be by telephone or e-mail followed by written confirmation mailed that day to James Stevens, Assistant Regional Counsel, 901 North 5th Street, Kansas City, Kansas 66101; telephone: (913) 551-7322; e-mail: stevens.jim@epa.gov.

XXVIII. EFFECTIVE DATE AND COMPUTATION OF TIME

This Order shall be effective **14 days** after the delivery date listed below, unless a conference is requested as provided herein. . If a conference is requested, this order shall be effective **10 days** after the day of the conference unless modified in writing by EPA.

So ORDERED, this 1st day of October, 2009.

BY: _____
Cecilia Tapia
Director, Superfund Division
Region 7
United States Environmental Protection Agency

TO BE DELIVERED DATE (by Federal Express): 10/5/09

APPRENDIX A - STATEMENT OF WORK
REMEDIAL INVESTIGATION/FEASIBILITY STUDY FOR SULLIVAN LANDFILL
OAK GROVE VILLAGE WELL SUPERFUND SITE, OPERABLE UNIT 2
OAK GROVE VILLAGE, MISSOURI

I. INTRODUCTION

The purpose of this remedial investigation/feasibility study ("RI/FS") is to investigate the nature and extent of contamination attributable to the groundwater from the Sullivan Landfill ("Landfill") at the Oak Grove Village Well Superfund Site ("OGVW Site"), Operable Unit 2 ("OU2") and develop and evaluate potential remedial alternatives. (As used herein "Site" shall have the same definition as the "Site" definition which appears in Section IV of the Administrative Settlement Agreement and Order on Consent for Remedial Investigation/Feasibility Study ("Settlement Agreement") to which this Statement of Work ("SOW") is attached.) The RI and FS are interactive and may be conducted concurrently so that the data collected in the RI may influence the development of remedial alternatives in the FS and the data requirements of the FS may influence the RI sampling activities.

Respondent shall conduct this RI/FS and produce the RI/FS in accordance with this SOW; EPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (Interim Final), EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988 ("RI/FS Guidance"); and any other guidance which EPA uses in conducting an RI/FS (a list of the primary guidances is attached), as well as any additional requirements in the Settlement Agreement. Respondent shall furnish all necessary personnel, services, materials, and equipment required, or incidental, to performing the RI/FS in accordance with all applicable regulations and guidance.

EPA recognizes that numerous studies of the groundwater and hydrology in the vicinity of the Landfill have been prepared. EPA and Respondent agree that this SOW shall be implemented in a manner that recognizes and incorporates past studies and existing data, and avoids duplication of past work or generates data that does not implement the stated goal of this RI/FS: to determine whether groundwater attributable to the Landfill is contributing to contamination and to determine the nature and extent of the contamination to evaluate remedial measures to address such contamination.

At the completion of the RI/FS, EPA is responsible for the selection of a Site remedy and will document this selection in a Record of Decision ("ROD"). The remedial action ("RA") alternative selected by EPA will meet the cleanup standards specified in Section 121 of CERCLA. The selected RA will be protective of human health and the environment, will be in compliance with, or include a waiver of applicable or relevant and appropriate requirements ("ARARs") of other laws, will be cost effective, will utilize permanent solutions and alternative treatment technologies or resource recovery

technologies to the maximum extent practicable, and will address the statutory preference for treatment as a principal element. The final RI/FS Report as adopted by EPA, and the Baseline Risk Assessment will, with the administrative record, form the basis for the selection of the Site's remedy and will provide the information necessary to support the development of the ROD. As specified in Section 104(a)(1) of CERCLA, EPA will provide oversight of Respondent's activities throughout the RI/FS. Respondent will support EPA's initiation and conduct of activities related to the implementation of oversight activities.

II. BACKGROUND

The Missouri Department of Natural Resources ("MDNR") discovered Trichloroethylene ("TCE") contamination in 1986 during routine sampling of the public water supply well for Oak Grove Village ("OGV"). A Preliminary Assessment and Site Inspection were conducted in 1987 and 1988, respectively. EPA completed an Expanded Site Investigation ("ESI") in September 1994.

MDNR began a state-lead RI for the OGVW Site in October 1999. Due to the complicated hydrogeology at the OGVW Site, the RI was conducted in a phased approach. The goal was to determine the nature and extent of contamination. On September 13, 2001, during the Phase I RI, the OGVW Site was proposed for the National Priorities List ("NPL"). The Phase I RI was completed in April 2002. The Phase II RI began in April 2002, and on September 5, 2002, the NPL listing became final. Phase II of the RI was completed in August 2005.

After the completion of Phase II, MDNR and EPA determined that the OGVW Site needed to be addressed as two separate operable units. The RI and ROD for Operable Unit 1 ("OU1") was completed by MDNR in September 2007. The other operable unit, OU2, has been defined by EPA to include areas such as the Landfill, the La Jolla Spring Cave Complex, and any other areas where contamination has come to be located.

Respondent, along with the city of Sullivan and Meramec Industries, Inc., closed the Landfill in accordance with Missouri Department of Natural Resources ("MDNR") landfill closure requirements. The closure activities included removal of over 150 drums from the Landfill, installation of 6 groundwater monitoring wells, and construction of a landfill cap and associated leachate collection system. These activities were completed in 1996. The Landfill cap consists of a composite barrier layer of compacted clay and a synthetic liner. The cap system includes storm water drainage, leachate collection, and gas collection and venting systems. The cap system is monitored as part of the post-closure monitoring of the Landfill.

III. RI TASKS

TASK 1: SCOPING [Chapter 2 - note: bracketed references are to the RI/FS Guidance]

The objectives of the RI/FS for the Landfill are to characterize the nature and extent of contamination, assess the risks posed by this contamination, and to evaluate potential remedial options. The goal is to develop the data necessary to support the selection of a remedial action for the Site. Respondent and EPA agree to conduct this RI/FS in a phased approach. The first phase will include the activities described in Task 3 of this SOW.

Respondent shall analyze and present the data from the initial phase to EPA. EPA will determine the scope of necessary additional data and studies to complete the objectives of the RI/FS for the Landfill.

While scoping the specific aspects of a project, Respondent will confer with EPA to discuss all project planning decisions and special concerns associated with the Site. The following activities shall be performed by Respondent as a function of the project planning process.

A. Site Background [2.2]

Respondent will supplement previous efforts to gather and analyze the existing Site background information to assist in planning the scope of the RI/FS

Before planning the RI/FS activities, existing hydrogeologic and groundwater quality data pertaining to the Landfill and the vicinity of the Landfill will be compiled and reviewed by Respondent. Specifically, this will include presently available data relating to the varieties and quantities of hazardous substances at the Landfill. This will also include results from any previous sampling events. Respondent will refer to Table 2-1 of the RI/FS Guidance for a comprehensive list of data collection information sources. This information will be utilized in determining additional data needed to characterize the contamination attributable to groundwater from the Landfill,, better define potential ARARs, and develop a range of preliminarily identified remedial alternatives. Data Quality Objectives ("DQO") will be established subject to EPA approval. Decisions on the necessary data and DQOs will be made by EPA.

Information on the Site's physiography, hydrology, geology, and natural resource features shall be utilized to scope the project and to determine the extent of additional data necessary to characterize the contamination attributable to the Landfill, better define potential ARARs, and narrow the range of preliminarily identified remedial alternatives.

B. Project Planning [2.2]

Once Respondent has collected and analyzed existing data , the Respondent shall develop the RI/FS Work Plan for implementation of the activities outlined in Task 3, design a data collection program, and identify health and safety protocols. Respondent will confer with EPA regarding the following activities and before drafting the scoping deliverables below. These tasks are described in Section C since they result in the development of specific required deliverables.

i. Refine and Document Preliminary Remedial Action Objectives and Alternatives [2.2.3]

Once existing information pertaining to contamination from the groundwater attributable to the Landfill has been analyzed and an understanding of the potential Site risks has been determined, if necessary, Respondent shall refine the preliminary remedial action objectives that have been identified by EPA for each actually or potentially contaminated medium. The revised remedial action objectives will be documented in the RI/FS Work Plan. Respondent shall then identify a preliminary range of broadly defined potential remedial action alternatives and associated technologies. The range of potential alternatives shall encompass alternatives in which treatment significantly reduces the toxicity, mobility, or volume of the waste alternatives that involve containment with little or no treatment. The range of potential alternatives shall also include a no action alternative.

ii. Document the Need for Treatability Studies [2.2.4]

No remedial actions involving treatment have been identified by Respondent or EPA, Respondent shall conduct treatability studies if EPA determines that treatability studies are necessary and appropriate after Respondent has completed the work outlined in Task 3.. Where treatability studies are needed, initial treatability testing activities (such as research and study design) will be planned to occur concurrently with Site characterization activities (Tasks 3 and 5).

iii. Begin Preliminary Identification of Potential ARARs [2.2.5]

Respondent shall conduct a preliminary identification of, and include in the RI/FS Work Plan, potential state and federal ARARs (chemical-specific, location-specific, and action-specific) to assist in the refinement of remedial action objectives and the initial identification of remedial alternatives and ARARs associated with particular actions. ARAR identification will continue as site conditions, contaminants, and remedial action alternatives are better defined.

C. Scoping Deliverables [2.3]

At the conclusion of the project planning phase, Respondent will submit to EPA for review and approval a RI/FS Work Plan, a Sampling and Analysis Plan ("SAP"), and a

Health and Safety Plan ("HSP"). The RI/FS Work Plan and SAP must be reviewed and approved by EPA prior to the initiation of field activities.

i. RI/FS Work Plan [2.3.1]

Respondent shall prepare a RI/FS Work Plan documenting the decisions and evaluations to be completed during the scoping process. The RI/FS Work Plan should be developed in conjunction with the SAP and HSP, although each may be submitted to EPA under separate cover. The RI/FS Work Plan shall include a comprehensive description of the work to be performed, including the methodologies to be used, as well as a schedule for completion. The RI/FS Work Plan shall include:

- the rationale for performing the required activities;
- a statement of the problem(s) and potential problem(s) posed by the Site and the objectives of the RI/FS;
- a site background summary, including the geographic location of the Site, a description of the Site's physiography, hydrology, geology, demographics, ecological, cultural, and natural resource features;
- a synopsis of the Site history and a description of previous responses that have been conducted at the site by local, state, federal, or private parties;
- a summary of the existing data in terms of physical and chemical characteristics of the contaminants identified and their distribution among the environmental media at the Site; and
- preliminary identification of remedial alternatives and data needs for the evaluation of remedial alternatives.

The RI/FS Work Plan will recognize the need for the preparation of the Baseline Risk Assessment. The RI/FS Work Plan will reflect coordination with any applicable treatability study requirements (Tasks 1 and 4). It will include a process for, and manner of, identifying federal and state ARARs (chemical-specific, location-specific and action-specific).

Finally, the major part of the RI/FS Work Plan is a detailed description of the tasks to be performed, information needed for each task in support of the Baseline Risk Assessment, information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to EPA. This includes:

- the deliverables set forth in the remainder of this SOW;
- a schedule for each of the required activities which is consistent with the RI/FS guidance;
- a project management plan, including a data management plan (e.g. requirements for project management systems and software minimum data requirements, data format and backup data management); and
- monthly reports to EPA and meetings and presentations to EPA at the conclusion of each major phase of the RI/FS.

Respondent will refer to Appendix B of the RI/FS Guidance for a comprehensive description of the contents of the RI/FS Work Plan. Because of the unknown nature of the site and iterative nature of the RI/FS, additional data requirements and analyses may be identified throughout the process. Respondent will submit to EPA for review and approval a technical memorandum documenting the need for additional data and identifying the DQOs whenever such requirements are identified. In any event, Respondent is responsible for fulfilling additional data and analysis needs identified by EPA consistent with the general scope and objectives of this RI/FS.

ii. Sampling and Analysis Plan [2.3.2]

Respondent will prepare a SAP to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data meet DQOs. The SAP provides a mechanism for planning field activities and consists of a Field Sampling Plan ("FSP") and a Quality Assurance Project Plan ("QAPP"). The FSP will define in detail the sampling and data gathering methods that will be used. It will include sampling objectives, sample location and frequency, sampling equipment and procedures, and sample handling and analysis. The QAPP will describe the project objectives and organization, functional activities, and quality assurance/quality control ("QA/QC") protocols that will be used to achieve the desired DQOs. The QAPP will be prepared in accordance with: "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" (EPA/240/B-01/003, March 2001) and "EPA Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/600/R-98/018, February 1998). Respondent shall perform the QA activities necessary to monitor its subcontractor's performance of these activities if a subcontractor is used.

To address the TCE contamination specifically, water samples shall be analyzed for TCE and other volatile organic compounds ("VOCs") using EPA Method 8260 or 524.2 (for drinking water) with a minimum detection level of 1.0 micrograms per liter ("ug/L"). Other constituents as listed in Task 3 shall be analyzed as set forth in Task 3. (EPA Methods 8270, 8081, 8082.) After a representative number of samples have been taken, if the constituents associated with Methods 8270, 8081, and 8082, are not detected, or are detected at acceptable levels, they will not be included in subsequent sampling rounds.

The DQOs will, at a minimum, reflect use of analytical methods for identifying and remediating contamination. The QAPP will address sampling procedures, sample custody, analytical procedures, and data reduction, validation, reporting, and personnel qualifications. Field personnel should be available for EPA QA/QC training and orientation where applicable. Respondent will demonstrate, in advance, to EPA's satisfaction that each laboratory it uses is qualified to conduct the proposed work. This includes use of methods and analytical protocols for the chemicals of concern in the media of interest within detection and quantification limits consistent with both QA/QC procedures and the DQOs approved by EPA in the Site's QAPP. The laboratory must have and follow an approved QA program which has a documented Quality Assurance Program which complies with ANSI/ASQC E4-1994: "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology

Programs" (American National Standard, January 5, 1995), "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001), or equivalent documentation as determined by EPA.

If a laboratory not in the Contract Laboratory Program ("CLP") is selected, methods consistent with CLP methods that would be used at this site for the purposes proposed, as well as QA/QC procedures approved by EPA, must be used. EPA may require that Respondent submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on personnel qualifications, equipment, and material specifications. Respondent's contract with the laboratory shall allow EPA to audit the laboratory, including: access to laboratory, personnel, equipment, and records for sample collection, transportation, and analysis.

iii. Analytical Support and Data Validation [2.3.2.4]

Respondent will schedule, coordinate, track and provide oversight of the analyses, as well as provide validation of the analytical data produced. Activities required under this task include:

- Respondent shall collect, prepare, and ship environmental samples in accordance with the FSP. The emphasis on the samples will be those necessary to conduct Baseline Risk Assessment and any other analyses deemed necessary by EPA to complete the RI/FS;
- Respondent shall perform the quality assurance activities necessary to monitor its subcontractor's performance of these activities;
- Respondent shall perform all necessary sample management activities, including chain of custody and information management; and
- Respondent shall perform data validation of the sample results including a determination of whether the data are defensible, produced in accordance with the QAPP and FSP, and useable for their intended purposes. A report outlining the data validation, process, and conclusions of the data usability shall be provided to EPA in accordance with the schedule set forth in the Settlement Agreement. Respondent may seek a reduction in the amount of data validation after a representative number of sampling events have been conducted and EPA is satisfied with the data quality. All final sampling events which define the extent of contamination shall be 100% validated.

iv. Health and Safety Plan [2.3.3]

A Health and Safety Plan ("HSP") shall be prepared in conformance with Respondent's health and safety program and in compliance with Occupational Safety and Health Administration ("OSHA") regulations and protocols and consistent with 29 CFR § 1910.120(1)(1) and (1)(2). The HSP shall include the 11 elements described in Appendix B to the RI/FS Guidance, such as a health and safety risk analysis, a description of monitoring and personal protective equipment, medical monitoring, and Site control. EPA does not "approve" the HSP, but rather EPA reviews it to ensure that

all necessary elements are included, and that it provides for the protection of human health and the environment.

TASK 2: COMMUNITY RELATIONS

The development and implementation of community relations activities are the responsibility of EPA. Respondent may assist by providing information regarding the Site's history and participating in public meetings. The extent of the Respondent's involvement in community relations activities is left to the discretion of EPA, and Respondent's community relations responsibilities, if any, are specified in the community relations plan. All Respondent conducted community relations activities will be subject to oversight by EPA.

TASK 3: SITE CHARACTERIZATION [Chapter 3]

As part of the RI, Respondent will perform the activities described in this task, including the preparation of the Site characterization summary and the RI Report. The overall objective of the Site characterization is to describe areas of the Site that may pose a threat to human health or the environment.

Respondent will define:

- the Site's physiography, geology, and hydrology;
- the surface and subsurface pathways of migration;
- the Site sources of contamination and their nature, extent, and volume, including their physical and chemical constituents as well as their concentrations at incremental locations in the affected media; and
- the extent of migration of this contamination as well as its volume and any changes in its physical or chemical characteristics, to provide for a comprehensive understanding of the nature and extent of contamination at the Site.

Respondent shall use this information to determine and project contaminant fate and transport.

During this phase of the RI/FS, the RI/FS Work Plan, SAP, and HSP are implemented. Field data are collected and analyzed to provide the information required to accomplish the objectives of the RI/FS. Respondent will notify EPA in advance of planned dates for field activities in accordance with the schedule set forth in the Settlement Agreement. Notification of field activities may include, but is not limited to: field layout of the sampling grid, excavation, installation of wells, initiation of sampling, installation and calibration of equipment, pump tests, and initiation of analysis and other field investigation activities. Respondent will demonstrate that the laboratory and type of laboratory analyses that will be utilized during Site characterization meets the specific QA/QC requirements and the DQOs of the Site investigation as specified in the SAP. In view of the unknown Site conditions, activities are often iterative, and to satisfy the objectives of the RI/FS it may be necessary for Respondent to revise the work specified

in the initial RI/FS Work Plan. In addition to the deliverables below, Respondent will provide a monthly progress report and participate in meetings at major points in the RI/FS.

A. Field Investigation [3.2]

The field investigation includes the gathering of data to define Site physical and biological characteristics, sources of contamination, and the nature and extent of contamination attributable to groundwater from the Landfill. These activities will be performed by Respondent in accordance with the RI/FS Work Plan and SAP. This characterization is to include soil, soil gas, groundwater, surface water, air, and biota as needed to characterize Site contamination to protect human health and the environment. Activities should include, but not be limited to, the following items.

i. Implement and Document Field Support Activities [3.2.1]

Respondent will initiate field support activities following approval of the RI/FS Work Plan and SAP. Respondent will perform all activities related to mobilization/demobilization for field events. Field support activities may include obtaining access to the Site and scheduling and procuring equipment, office space, laboratory services, and/or contractors. Respondent will notify EPA in accordance with the schedule set forth in the Settlement Agreement so that EPA may adequately schedule oversight tasks. Respondent will also notify EPA in writing upon completion of field activities.

ii. Investigate and Define Site Physical and Biological Characteristics [3.2.2]

Respondent will collect data on the physical and biological characteristics of the Site and its surrounding areas, including the physiography, geology, hydrology, and specific physical characteristics identified in the RI/FS Work Plan. This information will be ascertained through a combination of physical measurements, observations, and sampling efforts. The information will be used to define potential transport pathways and human and ecological receptor populations.

Phase 1 Site Characterization Work Plan Overview:

Respondent's Phase 1 Work Plan will describe the installation of two deep borings at the Landfill, groundwater and surface water monitoring, and pre-existing data evaluation and trend analysis, as described further below. The 2 new deep borings will complement the existing deep well MW-1, and be located in a manner to allow evaluation of hydrogeology and groundwater flow beneath and from the Landfill. Information from MW-1 will be collected in conjunction with data from the new wells. Surface water samples will be collected at Winsel Creek, area springs including La Jolla Spring, and identified surface water seeps. The Respondent and EPA recognize that, after completion of the Phase 1 site characterization activities outlined below, additional work to

determine groundwater contamination originating from the Landfill may be necessary for completion of the RI report.

These activities are described further as follows:

1. Install Two Deep Borings at the Landfill

The 2 deep borings and related monitoring wells are to be drilled within or proximate to the Landfill and are to be used to both confirm historic geophysical data from the area and to collect additional data on groundwater impact and flow direction from directly below the Landfill.

One boring will be located in the center of the Landfill, near the identified natural sinkhole. The other boring will be in the northwest section of the Landfill. At each respective boring location, two 2-inch or 4-inch monitoring wells will be installed, each based upon testing procedures below. For each boring, one well will be located toward the bottom of the boring. Placement of the well screens will be determined using field observation, packer testing, and geophysical testing.

1.1 Boring Installation Procedures (2 Locations)

A nominal 10-inch boring will be air rotary drilled to the bottom of the Roubidoux formation. There will be a pause in drilling at that point to see if the boring produces water at this interval. If water is present, then a sample will be collected. At the direction of EPA, drilling also will be paused in a similar manner at one or two intervals between the base of the Roubidoux formation and the projected bottom of the borehole.

The borehole will be completed using air rotary to approximately 525 ft. elevation (transmissive zone encountered for MW-1) to below the bottom of the Gasconade formation.

A 3-arm caliper log, a downhole camera log, and fluid temperature and conductive logging will be completed in the open borehole.

A heat pulse study will be conducted in the open borehole. Packer testing will be completed on the basis of the caliper, camera, fluid temperature-conductance logs, and heat pulse studies. During packer testing water level, head, and water quality parameters will be collected. Point samples or packer samples will be collected from the borehole before the wells are finished to determine vertical distribution of head and water quality.

1.2 Well Installation and Completion

Based on the geophysical logs and packer testing, two monitoring wells (either 4-inch and/or 2- or 2.5-inch ID monitoring well(s)) will be installed in each boring. Determination of size and location will be based on considerations including the need to collect and monitor samples for laboratory analysis, the need to measure head and the

need to purge and stress the aquifer. All monitoring wells are to be installed according to MDNR technical well construction specifications. A vault and concrete pad will be constructed around each completed monitoring well. The Landfill cap and liner will be repaired to prevent any potential surface leaching at these locations. Each monitoring well will be properly developed to assure connectivity with the respective water bearing zones. Each monitoring well will be surveyed and GPS located to get an accurate top-of-casing elevation and position.

2. Groundwater Sampling

Groundwater sampling of the existing Landfill monitoring wells (including MW-1 and the Voss well) and the to-be-constructed monitoring wells will be initiated upon completion of the monitoring wells in the two new deep borings. Quarterly samples will be taken for at least 1 year. Samples will be collected using submersible pumps, and analyzed for VOCs, calcium, magnesium, sodium, potassium, chloride, sulfate, phosphate, bromide, nitrate, nitrite, ammonia, alkalinity (bicarbonate, carbonate), barium, chromium, strontium, boron, lead, fluoride, iron, lithium, manganese, nickel, silica and zinc.

3. Surface Water, Seep and Spring Sampling

3.1 Sample Winsel Creek and Observed Seeps

Respondent will sample Winsel Creek once at a total of 5 locations placed upstream and downstream of the landfill. Samples and flow rates will be collected. Samples will be analyzed for the same constituents as will be analyzed in the groundwater beneath the Landfill.

3.2 Sample Springs Between Landfill and the Meramec River.

A survey of the area will be performed, and existing data evaluated, to locate existing springs between the Landfill and the Meramec River (approximately 10-15 locations). Samples and flow rates will be collected twice. Once during the Spring (March-May) and once during the late Summer-Fall (September-November) to target higher and lower flow conditions, respectively. Flow will be measured by "bucket –and-stopwatch" method where feasible, v-notch weir (non-concrete), or flow meter.

3.3 Sample LaJolla Spring Cave Complex

Surface water samples will be collected at the LaJolla Springs Cave Complex at one upstream location and one downstream location to be determined. Samples will be taken twice, once during the Spring and once in the Fall to target higher and lower base flow conditions, respectively. LaJolla Spring samples will be analyzed for the same constituents as will be analyzed in the groundwater beneath the Landfill.

Flow rates will be measured at the time of sampling at each location, once in the Spring and once in the Fall. Flow will be measured by "bucket-and-stopwatch" method where feasible, v-notch weir (non-concrete), or flow meter.

iii. Describe the Nature and Extent of Contamination [3.2.4]

As a final step during the field investigation, Respondent will gather information to describe the nature and extent of contamination attributable to the groundwater from the Landfill. To describe the nature and extent of contamination, Respondent will utilize the information on sources of contamination and Site physical and biological characteristics to give a preliminary estimate of the contaminants that may have migrated. Respondent will then implement an iterative monitoring program, including any study program identified in the RI/FS Work Plan or SAP, such that by using analytical techniques sufficient to detect and quantify the concentration of contaminants, the migration of contaminants through the various media at the site can be determined. In addition, Respondent will gather data for calculations of contaminant fate and transport. This process is continued until the area and depth of contamination are known to the level of contamination established in the QAPP and DQOs. EPA will use the information on the nature and extent of contamination to determine the level of risk presented by the Site. Respondent will use this information to help determine aspects of the appropriate remedial action alternatives to be evaluated.

B. Data Analysis [3.4]

This task includes work efforts related to the compilation of the RI analytical data and field data. Analysis of the data collected shall focus on the development or refinement of the conceptual site model by presenting and analyzing data on:

- Landfill source characteristics;
- the nature and extent of Landfill contamination;
- the contaminated transport pathways and fate of Landfill contamination; and
- the effects of Landfill contamination on human health and the environment.

Data collection and analysis for the site characterization is complete when the DQOs that were developed in scoping (including any revisions) are met, when the need (or lack thereof) for remedial actions is documented, and when the data necessary for the development and evaluation of remedial alternatives have been obtained.

i. Evaluate Site Characteristics [3.4.1]

Respondent shall analyze and evaluate the data to describe: (1) Site physical and biological characteristics; (2) contaminant source characteristics; (3) nature and extent of contamination attributable to the Landfill ; and (4) Landfill contaminant fate and transport. Results of the Landfill physical characteristics, Landfill source characteristics, and extent of contamination analyses are used in the analysis of contaminant fate and transport.

a. **Site physical characteristics** – Respondent shall analyze and evaluate the data on Site physical characteristics to describe the environmental setting at the Landfill, including important surface features, soils, geology, hydrology, meteorology, and ecology. Respondent's analysis of Site physical characteristics will emphasize factors important in determining contaminant fate and transport for all pathways by which contaminants may migrate.

b. **Source characteristics** – Respondent shall analyze data on Site contaminant source characteristics, including the source location; the type and integrity of any existing waste containment; and the types, quantities, chemical properties, physical properties, and concentrations of contaminants found on and near the Site. Respondent shall evaluate the actual and potential magnitude of releases from each source, and the mobility and persistence of source contaminants.

c. **Nature and extent of contamination** – Respondent shall analyze data on the nature and extent of contamination at and near the Landfill in all environmental media attributable to groundwater from the Landfill. This analysis will include the horizontal and vertical extent of contamination in groundwater and surface water, air and biota, as well as spatial and temporal trends in contamination.

d. **Contaminant fate and transport** – If the Site Characterization demonstrates to EPA that the Landfill has caused or is causing groundwater contamination, Respondent shall analyze Site contaminant fate and transport of contamination attributable to groundwater from the Landfill, utilizing and combining the results of the Site physical characteristics, source characteristics, and extent of contamination analyses. The analysis will include estimates of the rate of contaminant migration in the transport pathway. If appropriate, as approved by EPA, Respondent may use analytical or numerical modeling to analyze contaminant fate and transport. Respondent shall identify any proposed models to EPA in a technical memorandum before their use.

All data and programming, including any proprietary programs, shall be made available to EPA together with a sensitivity analysis. The RI data shall be presented in a format (i.e. computer disk or equivalent) to facilitate EPA's review of the Baseline Risk Assessment. Respondent shall agree to discuss and then collect any data gaps required to complete the Baseline Risk Assessment (See "Guidance for Data Usability in Risk Assessment", OSWER Directive #9285.7.05, October 1990). The site characterization will include any information necessary for the evaluation of the need for remedial action in the Baseline Risk Assessment and for the development and evaluation of remedial alternatives. Analyses of data collected for Site characterization will meet the DQOs developed in the QA/QC plan stated in the SAP (or as revised during the RI).

ii. Baseline Risk Assessment [3.4.2]

Respondent shall prepare a conceptual exposure pathway analysis in accordance with Regional guidelines and OSWER Directives 9286.7.01B-12/89 (Risk Assessment

Guidance for Superfund, Volume I, Human Health Evaluation Manual, Part A) and 9285.7.01A (Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual).

A Baseline Risk Assessment and the necessary risk assessment documents will be prepared by Respondent. All data shall be of acceptable quantity and quality so that the Baseline Risk Assessment may be prepared in accordance with the guidance documents listed herein. The objective of the Baseline Risk Assessment is to characterize and quantify, where appropriate, the current and potential human health and environmental risks that would prevail if no further remedial action is taken. The Baseline Risk Assessment will be conducted in accordance with the guidance, procedures, assumptions, methods and formats contained in the Risk Assessment References attached as Appendix A.

The Baseline Risk Assessment will have two components: the Human Health Risk Assessment, and the Ecological Risk Assessment. The Human Health Risk Assessment will address the following:

- hazard identification;
- dose response assessment;
- exposure assessment;
- risk characterization; and
- limitations/uncertainties.

The Ecological Risk Assessment will address the following:

- definition of objectives;
- characterization of Site and potential receptors;
- selection of chemicals, species, and end points for risk evaluation;
- exposure assessment;
- toxicity assessment;
- risk characterization; and
- limitations/uncertainties.

C. Data Management Procedures [3.5]

Respondent will consistently document the quality and validity of field and laboratory data compiled during the RI.

i. Document Field Activities [3.5.1]

Respondent shall collect, prepare, and ship environmental samples in accordance with the FSP. Information gathered during Site characterization will be consistently documented and adequately recorded by Respondent in well maintained field logs and laboratory reports. The method(s) of documentation must be specified in the RI/FS Work Plan and/or the SAP. Field logs must be utilized to document observations, measurements,

and significant events that have occurred during field activities. Laboratory reports must document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

ii. Maintain Sample Management and Tracking [3.5.2, 3.5.3]

Respondent shall perform all necessary sample management activities including chain of custody, information management, and data validation. Respondent will maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only validated analytical data are reported and utilized in the evaluation of remedial alternatives. Analytical results developed under the RI/FS Work Plan will not be included in any Site characterization reports unless accompanied by, or cross-referenced to, a corresponding QA/QC report. The data validation of the sample results needs to include a determination of whether the data are defensible, produced in accordance with the QAPP and FSP, and useable for their intended purposes. In addition, Respondent will establish a data security system to safeguard chain of custody forms and other project records to prevent loss, damage, or alteration of project documentation.

D. Site Characterization Deliverables [3.7]

Respondent shall prepare the Phase 1 Preliminary Site Characterization Summary and the RI Report.

i. Preliminary Site Characterization Summary [3.7.2]

Respondent shall submit to EPA for review and approval a Phase 1 Preliminary Site Characterization Summary. The Phase 1 Preliminary Site Characterization Summary will review the investigative activities that have taken place, and describe and display Site data. A report documenting the monitoring well installation, groundwater sampling, surface water and seep sampling, and data trend analysis will be prepared for submittal to the EPA upon completion of investigation activities. This report will include a data trend analysis using existing monitoring well and residential well data (as available from existing information sources available to Respondent and as provided by EPA), along with data from the new monitoring wells.

The Phase 1 Preliminary Site Characterization Summary will include documentation of the location and characteristics of surface and subsurface features, as well as contamination at the Site, including the affected media types, location types, physical state, concentration of contaminants, and quantity. In addition, the location, dimensions, physical condition, and varying concentrations of each contaminant throughout each source, and the extent of contaminant migration through each of the affected media, will be documented. The Phase 1 Preliminary Site Characterization Summary will also identify any complete exposure pathways, all exposure input parameters, and any other key issues affecting the risk assessment. The Phase 1 Preliminary Site Characterization Summary will provide a preliminary reference for developing the Baseline Risk

Assessment and evaluating the development and screening of remedial alternatives and the refinement and identification of ARARS.

EPA will determine whether the Phase 1 Preliminary Site Characterization Summary has adequately characterized the Site. If EPA determines that additional Work is required to adequately characterize the Site, within 60 days after EPA's notice describing such additional Work, Respondent shall submit to EPA for review and approval a Draft Phase 2 Site Characterization Work Plan. Respondent shall thereafter implement the Work as required by the approved Work Plan.

ii. Remedial Investigation Report [3.7.3]

Respondent shall prepare and submit a draft RI Report to EPA for review and approval. The RI Report shall summarize results of field activities to characterize the sources of contamination attributable to the Landfill, and the fate and transport of contaminants. Respondent will refer to the RI/FS Guidance for an outline of report format and contents. Following comment by EPA, Respondent will prepare a final RI Report which satisfactorily addresses EPA comments.

The draft and final RI Report shall be submitted to EPA for review and approval. The RI Report shall include a discussion of the following topics:

- Site Background
- Investigation
  - Field Investigation and technical approach
  - Chemical analyses and analytical methods
  - Field methodologies (air, biological, surface water, sediment, soil boring, soil sampling)
  - Monitoring well installation, groundwater sampling, hydrogeological assessment, etc.)
- Site Characteristics
  - Geology
  - Hydrology
  - Meteorology
  - Demographics and land use
  - Ecological assessment
- Nature and Extent of Contamination
  - Landfill Contaminant distribution and trends
  - Contaminant sources
- Fate and Transport
  - Landfill contaminant characteristics
  - Transport processes
  - Landfill Contaminant migration trends
  - Landfill Contaminant fate
- Risk Assessments

- Summary and Conclusions

TASK 4: TREATABILITY STUDIES (Chapter 5)

Treatability testing may be performed by Respondent to assist in the detailed analysis of alternatives. In addition, if applicable, testing results and operating conditions may be used in the detailed design of the selected remedial technology. If required, the following activities will be performed by Respondent.

A. Determination of Candidate Technologies and of the Need for Testing [5.2, 5.4]

Respondent will identify in a technical memorandum, subject to EPA review and approval, candidate technologies for a treatability studies program after the Phase 1 Preliminary Site Characterization Summary. The listing of candidate technologies will cover the range of technologies required for alternatives analysis (Task 6a). The specific data requirements for the testing program will be determined and refined during Site characterization and the development and screening of remedial alternatives (Tasks 2 and 6, respectively).

B. Conduct Literature Survey and Determine the Need for Treatability Testing [5.2]

Respondent will conduct a literature survey to gather information on performance, relative costs, applicability, removal efficiencies, operation and maintenance ("O&M") requirements, and implementability of candidate technologies. If practical candidate technologies have not been sufficiently demonstrated, or cannot be adequately evaluated for this Site on the basis of available information, treatability testing will be conducted. Where it is determined by EPA that treatability testing is required, and unless Respondent can demonstrate to EPA's satisfaction that they are not needed, Respondent will submit to EPA for review and approval a Treatability Testing Work Plan, outlining the steps and data necessary to evaluate and initiate the treatability testing program.

C. Evaluate Treatability Studies [5.4]

Once a decision has been made to perform treatability studies, Respondent and EPA will decide on the type of treatability testing to use (e.g. bench versus pilot). Because of the time required to design, fabricate, and install pilot scale equipment, as well as perform testing for various operating conditions, the decision to perform pilot testing should be made as early in the process as possible to minimize potential delays of the FS. To assure that a treatability testing program is completed on time and with accurate results, Respondent will either submit a separate treatability testing work plan or an amendment to the RI/FS Work Plan for EPA review and approval.

D. Treatability Testing and Deliverables [5.5, 5.6, 5.8]

The deliverables that are required where treatability testing is conducted include a work plan, a SAP, a HSP, and an evaluation report.

i. Treatability Testing Work Plan [5.5]

Respondent will prepare a treatability testing work plan or amendment to the RI/FS Work Plan for EPA review and approval describing the site background, remedial technology(ies) to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. The DQOs for treatability testing should be documented as well. If pilot scale treatability testing is to be performed, the pilot scale work plan will describe pilot plan installation and startup, pilot plan O&M procedures, operating conditions to be tested, a sampling plan to determine pilot plan performance, and a detailed HSP. If testing is to be performed offsite, permitting requirements will be addressed.

ii. Treatability Study Sampling and Analysis Plan [5.5]

If the original QAPP or FSP is not adequate for defining the activities to be performed during the treatability test, a separate treatability study SAP or amendment to the original SAP will be prepared by Respondent for EPA review and approval. Task 1, Item C of this SOW provides additional information on requirements of a SAP.

iii. Treatability Study Health and Safety Plan [5.5]

If the original HSP is not adequate for defining the activities to be performed during the treatment tests, a separate or amended HSP will be developed by Respondent. Task 1, Item C of this SOW provides additional information on the requirements of the HSP. EPA does not "approve" the treatability study HSP.

iv. Treatability Study Evaluation Report [5.6]

Following completion of treatability testing, Respondent will analyze and interpret the testing results in a technical report to EPA. Depending on the sequences of activities, this report may be a part of the RI/FS report or a separate deliverable. The report will evaluate each technology, effectiveness, implementability, cost, and actual results as compared with predicted results. The report will also evaluate full-scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

TASK 5: DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES (Chapter 4)

If the RI Site Characterization demonstrates to EPA that the Landfill is causing groundwater contamination, Respondent will develop an appropriate range of remedial alternatives to be evaluated. This range of alternatives, including innovate treatment technologies, are to be consistent with the regulations in the NCP, the RI/FS Guidance, and other OSWER Directives, including 9355.4-03, October 18, 1989 and 9283.1-06, May 27 1992: "Considerations in Ground Water Remediation at Superfund Sites and RCRA Facilities." The range of alternatives should include, as appropriate: options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but varying in the types of treatment, the amount treated, and the manner in which long term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no action alternative. The following activities will be performed as a function of the development and screening of remedial alternatives.

A. Development and Screening of Remedial Alternatives [4.2]

Respondent will develop and evaluate a range of appropriate waste management options, that at a minimum ensure protection of human health and the environment, concurrent with the RI site characterization risk. The remedial alternatives will be developed in accordance with Section 300.430(e) of the NCP.(1990).

i. Refine and Document Remedial Action Objectives [4.2.1]

Based on the Baseline Risk Assessment, Respondent will review, and if necessary modify, the Site specific remedial action objectives, and develop/modify the preliminary remediation goals ("PRGs"). The modified PRGs will specify the contaminants and media of interest, exposure pathways and receptors, and an acceptable contaminant level or range of levels (at particular locations for each exposure route).

ii. Develop General Response Action [4.2.2]

Respondent will develop general response actions for each medium of interest, defining containment, treatment, excavation, pumping, or other actions, singly or in combination to satisfy each remedial action objective.

iii. Identify Areas or Volumes of Media [4.2.3]

Respondent will identify areas or volumes of media to which general response actions may apply, taking into account requirements for protectiveness, as identified in the remedial action objectives. The chemical and physical characterization of the Site will also be taken into account.

iv. Identify, Screen, and Document Remedial Technologies [4.2.4, 4.2.5]

Respondent will identify and evaluate technologies applicable to each general response action to eliminate those that cannot be implemented at the Site. General response actions will be refined to specify remedial technology types. Technology process options for each of the technology types will be identified either concurrent with the identification of technology types or following the screening of the considered technology types. Process options will be evaluated on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative processes for each technology type. The technology type and process options will be summarized in the FS Report. The reasons for eliminating alternatives must be specified.

v. Assemble and Document Alternatives [4.2.6]

Respondent will assemble selected representative technologies into alternatives for each affected medium. Together all of the alternatives will represent a range of treatment and containment combinations that will address the Site. A summary of the assembled alternatives and their related action-specific ARARs will be prepared by Respondent for inclusion in the FS Report. The reasons for eliminating alternatives during the preliminary screening process must be specified.

B. Refine Alternatives

Respondent will refine the remedial alternatives to identify contaminant volume addressed by the proposed process and sizing of critical unit operations as necessary. Sufficient information will be collected for an adequate comparison of alternatives. PRGs for each chemical in each medium will also be modified, as necessary, to incorporate any new risk assessment information presented in the Baseline Risk Assessment. Additionally, action-specific ARARs will be updated as the remedial alternatives are refined.

C. Conduct and Document Screening Evaluation of Each Alternative [4.3]

Respondent may perform a final screening process based on short and long term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives will be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis. As appropriate, the screening will preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives will include options that use treatment technologies and permanent solutions to the maximum extent practicable.

TASK 6: DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES (Chapter 6)

If the RI Site Characterization demonstrates to EPA that the landfill is causing contamination, the detailed analysis will be conducted by Respondent to provide EPA with the information needed to allow for the selection of a site remedy. This analysis is the final task to be performed by Respondent during the FS.

A. Detailed Analysis of Alternatives [6.2]

Respondent will conduct a detailed analysis of alternatives which will consist of an analysis of each option against a set of nine evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

i. Apply Nine Criteria and Document Analysis [6.2.1, 6.2.4]

Respondent will apply the nine evaluation criteria to the assembled remedial alternatives to ensure that: the selected remedial alternative will be protective of human health and the environment; will be in compliance with, or include a waiver of ARARs; will be cost effective; will utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable; and will address the statutory preference for treatment as a principal element. The evaluation criteria include: (1) overall protection of human health and the environment; (2) compliance with ARARs; (3) long term effectiveness and permanence; (4) reduction of toxicity, mobility, or volume; (5) short term effectiveness; (6) implementability; (7) cost; (8) state acceptance; and (9) community acceptance. (Note: Criteria 8 and 9 are considered after the RI/FS report has been released to the general public.) For each alternative Respondent should provide: (1) a description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative; and (2) a discussion of the individual criterion assessment. If Respondent do not have direct input on Criteria 8 (state acceptance) and Criteria 9 (community acceptance), these will be addressed by EPA.

ii. Compare Alternatives Against Each Other And Document the Comparison of Alternatives [6.2.5, 6.2.6]

Respondent will perform a comparative analysis among the remedial alternatives. In the comparative analysis, each alternative will be compared against the others using the evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative is reserved by EPA.

B. Detailed Analysis Deliverables [6.5]

Respondent shall submit the Institutional Controls Memorandum and the FS Report to EPA for review and approval. Once EPA's comments have been addressed by Respondent to EPA's satisfaction, the FS Report may be bound with the RI Report.

i. Institutional Controls Memorandum

Respondent shall submit a memorandum on the Institutional Controls identified as potential remedial actions. The Alternatives Analysis for Institutional Controls shall include:

- the objectives (i.e. what will be accomplished) for the Institutional Controls;
- the specific types of Institutional Controls that can be used to meet the remedial action objectives;
- when the Institutional Controls need to be implemented and/or secured and how long they must be in place; and
- who will be responsible for securing, maintaining and enforcing the Institutional Controls.

The Alternatives Analysis for Institutional Controls shall also evaluate the Institutional Controls identified against the nine evaluation criteria outlined in the NCP for CERCLA cleanups, including but not limited to costs to implement, monitor and/or enforce the Institutional Controls. The Alternatives Analysis for Institutional Controls shall be submitted as an appendix to the Draft Feasibility Study Report.

ii. Feasibility Report [6.5]

This task includes the preparation of findings once remedial alternatives have been screened and evaluated. The task includes preparation of all draft and final reports to be submitted to EPA for review and approval. This report, as ultimately adopted or amended by EPA, provides a basis for remedy selection by EPA, and documents the development and analysis of remedial alternatives. The draft and final RI/FS Report shall be submitted to EPA for review and approval. Respondent will refer to the RI/FS guidance for an outline of the report format and the required report content. The FS report shall include the following sections:

- Introduction and Site Background
- Feasibility Study Objectives
- Remedial Objectives
- General Response Actions
- Identification and Screening of Remedial Technologies
- Remedial Alternatives Description
- Detailed Analysis of Remedial Alternatives (individual and comparative) and
- Summary and Conclusion.

C. Post RI/FS Support [6.3]

This task includes efforts to support EPA's ROD. The final recommendation contained in the ROD shall represent the opinion and recommendation of EPA. Under this task, Respondent shall attend public meetings, briefings, public hearings, and technical meetings with EPA, as needed, in support of the ROD.

REFERENCES FOR CITATION

The following list, although not comprehensive, comprises many of the regulations and guidance documents that apply to the RI/FS process.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. et seq.

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. Interim Final. OSWER Directive 9355.3-01. EPA/540/G-89/004. Office of Emergency and Remedial Response. U.S. Environmental Protection Agency, Washington, D.C. October 1988.

Interim Guidance on Potentially Responsible Party Participation in Remedial Investigations and Feasibility Studies. Appendix A to OSWER Directive No. 9355.3.01. Office of Waste Programs Enforcement. U.S. Environmental Protection Agency, Washington D.C.

Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies Volume I. Office of Waste Programs Enforcement, OSWER Directive No. 9835.1(c) and .1(d). U.S. Environmental Protection Agency, Washington D.C. July 1, 1991.

A Compendium of Superfund Field Operations Methods, Two Volumes. EPA/540/P-87/001a. OSWER Directive No 9355.0.14. Office of Emergency and Remedial Response. U.S. Environmental Protection Agency, Washington D.C. August 1987.

Guidance for the Data Quality Objectives Process (QA/G4). EPA/600/R-96/055. U.S. Environmental Protection Agency, Washington D.C. August 2000.

Guidance for the Data Quality Objectives Process for Hazardous Waste Sites (QA/G-4HW). EPA/600/R-00/007. U.S. Environmental Protection Agency, Washington D.C. January 2000.

EPA Requirements for Quality Management Plans (QA/R-2). EPA/240/B-01/002. U.S. Environmental Protection Agency, Washington D.C. March 2001.

EPA Requirements for Quality Management Plans (QA/R-5). EPA/240/B-01/003. U.S. Environmental Protection Agency, Washington D.C. March 2001.

Guidance for Quality Assurance Project Plans (QA/G-5). EPA/600/R-98/018. U.S. Environmental Protection Agency, Washington D.C. February 1998.

Users Guide to the EPA Contract Laboratory. OSWER Directive No. 9240.0-01D. Sample Management Office, U.S. Environmental Protection Agency, Washington D.C. January 1991.

CERCLA Compliance with Other Laws Manual. Two Volumes. OSWER Directive No. 9234.1-01 and -02. Office of Emergency and Remedial Response. U.S. Environmental Protection Agency, Washington D.C. August 1998 (draft).

Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites OSWER Directive No. 9283.1-2. Office of Emergency and Remedial Response. U.S. Environmental Protection Agency, Washington D.C. (draft)

Draft Guidance on Preparing Superfund Decision Documents. OSWER Directive No. 9355.3-02. Office of Emergency and Remedial Response. U.S. Environmental Protection Agency, Washington D.C. March 1988.

Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual. (Part A) EPA/540/1-89/002. Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, D.C. 1989.

Ecological Assessment Guidance for Superfund - Process for Designing and Conducting Ecological Risk Assessments. EPA/540/R-97/006, OSWER-9285.7-25. Office of Emergency and Remedial Response, U.S. Environmental Protection Agency, Washington, DC. June 1997.

Guidance for Data Usability in Risk Assessment. EPA/540/G-90/008. U.S. Environmental Protection Agency, Washington D.C. October 1990.

Performance of Risk Assessments in Remedial Investigation/Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs). OSWER Directive No. 9835.15. U.S. Environmental Protection Agency, Washington D.C. August 28, 1990.

Supplemental Guidance on Performing Risk Assessments in Remedial Investigation/Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs). OSWER Directive No. 9835.15(a). U.S. Environmental Protection Agency, Washington D.C. July 2 1991.

Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions. OSWER Directive No 9355.0-30. U.S. Environmental Protection Agency, Washington D.C. April 22 1991.

Health and Safety Requirements of Employed in Field Activities. EPA Order No. 1440.2. Office of Emergency and Remedial Response. U.S. Environmental Protection Agency, Washington D.C. July 12, 1981.

OSHA Regulations in 29 CFR 1910.120. Federal Register 45654. December 19, 1986, *et seq.*

Interim Guidance on Administrative Records for Selection of CERCLA Response Actions. OSWER Directive No. 9833.3A. Office of Waste Programs Enforcement. U.S. Environmental Protection Agency, Washington D.C. March 1, 1989.

Community Relations in Superfund: A Handbook. Office of Emergency and Remedial Response, OSWER Directive No. 9230.0-03C. U.S. Environmental Protection Agency, Washington D.C. January 1992.

Community Relations During Enforcement Activities and Development of the Administrative Record. Office of Waste Programs Enforcement, OSWER Directive No. 9836.0-1A. U.S. Environmental Protection Agency, Washington D.C. November 1988.

APPENDIX A
Risk Assessment References

The Baseline Risk Assessment must be conducted in accordance with U.S. EPA guidance, procedures, assumptions, methods, and formats contained in, but not limited to the following:

McDonald DD, Ingersoll CG, Berger T. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. *Arch Environ Contam Toxicol* 39:20-31.

U.S. EPA. 1989. Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual - Part A. Office of Emergency and Remedial Response, Washington, D.C. EPA/540/1-89/002.

U.S. EPA. 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. Office of Emergency and Remedial Response, Washington, D.C. OSWER Publication #9285.6-03.

U.S. EPA. 1991. Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual - Part B. Office of Emergency and Remedial Response, Washington, D.C. EPA/540/R-92/003, Publication #9285.7-01B.

U.S. EPA. 1991. Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual - Part C. Office of Emergency and Remedial Response, Washington, D.C. EPA/540/R-92/004.

U.S. EPA. 1991. Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions. Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive #9355.0-30.

U.S. EPA. 1992. Guidance for Data Useability in Risk Assessment (Part A) Office of Emergency and Remedial Response, Washington, D.C. 9285.7-09A.

U.S. EPA. 1994. Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children. Version 0.99d. Office of Emergency and Remedial Response, Washington, D.C. OSWER Publication #9285.7-15-1.

U.S. EPA. 1994. Revised Interim Soil Lead (Pb) Guidance for CERCLA Sites and RCRA Corrective Action Facilities. Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive #9355.4-12.

U.S. EPA. 1996. Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. Office of Emergency and Remedial Response, Washington, D.C. EPA/540/R-3/001.

U.S.EPA. 1996. Soil Screening Guidance: Technical Background Document. Office of Emergency and Remedial Response, Washington, DC. EPA/540/R95/128.

U.S. EPA. 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Washington, D.C. EPA/540/R-97/006.

U.S. EPA. 1997. Exposure Factors Handbook. Office of Research and Development, Washington, D.C. EPA/600/P-95/002Fa.

U.S. EPA. 1997. Health Effects Assessment Summary Tables FY 1997 Update. Office of Solid Waste and Emergency Response, Washington, DC. EPA-540-R-97-036.

U.S. EPA. 1998. Clarification to the 1994 Revised Interim Soil Lead (Pb) Guidance for CERCLA Sites and RCRA Corrective Action Facilities. Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive #9200.4-27P.

U.S. EPA. 1999. Short Sheet: IEUBK Model Bioavailability Variable. Office of Solid Waste and Emergency Response, Washington, D.C. EPA/540/F-00/006.

U.S. EPA. 1999. Short Sheet: IEUBK Model Soil/Dust Ingestion Rates. Office of Solid Waste and Emergency Response, Washington, D.C. EPA/540/F-00.007.

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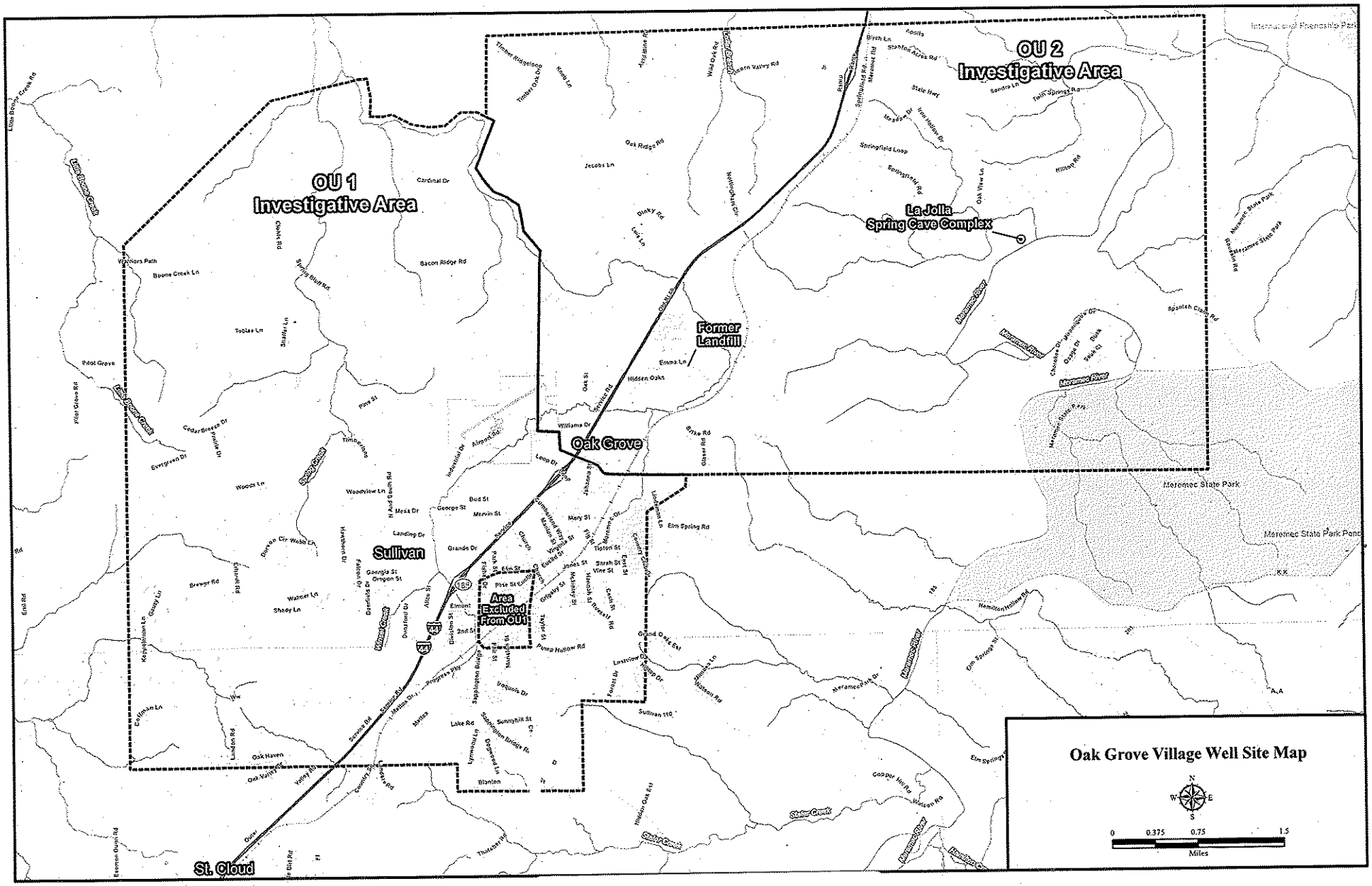

Appendix B
UAO Oak Grove Village Well
Superfund Site OU 2
City of Sullivan Landfill RI/FS

IN THE MATTER OF Oak Grove Village Well Superfund Site, Operable Unit 2, City of Sullivan Landfill RI/FS; City of Sullivan, Missouri, Respondent
Docket No. CERCLA-07-2009-0016

CERTIFICATE OF SERVICE

I certify that a true and correct copy of the foregoing Unilateral Administrative Order for Remedial Investigation/Feasibility Study was sent this day in the following manner to the addressees:

Copy hand delivered to
Attorney for Complainant:

James D. Stevens
Assistant Regional Counsel
Region VII
United States Environmental Protection Agency
901 N. 5th Street
Kansas City, Kansas 66101

Copy by FEDEX delivery to:

Baerbel Schiller
Spencer Fane Britt & Browne
1000 Walnut Street, Suite 140
Kansas City, Missouri 64106

Dated: 10/2/09

Kathy Robinson
Kathy Robinson
Hearing Clerk, Region 7