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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105-3901

Certified Mail Number: P 878 533 301
Return Receipt Requested

August 25, 1992

Thomas J. Volgy, Mayor
City of Tucson
City Hall
255 West Alameda Street
Tucson, Arizona 85701

James Mellor
Chief Operating Officer
General Dynamics Corporation
7733 Forsyth Blvd.
Clayton, Missouri 63105

John F. McDonnell
Chief Executive Officer
McDonnell Douglas Corporation
J.S. McDonnell Road and Airport Road
St. Louis, Missouri 63134

Walter A. Burg
General Manager
Tucson Airport Authority
7005 S. Plummer Ave.
Tucson, Arizona 85706

Re: Tucson International Airport Superfund Site;
Amended Unilateral Administrative Order
U.S. EPA Docket No. 92-09

Dear Gentlemen:

The Environmental Protection Agency ("EPA") has reviewed the comments raised regarding the §106 unilateral administrative order in the meeting of August 4, 1992 and the letter dated August 7, 1992 submitted on behalf of the City of Tucson ("City") and Tucson Airport Authority ("TAA").

The Director, Hazardous Waste Management Division, has reviewed such letter and comments and has decided to amend portions of the Order. EPA's response to such comments is enclosed herewith. Please note that EPA has changed the schedule

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for the respondents' deliverables to the same time frames that were agreed to by EPA during consent order negotiations. Therefore, while EPA will continue to thoroughly investigate and review any future requests by respondents for time extensions, EPA will be disinclined to grant any such request in light of the generous, extended schedule.

If you have any technical questions regarding the enclosed, please contact Craig Cooper (415) 744-2370. Please contact Danita Yocom (415) 744-1347, regarding any legal questions you may have.

Sincerely,

Keith Takata

Jeff Zelikson
for Director
Hazardous Waste Management Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 9

In the matter of: CITY OF TUCSON, TUCSON AIRPORT AUTHORITY, MCDONNELL DOUGLAS CORP. AND GENERAL DYNAMICS CORP., RESPONDENTS Proceeding Under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. §§9601 et seq.)	)	U.S. EPA Docket No. 92-09

AMENDED ADMINISTRATIVE ORDER FOR
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

I. AUTHORITY

This Amended Administrative Order ("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 ("CERCLA"), 42 U.S.C. §106(a). The President delegated this authority to the Administrator of the United States Environmental Protection Agency ("EPA" or "Agency") by Executive Order 12580, 52 Fed. Reg. 2923, who further delegated it to the Assistant Administrator for Solid Waste and Emergency Response and the Regional Administrators by EPA Delegation Nos. 14-8-A and 14-14-C. This authority has been redelegated to the Director, Hazardous Waste Management Division, EPA, Region 9 ("Director").

II. DEFINITIONS

A. "Site" means all portions of the Superfund Site that are

or were owned by, leased to or otherwise operated or controlled by the Tucson Airport Authority or its predecessors, as specified by the approximate boundaries shown in Appendix A, any areas onto or into which contaminants from such property have come to be located, and any other areas necessary for implementation of the response action, but shall specifically exclude the areas operated by the Arizona Air National Guard. The "Superfund Site" as used herein shall mean the Tucson International Airport Area Superfund Site specified in the National Priorities List Docket.

B. "Day" means calendar day unless otherwise noted in this Order. "Working Day" means calendar day except for Saturday, Sunday, and any Federal holiday.

C. "Week" means calendar week, Sunday through Saturday, unless otherwise noted in this Order.

D. "Month" means calendar month unless otherwise noted in this Order.

E. "National Contingency Plan" and "NCP" mean the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300, including any future amendments thereto.

F. "Vadose Zone" means that unsaturated volume of soil and soil gas on or below the Site which extends from the ground surface to the top of the regional aquifer.

G. "Groundwater" means any perched groundwater and any portion of the regional aquifer below the Site, specifically excluding "Covered Matters" as defined in the Consent Decree.

H. "Consent Decree" means that certain Consent Decree entered in U.S. v. Tucson Airport Authority, et al., Civ. No 90-

587 TUC RMB (D. Ariz., June 5, 1991).

III. STATEMENT OF PURPOSE AND PARTIES BOUND

A. This Order requires Respondents to perform the following tasks: (1) 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 Vadose Zone and Groundwater, by conducting a remedial investigation ("RI") as described in the RI/FS Statement of Work attached hereto as Appendix B; and (2) to determine and evaluate alternatives for remedial action to prevent, mitigate or otherwise respond to or remedy any release or threatened release of hazardous substances, pollutants, or contaminants at or from the Vadose Zone and Groundwater by conducting a feasibility study ("FS") as described in Appendix B.

B. Upon issuance of the Record of Decision in connection with the RI/FS required hereunder, EPA, in its discretion, may amend this Order to augment Section VIII (Work to be Performed) to require Respondents to develop plans and specifications for the remedial action selected by EPA in such Record of Decision which plans and specifications shall take the form of a final remedial design ("RD"). In such event, Respondents shall develop a remedial design work plan setting forth a detailed description of tasks and deliverables to complete the remedial design, and a schedule for completing such tasks and deliverables which shall attain and maintain all requirements, including performance standards, identified in the Record of Decision. EPA, in its

discretion, may issue one or more additional orders to any or all Respondents requiring performance of such RD work.

C. This Order shall apply to and be binding upon each Respondent and each of their agents, officers, directors, trustees, members, employees, successors and assigns and any entities controlled by any Respondent. No change in ownership, membership, control or corporate or legal status of any Respondent shall alter such Respondent's obligations under this Order. Respondents shall provide, or cause to be provided, a copy of this Order to all contractors, subcontractors, laboratories and consultants that are retained by Respondents to perform the work required by this Order, within five (5) days after the effective date of this Order or, with respect to any such person retained after the effective date of this Order, within five (5) days of such retention. Notwithstanding the terms of any contract or agreement, Respondents are responsible for compliance with this Order and for ensuring that their respective officers, directors, trustees, members, employees, contractors, subcontractors, representatives and agents comply with this Order.

D. No Respondent shall convey any title, easement or other interest it may have in any property comprising the Site without including in the instrument of conveyance a provision requiring the continuous implementation of the provisions of this Order. Any Respondent conveying any interest it may have in any property comprising the Site shall provide a copy of this Order to each subsequent owner of any such property or to any successor to such

Respondent before ownership rights are transferred or such succession occurs; provided, however, that tenants, lessees or licensees of any property comprising the Site may be advised of this Order by a written notice stating Respondents are required to provide any such tenant, lessee or licensee with a copy of this Order upon request. Any such Respondent shall advise EPA in advance of any anticipated transfer of interest.

E. Respondents' obligations hereunder shall be joint and several.

IV. FINDINGS OF FACT

A. The Superfund Site was proposed for the National Priorities List on December 30, 1982, pursuant to §105 of CERCLA.

B. Respondent City of Tucson owns most of the property underlying the Tucson International Airport and, prior to October 1948, operated portions of the Site. Respondent Tucson Airport Authority since 1948 has operated the Tucson International Airport, which is located on the Site. In addition, Tucson Airport Authority owns the portion of the Site not owned by the City of Tucson. Respondent McDonnell Douglas Corp. (conducting business through its predecessor Douglas Aircraft Co.) and Respondent General Dynamics Corp. (conducting business through its predecessors, Consolidated Vultee Aircraft and Consolidated Aircraft Co.) operated facilities on the Site. U.S. Air Force and National Guard Bureau operated facilities and engaged in other activities on the Site, thereby generating hazardous wastes.

C. On August 22, 1988, EPA issued a Record of Decision

("ROD") with respect to regional aquifer remediation at the Superfund Site north of Los Reales Road. On June 5, 1991, the U.S. District Court for the District of Arizona entered the Consent Decree which concerns implementation of the ROD. On December 11, 1990, EPA issued Order No. 91-5 to the City of Tucson and the Tucson Airport Authority concerning investigation and clean-up of certain concrete structures on the Site.

D. On September 26, 1991, EPA issued Special Notice letters pursuant to Section 122(e) of CERCLA to Respondent City of Tucson, Respondent Tucson Airport Authority, Respondent General Dynamics Corp., Respondent McDonnell Douglas Corp., U.S. Air Force and National Guard Bureau in order to facilitate a settlement regarding the subject RI/FS for the Site. Respondent City of Tucson, Respondent Tucson Airport Authority, U.S. Air Force, and National Guard Bureau participated in subsequent RI/FS consent order negotiations. Respondent McDonnell Douglas and Respondent General Dynamics did not participate in such negotiations. Respondent City of Tucson and Respondent Tucson Airport Authority have refused to agree to perform the RI/FS on acceptable terms. EPA then issued a unilateral administrative order to the Respondents on July 9, 1992, pursuant to Section 106(a) of CERCLA, 42 U.S.C. §106(a).

E. The order, as issued on July 9, 1992, afforded the Respondents an opportunity to meet with EPA to discuss implementation of the order and the extent to which Respondents intended to comply therewith. On August 4, 1992, Respondent City of Tucson, Respondent Tucson Airport Authority, Respondent

General Dynamics Corp., Respondent McDonnell Douglas Corp. and U.S. Air Force attended a meeting with EPA pursuant to the Respondents' opportunity to confer. No official stenographic record of such conference was made. Respondent City of Tucson and Respondent Tucson Airport Authority summarized their comments in a letter to EPA dated August 7, 1992. After considering the comments presented at the meeting and summarized in such letter, EPA determined that certain modifications to the order were appropriate to assure that the order is complete and accurate and to facilitate implementation thereof. Accordingly, EPA issued this amended Order.

F. Hazardous substances have been detected in the Vadose Zone and Groundwater at the Site. Substances detected to date include trichloroethylene, chromium, chloroform, benzene, toluene, xylene, dichloroethylene, phenol, tetrachloroethylene, methylene chloride, trichloro-fluormethane, naphthalene, ethylbenzene, dibromochloromethane, dichlorobenzene, methyphenols, dimethylphenol and 2-butane.

G. EPA has classified trichloroethylene, chloroform and tetrachloroethylene as probable human carcinogens via ingestion. Benzene and chromium VI are known human carcinogens. Phenol is a highly toxic substance known to cause severe burns upon dermal contact and long term damage to kidney functions. Other toxic effects of trichloroethylene include central nervous system depression and irritation of the mucous membranes of the nose and throat and irritation to the eyes.

H. The Groundwater underlying the Site is a potential

drinking water supply for the City of Tucson and private well owners.

I. Actual and/or potential contaminant release and migration pathways include direct inhalation and/or ingestion of contaminated soils by: (a) persons working at Tucson International Airport; and (b) persons who live near Tucson International Airport. Another actual and/or potential contaminant release includes the migration from contaminated soils to groundwater followed by ingestion of groundwater and/or inhalation of water vapor by persons who might drink or shower in water drawn from the Site. Other actual and/or potential contaminant migration pathways may include direct inhalation, ingestion, or other utilization of contaminated soils and/or contaminated surface water by fauna and flora that may live on or about the Site. Properties neighboring the Site include commercial and residential uses. Failure to implement the RI/FS and/or the EPA-selected remedial action regarding contamination of the Vadose Zone and Groundwater would allow the above-described actual and/or potential contaminant releases and migration pathways to proceed unabated which might create and/or augment an imminent and substantial endangerment to human health and the environment.

J. Groundwater samples from the regional aquifer have indicated trichloroethylene ("TCE") concentrations in excess of 300 ppb. A sample from perched groundwater at the Site has indicated levels potentially as high as 280 ppb methylene chloride and 680 ppb TCE. Soil samples have detected contaminant

concentrations, including the following: (i) phenol - 1,100 micrograms per kilogram ("UG/KG"); (ii) TCE - 721 UG/KG; and (iii) 1,2-Dichlorobenzene - 15,000 UG/KG. Soil gas samples of TCE have been detected at 43 micrograms per liter.

V. CONCLUSIONS OF LAW

A. The Site is a "facility" as defined in Section 101(9) of CERCLA, 42 U.S.C. §9601(9).

B. Respondent City of Tucson, Respondent Tucson Airport Authority, Respondent McDonnell Douglas and Respondent General Dynamics, respectively, are each a "person" as defined in Section 101(21) of CERCLA, 42 U.S.C. §9601(21).

C. Respondent City of Tucson is an owner of the Site under CERCLA §107(a)(1) and was an owner of the Site at the time of disposal under CERCLA §107(a)(2).

D. Respondent Tucson Airport Authority is an operator of the Site and an owner of a portion of the Site under CERCLA §107(a)(1) and was an operator of the Site and was an owner of a portion of the Site at the time of disposal under CERCLA §107(a)(2).

E. Respondent McDonnell Douglas was an operator of portions of the Site at the time of disposal under CERCLA §107(a)(2).

F. Respondent General Dynamics was an operator of portions of the Site at the time of disposal under CERCLA §107(a)(2).

G. The substances listed in Section IV, Paragraph E above, are present at the Site and are "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. §9601(14).

H. The presence of hazardous substances at the Site and the

past, present and potential migration of hazardous substances from the Site each constitute an actual or threatened "release" as defined in Section 101(22) of CERCLA, 42 U.S.C. §9601(22), and within the meaning of Section 106(a) of CERCLA, 42 U.S.C. §9606(a).

I. Wastes and constituents thereof present or disposed of at the Site are "hazardous substances" as defined in section 101(14) of CERCLA, 42 U.S.C. §9601(14), or constitute a pollutant or contaminant that may present an imminent and substantial danger to the public health or welfare within the meaning of §104(a)(1) of CERCLA.

VI. DETERMINATIONS

Based on the Findings of Fact and Conclusions of Law set forth above, the Director has determined that:

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

B. The actions required by this Order are necessary to ascertain the nature and extent of the endangerment posed by such release or threatened releases and to permit selection of a remedy that mitigates such endangerment, and are thus necessary to protect the public health, welfare and the environment.

C. If performed satisfactorily, the actions required by this Order would be consistent with the National Contingency Plan, 40 CFR Part 300 ("NCP").

VII. NOTICE TO THE STATE

Pursuant to Section 106(a) of CERCLA, 42 U.S.C. §9606(a), EPA has notified the State of Arizona of the issuance of this Order by providing the Arizona Department of Environmental Quality with a copy of this Order. EPA is the lead agency with respect to the cleanup of the Site.

VIII. WORK TO BE PERFORMED

A. General Provisions

1. All work performed by Respondents pursuant to this Order shall be conducted in accordance with Appendix B and in full accordance with the following: CERCLA; the NCP; EPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (EPA, October 1988) (collectively referred to herein as "RI/FS Guidance"); the standards, specifications, guidance, and schedules contained or incorporated by reference in Appendix B attached hereto; the guidance referenced in Section IX of this Order (Sampling, Access and Data/Document Availability); and any other applicable EPA guidance documents as they may be amended or modified by EPA.

2. All work performed by or on behalf of Respondents pursuant to this Order shall be performed under the direction and supervision of a registered civil engineer or registered geologist with expertise in hazardous waste site investigation. Not less than thirty (30) days prior to initiation of field work at the Site, Respondents shall notify EPA in writing of the name, title and qualifications of such engineer or geologist and of any contractors and/or subcontractors to be used in carrying out the

terms of this Order. The qualifications of the persons undertaking the work for Respondents shall be subject to EPA's review for verification. If EPA disapproves in writing of any person's technical and/or experience qualifications, Respondents shall notify EPA of the identity and qualifications of the replacement(s) within twenty-one (21) days following Respondents' receipt of EPA's written notice of disapproval. A subsequent EPA disapproval of the replacement(s) shall be deemed a failure to comply with this Order.

3. Subsequent to selection of the registered engineer, registered geologist, contractors, or subcontractors as described in Paragraph VIII.A.2. above, Respondents may propose that different individuals, contractors and/or subcontractors direct and supervise the work required by this Order. If Respondents wish to propose such a change, Respondents shall notify EPA in writing of the name, title and qualifications of the proposed individuals and the names of principal contractors and/or subcontractors proposed to be used in carrying out the work required by this Order. Any such individual, contractors and/or subcontractors shall be subject to approval by EPA. The naming of any replacement(s) by Respondents shall not relieve Respondents of any of their obligations to perform the work required by this Order. A subsequent EPA disapproval of the replacement(s) shall be deemed a failure to comply with Order.

4. All work plans, schedules, and other reports that require EPA's approval and are submitted by Respondents pursuant to this Order are incorporated into this Order and made a part

hereof upon approval by EPA. All work plans, schedules, and other reports written by EPA pursuant to this Order are incorporated into this Order and made a part hereof when such work plans, schedules, and other reports are finalized by EPA.

5. All required sampling and sample analyses shall be conducted in compliance with Section IX of this Order at a laboratory using EPA-approved methods and procedures.

B. Work and Deliverables

Based on the Findings of Fact, Conclusions of Law, and Determinations set forth above, EPA hereby orders Respondents to perform the following work under the direction of EPA's Remedial Project Manager, and to comply with all the requirements of this Order.

1. Respondents shall perform and complete the activities set forth in the Statement of Work ("SOW") (attached hereto as Appendix B). EPA shall retain sole responsibility for the Baseline Risk Assessment, which shall serve as the basis for the FS. In addition, EPA shall retain primary responsibility for the community relations portion of the RI/FS. Regular communication and open discussions between Respondents and EPA will be necessary to assure that deliverables contain sufficient detail.

2. Respondents shall submit to EPA the deliverables set forth in Appendix B attached hereto. The Schedule for Respondents' Deliverables (attached hereto as Attachment #2 to Appendix B) specifies the due dates for Respondents to submit the specific deliverables described in the SOW.

3. With the exception of the Health & Safety Plan, EPA shall review, comment upon, and approve or disapprove (as specified in Appendix B) the plans, reports, or other deliverables submitted by Respondents. EPA shall notify Respondents in writing of its approval or disapproval of such plans, reports or other deliverables. Within ten (10) working days following receipt of such disapproval (or such other time period as EPA may specify in its disapproval or comments), Respondents shall submit a revised report, document, or other deliverable that fully corrects all deficiencies and incorporates and integrates all information and comments supplied by EPA. Upon written request by Respondents, EPA, in its discretion, may extend such cure period. If the revised report, document or deliverable is again disapproved by EPA, EPA may take any actions permitted under Section XIX of this Order. If the revised document, report, or deliverable is approved or "approved with comments" by EPA, the document shall be deemed approved on the date EPA issues an approval letter or "approval with comments" letter. The date of such an approval letter or "approved with comments" letter shall be the date for calculating subsequent deliverable due dates in Appendix B. If a document, report, or deliverable is "approved with comments" by EPA, Respondents shall follow and adhere to all EPA comments and instructions provided in such "approval with comments" letter.

4. All documents, including monthly progress reports, technical reports, and other correspondence to be submitted by Respondents pursuant to this Order, shall be sent via certified

mail to the addressees set forth below or to such other addressees as EPA hereafter may designate in writing, and shall be deemed submitted on the date received. All deliverables submitted by Respondents pursuant to Appendix B attached hereto, including revised deliverables, shall be sent via overnight express courier to the following addresses or to such other addressees as EPA hereafter may designate in writing, and shall be deemed submitted on the date Respondents place such deliverables with an express courier. Respondents shall submit two (2) copies of each document to EPA.

Documents to be submitted to EPA shall be sent to:

Craig Cooper
Remedial Project Manager (H-7-2)
Hazardous Waste Management Division
U.S. EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105
Phone: (415) 744-2370
FAX: (415) 744-1917

One copy shall also be sent to each of the following:

Richard Jenkins
Arizona Department of Environmental Quality
3033 N. Central Ave.
Phoenix, Arizona 85012

Craig Kafura
Arizona Department of Environmental Quality
4040 East 29th Street
Tucson, Arizona 85711

Frank Fenzel
ICF Technology Inc.
160 Spear Street
San Francisco, CA 94105

IX. SAMPLING, ACCESS, AND DATA/DOCUMENT AVAILABILITY

A. While conducting the sample collection and analysis activities required by this Order, Respondents shall use the

quality assurance, quality control, and chain of custody procedures described in the "NEIC Policies and Procedures Manual," May 1986, EPA-330/9-78-001-R; "U.S. EPA Region 9 Guidance for Preparing Quality Assurance Project Plans for Superfund Remedial Projects," 9QA-03-00, U.S. EPA Region 9 QAMS, September 1989; and other appropriate guidance listed in Attachment #1 of Appendix B to this Order, and upon receipt by Respondents from EPA, any final amended or superseding versions of such documents. To provide quality assurance and maintain quality control, Respondents shall:

1. Use a laboratory which has a documented Quality Assurance Program that complies with EPA guidance document QAMS-005/80;

2. Ensure that EPA personnel and/or EPA authorized representatives are allowed access to the laboratory and personnel used by Respondents for all analyses;

3. Ensure that the laboratory used by Respondents for any analysis performs such analysis according to a method or methods approved by EPA in the Field Sample Plan and Quality Assurance Project Plan to be submitted by Respondents.

B. At EPA's request, Respondents shall provide to EPA and/or their authorized representatives split or duplicate samples of any samples collected by Respondents as part of the RI/FS Work Plan. Respondents shall notify EPA in the preceding monthly report of the scope and exact dates any planned sample collection activity or other on-site field activity or, if circumstances preclude notice in the preceding monthly report, no

later than seven (7) working days prior to the planned sampling or field event.

C. Nothing in this Order shall be interpreted as limiting EPA's inspection or information gathering authority.

D. For purposes of this Order, EPA's authorized representatives shall include, but not be limited to, the Arizona Department of Environmental Quality and consultants and contractors hired by EPA to oversee activities required by this Order.

X. OTHER APPLICABLE LAWS

A. Respondents shall undertake all actions required by this Order in accordance with the requirements of all applicable local, state and federal laws and regulations unless an exemption from such requirements is specifically provided under CERCLA or unless Respondents obtain a variance or exemption from the appropriate governmental authority. Respondents' compliance with local and state laws and regulations is subject to Section 121(e) of CERCLA, 42 U.S.C. § 9621(e).

B. Any materials removed from the Site shall be disposed of or treated at a facility that complies with the requirements of Section 121(d)(3) of CERCLA, 42 U.S.C. §9621(d)(3).

XI. RECORD PRESERVATION

Respondents shall maintain, during the pendency of this Order and for a minimum of ten (10) years after EPA provides notice to Respondents that the work has been completed, a central depository of the records and documents required to be prepared under the Work Plan. In addition, Respondents shall retain originals or copies of all data or documents that relate to or

contain information concerning the use, disposal, migration, treatment, removal, transportation or presence of hazardous substances or constituents thereof at or from the Site and that are in their possession or in the possession of their officers, directors, trustees, employees, agents, contractors subcontractors or attorneys. After this ten (10) year period, Respondents shall notify EPA at least thirty (30) days before any such documents are scheduled to be destroyed. If EPA so requests, Respondents shall provide these documents to EPA. Any Respondent may assert a confidentiality claim regarding such materials (excepting analytical data) pursuant to 40 C.F.R. §2.203(b). Documents for which no confidentiality claim is made may be made available to the public without notice to Respondents.

XII. DESIGNATED PROJECT MANAGERS

A. EPA designates Craig Cooper, an employee of EPA Region IX, as its Remedial Project Manager ("EPA RPM") who shall have the authorities, duties, and responsibilities vested in the Remedial Project Manager by the NCP. Within fifteen (15) days of the effective date of this Order, Respondents shall designate a Project Coordinator who shall be responsible for overseeing Respondents' implementation of this Order. The EPA RPM will be EPA's designated representative. To the maximum extent possible, all oral communications between Respondents and EPA concerning the activities performed pursuant to this Order shall be directed through the EPA RPM and Respondents' Project Coordinator. All documents, including progress and technical reports, approvals,

and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be delivered in accordance with Paragraph VIII.B.4.

B. EPA may change its EPA RPM and Respondents may change their Project Coordinator. Such a change shall be accomplished by notifying the other party in writing at least one week prior to the change except in the case of an emergency, in which case notification shall be made orally followed by written notification as soon as possible.

C. Consistent with the provisions of this Order, the EPA RPM shall also have the authority vested in the On-Scene Coordinator ("OSC") by the NCP, unless EPA designates a separate individual as OSC, who shall then have such authority. Such authorization includes, but is not limited to, the authority to halt, modify, conduct or direct any tasks required by this Order and/or undertake any response actions (or portions of the response action) when conditions present or may present a threat to public health or welfare or the environment as set forth in the NCP.

D. The absence of the EPA RPM or OSC from the Site shall not be cause for the stoppage of work. Nothing in this Order shall limit the authority of the OSC or the EPA RPM under law.

XIII. MODIFICATION OF WORK REQUIRED

A. In the event of significant unanticipated or changed circumstances at the Site, Respondents shall notify the EPA RPM, or, if the EPA RPM is unavailable, the EPA OSC by telephone within twenty-four (24) hours of discovery of the new or changed

circumstances. This verbal notification shall be followed by written notification postmarked within five (5) days of such discovery.

B. The Director may determine that tasks in addition to those addressed herein may be required. Where consistent with Section 106(a) of CERCLA, the Director may direct as an amendment to this Order or a separate order that Respondents perform these response actions in addition to those required herein by any plan or deliverable. Respondents shall implement the additional tasks the Director identifies. The additional work shall be completed according to the standards, specifications, and schedules identified by the Director.

XIV. SITE ACCESS

A. Respondents shall permit EPA and its authorized representatives to have access at all reasonable times to the Site to monitor any activity conducted pursuant to the Work Plan and to conduct such tests or investigations as EPA deems necessary. Nothing in this Order shall be deemed a limit on EPA's authority under law to gain access to the Site.

B. To the extent Respondents require, or EPA notifies Respondents that it requires, in connection with this Order, access to land other than land Respondents own, Respondents shall use their best efforts to obtain, within forty-five (45) days of the effective date of this Order, access for EPA, its contractors and oversight officials; state oversight officials and state contractors; and Respondents or their authorized representatives. If Respondents fail to gain access within forty-five (45) days,

Respondents shall notify EPA of such failure and the reasons therefor, and shall continue to use their best efforts to obtain access until access is granted. For purposes of this paragraph, "best efforts" includes but is not limited to seeking judicial assistance and the payment of money as consideration for access. Nothing in this Order shall be deemed a limit on EPA's authority under law to gain access to any such land.

XV. DELAY IN PERFORMANCE

A. Any delay in performance of this Order that, in the EPA's judgment, is not properly justified by Respondents under the terms of this Section shall be considered a violation of this Order. Any delay in performance of this Order shall not affect Respondents' obligations to fully perform all obligations under the terms and conditions of this Order.

B. Respondents shall notify EPA of any delay or anticipated delay in performing any requirement of this Order. Such notification shall be made by telephone to EPA's RPM within forty-eight (48) hours after any Respondent first knows or should know that a delay might occur. Respondents shall adopt all reasonable measures to avoid or minimize any such delay. Within five (5) working days after notifying EPA by telephone, Respondents shall provide written notification fully describing the nature of the delay, any justification for it, any reason why Respondents should not be held strictly accountable for failing to comply with any relevant requirements of this Order, the measures planned and taken to minimize the delay, and a schedule for implementing the measures that will be taken to mitigate the

effect of the delay. Increased costs or expenses associated with implementation of the activities called for in this Order are not justifications for any delay in performance.

C. If Respondents are unable to perform any activity or submit any document within the time required under this Order, Respondents may, prior to the expiration of the time, request an extension of time in writing. The extension request shall include a justification for the delay. Submission of an extension request shall not affect Respondents' obligation to comply with the requirements of this Order.

D. If EPA determines that good cause exists for an extension of time, it may grant a request made pursuant to Subparagraph C, above, and specify in writing a new schedule for completion of the activity and/or submission of the document.

E. Appendix B attached hereto specifies due dates for Respondents' to submit the specific deliverables described therein. Respondents may accrue a number of working days equal to the aggregate number of working days any original deliverables are submitted prior to the due dates specified in Appendix B. Respondents may use all or any part of such accrued working days to extend the due date(s) of any subsequent original deliverables, provided, that the number of working days by which any due date is extended shall not exceed the number of working days accrued as of the date such extension is exercised. Accrued working days shall not be used to extend the period for Respondents to revise or modify deliverables. EPA shall be responsible for tracking and keeping records of the number of

accrued working days and shall inform Respondents of this amount on a periodic basis and upon Respondents request.

XVI. ENDANGERMENT AND EMERGENCY RESPONSE

A. 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, Respondents shall immediately take all appropriate action to prevent, abate, or minimize the threat, and shall immediately notify EPA's RPM, or, if the RPM is unavailable, EPA's OSC. If neither of these persons is available, Respondents shall notify the EPA Emergency Response Unit, Region IX, Phone Number (415) 744-2000. Respondents 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 and the Contingency Plan.

B. 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. ASSURANCE OF ABILITY TO COMPLETE WORK

A. Respondents shall demonstrate their ability to complete the work required by this Order and to pay all claims that arise from the performance of the work by obtaining and presenting to EPA for approval, within thirty (30) days after the effective

date of this Order, one or more of the following: (1) a performance bond; (2) a letter of credit; (3) a guarantee by a financially sound third party; (4) funding of an escrow account or trust account; or (5) audited financial information sufficient to allow EPA to determine that Respondents have sufficient net worth available to perform the work. Respondents shall demonstrate financial assurance in an amount not less than the Respondents' estimate of the total cost for the RI/FS. If Respondents seek to demonstrate ability to complete the RI/FS by means of financial information, or by guarantee of a third party, they shall re-submit such information annually on the anniversary of the effective date of this Order. If Respondents seek to demonstrate ability to complete the RI/FS by means of a performance bond or letter of credit, such performance bond or letter of credit shall remain in effect until this Order is terminated. If EPA determines that the financial assurance Respondents have proposed is inadequate, Respondents shall, within fifteen (15) days after receipt of EPA's notice to this effect, obtain and present to EPA for approval one of the other forms of financial assurance listed above.

B. At least seven (7) days prior to commencing any work at the Site pursuant to this Order, Respondents shall submit to EPA a certification that Respondents or their contractors and sub-contractors have adequate, as determined by EPA, insurance coverage or have indemnification for liabilities for injuries or damages to persons or property which may result from the activities to be conducted by or on behalf of Respondents

pursuant to this Order. Respondents shall ensure that such insurance or indemnification is maintained for the duration of performance of the work required by this Order.

XVIII. DISCLAIMER

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 Respondents, or their directors, officers, members, trustees, employees, representatives, agents, successors, assigns, contractors, subcontractors or consultants in carrying out any action or activity pursuant to this Order. Neither EPA nor the United States shall be held liable as a party to any contract entered into by Respondents, or their directors, officers, members, trustees, employees, representatives, agents, successors, assigns, contractors, subcontractors or consultants in carrying out any action or activity pursuant to this Order.

XIX. ENFORCEMENT AND RESERVATIONS

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

B. Notwithstanding any other provision of this Order, at any time during the response action, EPA may stop Respondents from proceeding (either temporarily or permanently), perform its own studies, complete the RI/FS or any portion thereof and/or engage in any other response action (or any portion thereof) at or related to the Site and seek reimbursement from Respondents for costs incurred by EPA. In the event that EPA performs studies or other tasks, but elects not to undertake the RI/FS report, Respondents shall incorporate and integrate the information furnished by EPA in the RI/FS report.

C. Nothing in this Order shall preclude EPA from taking any additional enforcement action, including modification of this Order, issuance of additional Orders, seeking injunctive or other relief in court and/or employing off-set or similar rights, or from requiring Respondents in the future to perform additional activities pursuant to CERCLA, 42 U.S.C. §9607(a), et seq., or any other applicable law. Respondents shall be liable under CERCLA Section 107(a), 42 U.S.C. §9607(a), for the costs of any such additional actions.

D. Notwithstanding any provision of this Order, the United States hereby retains all of its information-gathering, inspection and enforcement authorities and rights under CERCLA, the Resource Conservation and Recovery Act and any other statutes or regulations or judicial decisions.

E. Respondents shall be subject to civil penalties, under Section 106(b) of CERCLA, 42 U.S.C. §9606(b), of not more than $25,000 for each day in which Respondents violate or fail to

comply with the requirements of this Order. In addition, failure to take response action in compliance with this Order, or any portion hereof, without sufficient cause, may result in liability under Section 107(c)(3) of CERCLA, 42 U.S.C. §9607(c)(3), for punitive damages in an amount at least equal to, and not more than three (3) times the amount of any costs incurred by the Hazardous Substance Superfund, as a result of such failure to comply.

F. Notwithstanding compliance with the terms of this Order, including the completion of an EPA-approved RI/FS report, Respondents are not released from liability, if any, for any enforcement actions beyond the terms of this Order taken by EPA respecting the Site.

G. EPA reserves the right to take any enforcement action pursuant to CERCLA and/or any other legal authority, including the right to seek injunctive relief, monetary penalties, reimbursement of response costs, and punitive damages for any violation of law or this Order.

H. EPA expressly reserves all rights and defenses that it may have, including the EPA's right both to disapprove work performed by Respondents and to request that Respondents perform tasks in addition to those detailed in Appendix B, as provided in Section VIII (Work to be Performed) of this Order. EPA reserves the right to undertake removal actions and/or remedial actions at any time. EPA reserves the right to seek reimbursement from Respondents for the costs incurred by the United States in removal and remedial actions.

I. This Order does not release any Respondent from any claim, cause of action or demand in law or equity, including, but not limited to, any claim, cause of action, or demand which lawfully may be asserted by representatives of the United States or the State of Arizona.

J. No informal advice, guidance, suggestions or comments by EPA regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall be construed as relieving Respondents of their obligation to obtain such formal approval as may be required by this Order.

XX. NOTICE OF INTENT TO COMPLY

Each Respondent shall, within seven (7) days of receipt of this Order, provide written notice to EPA stating whether it will comply with the terms of this Order. Failure to respond, or failure to agree to comply with this Order, shall be deemed a refusal to comply with this Order.

XXI. OPPORTUNITY TO CONFER

A. Respondents have heretofore exercised their opportunity to jointly confer with EPA's Director of the Hazardous Waste Management Division and/or his designee(s) to discuss this Order and have submitted comments in writing in connection therewith.

XXII. SEVERABILITY

If any provision or authority of this Order or the application of this Order to any circumstance is held by a court to be invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby, and the remainder of this Order shall remain in force.

XXIII. STATE AND LOCAL AGENCY PARTICIPATION

Respondents shall make available, upon request of EPA's Remedial Project Manager, copies of any deliverable required by this Order to the State of Arizona for review. EPA will provide Respondents with a current mailing list of state agencies prior to the effective date of this Order. After the agencies have had the opportunity to review the deliverables, EPA may meet with the agencies to discuss the deliverables and prepare collaborative comments. Any collaborative comments and/or comments prepared by or on behalf of EPA shall be submitted to Respondents as EPA's comments. Respondents shall respond to all of these comments as may be required by the terms of Section VIII (Work to be Performed).

XXIV. ACCESS TO ADMINISTRATIVE RECORD

The Administrative Record supporting this Order is available for review on Working Days between the hours of 9:00 a.m. and 5:00 p.m. in the Office of Regional Counsel, United States Environmental Protection Agency, Region IX, 75 Hawthorne Street, 16th Floor, San Francisco, California. Please contact Danita Yocom, Assistant Regional Counsel, at (415) 744-1347 to review the Administrative Record.

XXV. EFFECTIVE DATE

This Order is effective as of the date hereof.

XXVI. TERMINATION AND SATISFACTION

The provisions of this Order shall be deemed satisfied upon Respondents' receipt of written notice from EPA that Respondents have demonstrated, to the satisfaction of EPA, that all of the

terms of this Order, including any additional tasks which EPA has determined to be necessary, have been completed.

IT IS SO ORDERED:

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

By: Keith Takata for Jeffrey Zelikson
Director
Hazardous Waste Management Division
Region 9

Date: August 25, 1992

EPA Region 9 Contacts:

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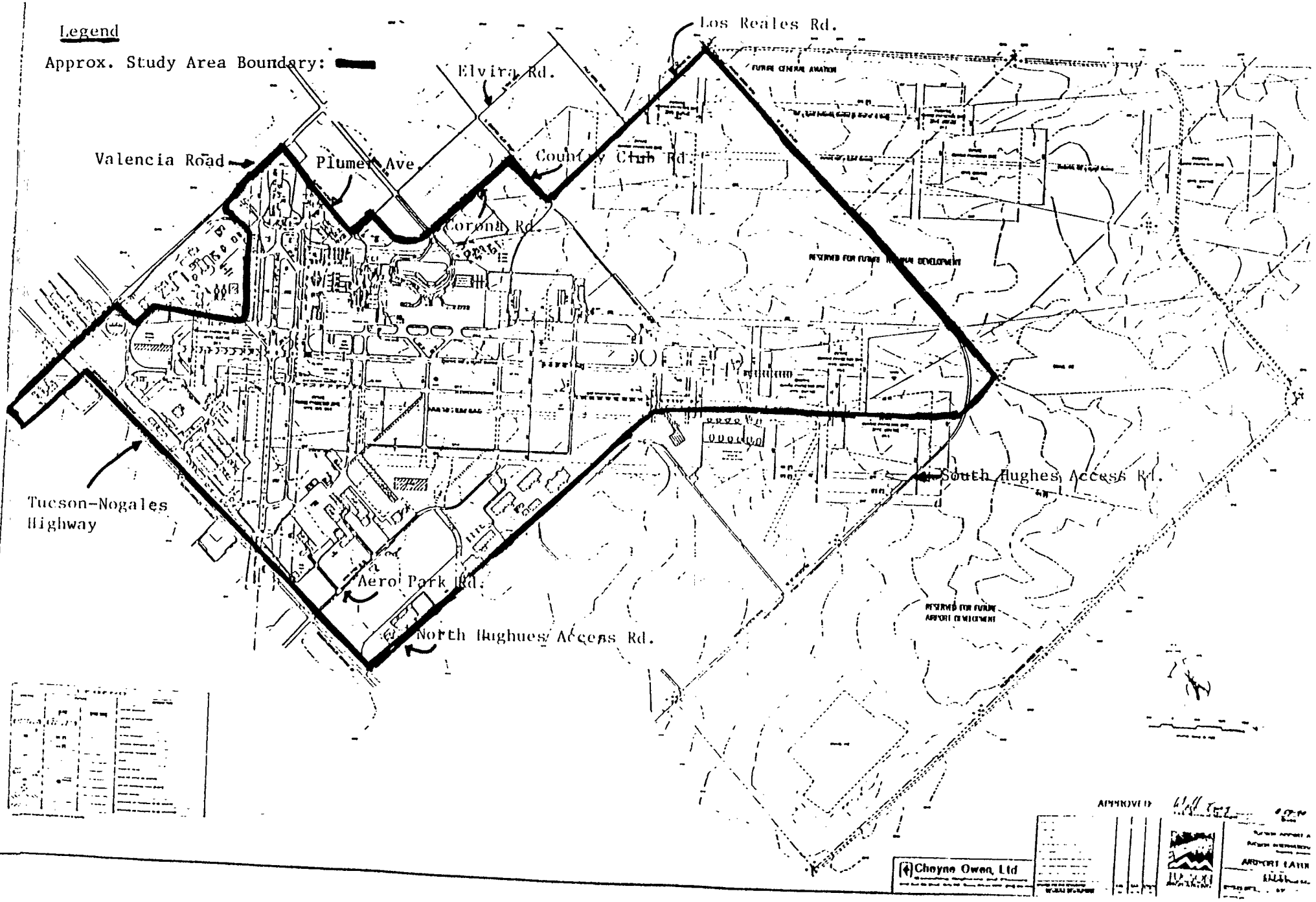
APPENDIX A
TUCSON AIRPORT RI/FS AMENDED ADMINISTRATIVE ORDER
EPA REGION IX DOCKET NO. 92-09



APPENDIX B
Tucson Airport RI/FS Amended Administrative Order
EPA Region IX Docket No. 92-09

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TUCSON AIRPORT RI/FS AMENDED ADMINISTRATIVE ORDER, APPENDIX B
EPA REGION IX DOCKET NO. 92-09
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
STATEMENT OF WORK

INTRODUCTION

The purpose of this Remedial Investigation/Feasibility Study (RI/FS) is to investigate the nature and extent of vadose zone and groundwater contamination at the Site ("Site" is defined in the Amended Administrative Order), assess the potential risk to human health and the environment, conduct treatability studies (if needed), and develop and evaluate potential remedial action alternatives. This RI/FS shall focus on all existing and potential sources of hazardous substance contamination of the vadose zone and the groundwater located within the Site. For the purposes of this Amended Administrative Order (hereafter referred to as "Administrative Order" or "Order"), the vadose zone shall be all soil and soil gases extending from the ground surface to the top of the regional aquifer excluding any perched groundwater. Groundwater shall be any perched groundwater and the regional aquifer. In order to avoid duplication of work with respect to regional aquifer contamination, only regional aquifer contamination not addressed by the Tucson International Airport Superfund Site groundwater Record of Decision issued by EPA on August 22, 1988 shall be investigated pursuant to this RI/FS.

The RI and FS are interdependent and may be conducted concurrently so that the data collected in the RI influences the development of remedial alternatives in the FS, which in turn may dictate additional data needs and the scope of treatability studies.

The Respondents shall conduct this RI/FS, except for community relations and the baseline risk assessment, and shall produce RI and FS reports that are in accordance with this Statement of Work, Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (October 1988, OSWER Directive 9355.3-01)(also known as the RI/FS Guidance), and any other applicable guidances that EPA has issued for conducting a RI/FS (a list of the primary guidances is attached), as well as any additional requirements in the Administrative Order. The RI/FS Guidance describes the report format and the required report content. The Respondents shall furnish all necessary personnel, materials, and services needed, or incidental to, performing the RI/FS, except as otherwise specified in the Administrative Order.

At the completion of the RI/FS, EPA shall be responsible for the selection of a Site remedy, preparation of the proposed remediation plan, and shall document the selected remedy in a Record of Decision (ROD) in accordance with the Comprehensive Environmental and Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP). EPA shall also

be responsible for the release to the public of the final RI/FS report. The final RI/FS report, as adopted by EPA, and EPA's baseline risk assessment, shall, with the administrative record, form the basis for the selection of the Site's remedy and shall provide the information necessary to support the development of the ROD.

The remedial action alternatives selected by EPA shall meet the cleanup standards specified in CERCLA Section 121. That is, the selected remedial action shall be protective of human health and the environment, shall be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements of other laws, shall be cost-effective, shall utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and shall address the statutory preference for treatment as a principal element.

As specified in CERCLA Section 104(a)(1), as amended by SARA, EPA shall provide oversight of the Respondents' activities throughout the RI/FS. The Respondents shall cooperate with EPA's implementation of oversight activities, data validation, community relations, risk assessment, and other activities as specified by EPA.

DESCRIPTION AND IMPLEMENTATION OF RI/FS TASKS

This RI/FS Statement of Work (SOW) consists of seven overall tasks. EPA shall retain primary responsibility for Tasks two and four listed below. The Respondents shall be responsible for, with EPA oversight, Tasks one, three, and five through seven.

TASK	LEAD PARTY
1. Scoping	1. Respondents
2. Community Relations	2. EPA
3. Site Characterization	3. Respondents
4. Baseline Risk Assessment	4. EPA
5. Treatability Studies	5. Respondents
6. Development and Screening of Remedial Alternatives	6. Respondents
7. Detailed Analysis of Remedial Alternatives	7. Respondents

The rest of this SOW provides a detailed description of the tasks and activities the Respondents shall implement. Brief descriptions of EPA tasks are also provided. Respondents shall implement all tasks and activities provided below for Tasks 1,3,5,6, and 7. Tasks/activities with a bolded asterisk (*) before the title indicate specific deliverables to be provided by

the Respondents to EPA in accordance with the schedule attached (Attachment #2) to this SOW. Numbers provided after each task/activity title (e.g. 4.3) indicate the chapter and section of the RI/FS Guidance that provide additional information in order to successfully fulfill that task/activity.

I. TASK 1: SCOPING (RI/FS Guidance, Chapter 2)

A. INTRODUCTION

The preliminary Site specific objectives of the RI/FS, including the preliminary remediation goals (PRGs), have been determined by EPA and are identified below in this SOW. The Respondents shall document the specific project scope in the RI/FS Work Plan. Because the work required to perform a RI/FS is not fully known at the onset, and is phased in accordance with a site's complexity and the amount of available information, it may be necessary to modify the RI/FS Work Plan, pursuant to Section XIII (Modification of the Work Required) of the Administrative Order, during the RI/FS to satisfy the objectives of the study.

The following SOW task (Task 1) addresses activities required for scoping exercises attendant to a RI/FS for the Site. Other activities of the RI/FS, to be implemented following completion of scoping, are addressed in SOW tasks 2 through 7. The purpose of conducting a remedial investigation/ feasibility study (RI/FS) under the Superfund program is to develop the data necessary to evaluate a site and support required risk-management decisions. The primary decisions that must be rendered under Superfund are:

(1) a determination as to whether hazardous substances present at a site potentially pose a significant risk to surrounding populations or the environment; and

(2) should a potentially significant risk be found, a determination of which are the best of the appropriate remedial alternatives which should be applied to the site to reduce risks to acceptable levels.

Superfund program objectives, defining considerations that must be addressed when rendering the above decisions and the types of information that must be developed for supporting such decisions, may be found in the defining regulations for: the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Re-authorization Act (SARA), known as "Superfund". Such objectives are further specified in the National Contingency Plan (NCP), as revised. Numerous guidances detailing appropriate procedures for

all phases of a Superfund site investigation (including a RI/FS) and evaluation are also available.

The first of the two primary types of decisions addressed at a Superfund site (listed above) generally requires that all hazardous substances present at a site be identified, that the magnitude and distribution of their concentrations be characterized, and that site conditions be characterized sufficiently to evaluate the potential for the release and transport of each hazardous substance to estimate the potential risks it poses.

The second of the above listed decisions generally requires that site conditions be characterized sufficiently to allow identification of potentially applicable remedial alternatives and to design and engineer such alternatives sufficiently to provide a cost estimate and an evaluation of effectiveness toward mitigating potential risks.

To the extent that such information has not been developed in prior studies, data required to complete mandated site characterization and evaluation must be generated in a RI/FS. Precise data objectives for a RI/FS are generally specified as part of a scoping exercise. Both the types of required data and the required quality of the data must be specified.

Under Superfund, precise data objectives for a RI/FS are developed in a scoping exercise through which otherwise general Superfund program objectives are reduced to precise, site-specific objectives by evaluating existing site information to develop a conceptual model of the site, specify a site evaluation strategy, and identify specific field measurements required to complete the site evaluation as defined in the strategy. The more precisely defined the site-specific objectives for an investigation, the easier it is to develop an efficient RI/FS.

An overview of Superfund program objectives and a preliminary set of site-specific objectives is provided in section B of this task as a starting point for the scoping of a RI/FS for the Site. It is expected that Site-specific objectives will be revised as the evaluation of Site data progresses and knowledge of the Site is refined.

Section C of this task provides a summary of required scoping activities. Scoping activities are extremely important: the more carefully Superfund program objectives can be applied to a site (to define site-specific objectives), the greater the cost-effectiveness of the resulting RI/FS.

B. OVERVIEW OF GOALS AND OBJECTIVES

Data must generally be collected during a RI/FS to support four categories of objectives:

(1) general site characterization;
(2) human health and environmental risk assessment;
(3) the design, the engineering, and the evaluation of the efficacy of remedial alternatives; and
(4) assessment of natural resource damage.

The first of the above categories of objectives simply indicates the need to provide an adequate understanding of the site as a whole to allow comprehensive evaluation of the remaining three categories of site objectives.

Regarding the second of the above, it is a statutory requirement that risk-management decisions under Superfund be based on risk assessment. Consequently, a risk assessment must be completed to support required site decisions. The risk assessment shall provide the basis for determining: 1) whether or not remedial action is necessary; 2) justification for performing remedial actions; and, 3) the detailed analysis of remedial action alternatives. Correspondingly, one of the primary objectives of a RI/FS is to provide the data required to support a risk assessment at a site[1]. Although site-specific objectives for the Site risk assessment cannot be defined until a conceptual model is developed for the Site (following a review and evaluation of existing Site data), a preliminary set of general objectives for the risk assessment is provided below (Section B.1). These will be refined as the review of existing data progresses.

The third of the above categories of objectives for a RI/FS is to provide the data necessary to evaluate, select, and engineer a remedial alternative for Site cleanup. Consequently, Superfund mandated remediation goals should also be considered when scoping a RI/FS. Although existing data has not been evaluated sufficiently to define a final set of Site-specific remediation goals for the Site, a set of preliminary remediation goals (PRGs) is provided below for consideration during the scoping of the RI/FS (Section B.2). PRGs will also be refined as the Site investigation progresses.

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1 Although the risk assessment for the Site is to be completed by EPA and its contractors, the data developed during the RI/FS for the Site must be sufficient to support the required risk assessment.

In some cases, proper design and/or engineering of a particular remedial alternative may require that various types of treatability studies be conducted to determine the behavior of contaminated matrices at a site that may have to be remediated. However, it is not possible to identify needed treatability studies until a preliminary list of potentially applicable remedial alternatives has been identified. Therefore a preliminary list of alternatives will be developed early in the scoping process for potential source areas where adequate data exists.

Regarding the last of the above categories of objectives, it is necessary to receive documentation from the Natural Resource Trustees regarding existing or threatened damage to natural resources in the vicinity of the Site. Respondents must thereafter provide data to allow for an adequate assessment of any such damage by a Natural Resource Trustee. Specific requirements for this data will be provided as the Site investigation progresses, and if necessary, a separate work plan may be developed for obtaining such data.

1. Preliminary Objectives for the Site Risk Assessment

Completing a proper site risk assessment generally requires that all exposure pathways (and their corresponding components) in or from groundwater, soil and/or soil gases potentially active at the Site be identified and characterized. Then, for each hazardous substance found at the site, the level of exposure potentially generated via each of the exposure pathways identified at the site must be measured or estimated. In the last step of the risk assessment, measured or estimated exposures are compared with appropriate dose/response factors to indicate the level of risk. Exposures are also compared to applicable or relevant and appropriate regulations (ARARs) and to-be-considereds (TBCs) for each major contaminant found at the site.

Exposure pathways each consist of:

- a source;
- a mechanism of release;
- a mechanism and medium of transport;
- a point of exposure;
- a potential receptor associated with the point of exposure; and
- a route of exposure.

Both the types of data and the quality of the data required to support a risk assessment (which must be generated as part of a RI/FS) must be defined based on site characteristics and conditions. Site-specific investigation objectives required to support risk assessment may be refined as the understanding of the site improves, particularly to identify the quality of data needed to support the risk assessment.

As a starting point, it is assumed that analytical data satisfying the requirements of EPA Analytical Level III or higher will be of sufficient quality for inclusion in the Risk Assessment (EPA, 1987). However, considerations regarding sample design, sample collection, and sample handling must be addressed in addition to sample analysis, so that all data quality objectives can be completely met.

2. Preliminary Remediation Goals (PRGs) for the Site

In general, remediation goals will be established at the Site that are protective of human health and the environment. At this time, the following PRGs have been established for an EPA-selected remedy:

1. use treatment to address the principal threats wherever practicable, minimize untreated waste, and best meet the nine criteria for evaluation described in the NCP;

2. implement an innovative, but technically proven, technology wherever practical and cost effective;

3. comply with promulgated Federal and State cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations that are Applicable or Relevant and Appropriate (ARAR). To-be-considered (TBCs) advisories, criteria, or guidelines will be evaluated along with ARARs to determine if they are relevant and appropriate levels of cleanup when no ARAR adequately address a particular situation, or when existing ARARs do not ensure adequate protectiveness;

4. protect human health and the environment and achieve all remedial action objectives;

5. for systemic toxicants, acceptable exposure levels shall represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime, or part of a lifetime, incorporating an adequate margin of safety; and

6. for known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of 10^{-4} to 10^{-6} (i.e. a one-in-ten-thousand to a one-in-a-million risk) using information on the relationship between the dose and response. The 10^{-6} risk level shall be used as the point of departure for determining remediation goals for alternatives when ARARs are not available or are not sufficiently protective because of the presence of multiple contaminants or multiple pathways of exposure.

3. Preliminary Site-Specific Objectives for the Site RI/FS

Based on the above defined objectives in (B.1) and (B.2) and a limited review of existing information, a preliminary list of Site-specific objectives for the Site RI/FS has been defined. This list identifies the objectives the Respondents shall satisfy via Administrative Order deliverables and other activities in order to successfully complete the RI/FS. The following list will be revised by EPA and Respondents (with EPA approval) as knowledge of the Site progresses:

1. determine the nature and extent of hazardous substance contamination in the vadose zone within the Site (i.e. conduct a Vadose Zone Remedial Investigation);

2. determine the nature and extent of hazardous substance contamination in the groundwater within the Site (i.e. conduct a Groundwater Remedial Investigation);

3. quantify relevant characteristics of source matrices and potential transport media at the Site (including, for example, surface topography, soil properties, geology, hydrogeology, meteorology, and ecology) to allow for the determination of release and transport rates;

4. determine the need for treatability testing and perform treatability testing (if deemed necessary by EPA) to assist in the detailed analysis of remedial action alternatives;

5. carry out the identification, development and screening of vadose zone remedial action alternatives to develop an appropriate range of vadose zone waste management options to be evaluated in detail. Carry out a detailed analysis of vadose zone remedial action alternatives (i.e. a Vadose Zone Feasibility Study);

6. carry out the identification, development and screening of groundwater remedial action alternatives to develop an appropriate range of groundwater waste management options to be evaluated in detail. Carry out a detailed analysis of groundwater remedial action alternatives (i.e. a Groundwater Feasibility Study);

7. provide all required data and data interpretation needed to enable EPA to select the preferred alternatives for vadose zone and groundwater remedial actions and to issue a Record of Decision (ROD) documenting EPA's decision. EPA's selected remedy must protect human health and the environment (i.e. accomplish all remedial action objectives including satisfying all ARARs and relevant and appropriate TBCs), maintain that protection over time, and minimize untreated waste;

8. provide all required data and data analysis needed to prepare 100% remedial engineering designs for each potential remedial action alternative;

9. provide all required data and data analysis needed to prepare a natural resource damage assessment as required by any designated Site natural resource trustee.

Note that the above list may not be complete.

C. SCOPING DELIVERABLES AND ACTIVITIES

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

1. Host a Site Visit

Respondents shall host a Site visit for EPA representatives and EPA designated contractors. The Respondents shall conduct the Site visit with EPA representatives during the project scoping phase to assist in developing a conceptual understanding of sources and areas of contamination as well as potential exposure pathways and receptors at the Site. During the Site visit the Respondents should record and highlight the Site's physiography, hydrology, geology, and demographics, as well as natural resource, ecological and cultural features. This information shall be utilized to prepare the RI/FS work plan. Respondents shall inform the EPA Project Coordinator at least two

weeks prior to this Site visit. The EPA RPM and other EPA representatives may choose to accompany the Respondents on this Site visit.

2. * Monthly Progress Report

The Respondents shall provide progress reports to EPA by the tenth day of each calendar month, commencing after the first full month after the Administrative Order becomes effective. At a minimum, with respect to the preceding month, these progress reports shall (1) describe the actions taken to comply with the Administrative Order (including this Statement of Work), (2) include all results of sampling and tests and all other data received by any Respondent including a list of samples for which for results have not yet been received, (3) describe RI/FS work planned for the next two months with schedules relating such work to the overall project schedule for RI/FS completion, (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, (5) a summary of items submitted to EPA under the Order during the reporting period, and (6) a description of all problems anticipated in the next two months following the reporting period.

3. * Work Plan for Vadose Investigation South of Three Hangars.

In conjunction with collection and analysis of existing data, the RI/FS Guidance allows for the implementation of limited additional studies during the scoping phase of the RI/FS. The EPA and the Respondents have agreed to conduct limited field work in an area south of the three hangars area during the scoping phase. In order to accomplish this limited evaluation of the vadose zone south of the three hangars, the following objectives will be addressed:

1. Investigate the extent of volatile and semivolatile organic compounds in the vadose zone in the area southwest of the three hangars.

2. Investigate the vertical and lateral extent, the hydraulic gradient, and the hydraulic connection with the upper regional divided aquifer, of the groundwater in the "90-foot, perched" aquifer unit.

3. Determine whether metals, volatile or semivolatile organic compounds are present in the groundwater of the upper regional divided aquifer in the area southwest of the three hangars.

This limited vadose zone investigation will be completed early in the scoping phase of the RI/FS, and prior to submission of the Existing Data Report. A Work Plan and Sampling and Analysis Plan addressing the objectives outlined above will be submitted to EPA for review and approval in accordance with the schedule in Attachment #2.

4. * Collect and Submit a Comprehensive List of Existing Site Data

The Respondents shall gather, collate, and submit a list of existing Site background information and data relating to the Site. Data to be listed shall include all available data relating to the varieties and quantities of hazardous substances at the Site and results from any previous sampling events that may have been conducted. The Respondents shall refer to Table 2.1 of the RI/FS Guidance for a comprehensive list of data collection information sources.

Because EPA is already in possession of some existing Site data, the Respondents shall submit to EPA a comprehensive list (indicating document or record title, author, date, and topic). The data list shall be organized by topic to the extent possible. The data list shall be compiled, reviewed, and submitted to EPA prior to submission of the Existing Data Report described below (Section C.6).

5. Underground Storage Tank (UST) Coordination Memorandum

The Respondents shall submit to EPA a technical memorandum regarding UST Site characterization data. This memorandum shall include a list of USTs, including the location, volume, dates of installation/removal, tank contents, construction material, and present status of all USTs that have been and/or are currently located at the Site, if known. Copies of investigation and remediation reports submitted to regulatory agencies regarding Site USTs shall be included in this submission to EPA. Ultimately, the RI Report shall also include any determinations made by EPA and the Arizona Department of Environmental Quality regarding any future UST remediation at the Site and document required coordination with any sampling and/or remediation efforts at the Site pursuant to and/or subsequent to this SOW. This technical memorandum may be submitted in the Existing Data Report.

6. * Complete and Submit an Existing Data Report

Respondents shall prepare and submit to EPA a report which documents the Respondents' evaluation of existing data and the Respondents' results and conclusions from the evaluation. The

primary objective of the evaluation is to determine the extent that existing data may be used to satisfy the Site-specific objectives defined above (Section B) and to identify any additional data that must be developed as part of a RI/FS.

This report shall contain the following components:

(1) a brief Site history (including an evaluation of available historical aerial photographs and a summary analysis of the history of releases by which contaminants entered the environment). As a preliminary indication of the nature of contaminants potentially released at the Site and the locations where such releases may have occurred, Respondents will exercise best efforts to provide a complete list of all present and former tenants who leased land and facilities within the Site boundaries that may have contributed to vadose zone contamination at the Site. For each tenant listed, the Respondents will provide the general location of the leased land and/or property of said tenant, an indication of the nature of business conducted by the lessee on the property and any information concerning the types and volumes of chemicals employed in the lessee's operations that could potentially be released to the environment to the extent such information is known after use of best efforts. For each tenant who has previously submitted a response to a RCRA § 3007 letter, that letter will be used in this report, and as allowed by law, EPA will provide to the Respondents a copy of all such responses;

(2) a brief Site description highlighting the physical characteristics of the Site and surrounding area that may affect the fate and transport of chemical contaminants;

(3) a detailed accounting of the existing Site data and assessment of the quality of the data. When assessing data quality, consider all available quality assurance/quality control (QA/QC) documentation with respect to appropriate data quality objectives (DQOs);

(4) a detailed, point-by-point analysis of the adequacy of the existing database toward satisfying each of the Site-specific objectives identified in section B.3. of this task (or likely to be identified as important at a later time); and

(5) a preliminary list of data gaps and data needs not satisfied by the existing database, which will have to be generated during the RI/FS.

Determination of the adequacy and suitability of the data for satisfying particular Site-specific objectives (number (4) above) shall include (but is not limited to):

(a) the level of available documentation (i.e. are locations for sample collection adequately indicated and are sample collection, preparation, and analysis methods, which were employed to produce the data, properly documented?);

(b) the quality of the data collected (including consideration of the adequacy of precision, accuracy, representativeness, and completeness). The adequacy of detection limits achieved must also be addressed; and

(c) the relevance of data based on the time of collection and the appropriateness of the parameters measured.

Existing data eliminated from further consideration for any of the above limitations shall be properly identified along with the reason for rejection. Existing data to be used for specified, limited purposes shall also be identified.

Existing data proposed for inclusion in the RI/FS and Site evaluation should be collated and presented in tabular form along with all information necessary to confirm the quality of the data (including documentation of methods used for sample collection, preparation, and analysis). To the extent feasible, data is to be provided on a computerized database that can be manipulated on an IBM (or compatible) personal computer.

The more precisely that data gaps and data needs can be defined including both the type and quality of the data, the easier it will be to complete a RI/FS work plan. To the extent possible, for example, describe the number, type, and location of additional samples to be collected. None of these decisions should be arbitrary, but should be based on the required quality of the data to be collected.

One of the more critical aspects of the evaluation of existing data is a determination of the extent to which potentially significant sources of contamination at the Site have been identified. Sufficient effort must be expended to permit identification, location and characterization of all potential contamination sources including identification of all hazardous substances deposited at each source area. Document that, to the

extent possible, all available photographs, historical records, regulatory data, employee interviews, and other pertinent information relating to hazardous substance use, storage, transport, and disposal have been identified and reviewed. Note, however, that efforts to identify sources from existing data frequently must be supplemented by additional sampling and analysis as part of the RI/FS.

7. * RI/FS Goals Refinement Meeting

Once existing Site information has been analyzed and an understanding of the preliminary Site conceptual model has been determined by EPA, the Respondents shall review and refine the PRGs that have been identified in Section B.2 of this Task for each actually or potentially contaminated medium. The revised PRGs shall be presented in a technical meeting with EPA. Respondents may petition for modification to any PRG at any time during the RI/FS by Respondents' preparation and submission of a technical memorandum regarding such modification for EPA review and approval.

As part of the refinement of PRGs, the Respondents shall conduct a preliminary search to identify potential state and federal ARARs (chemical specific, location specific, and action specific) and TBCs to be presented at the meeting and included in the RI/FS Work Plan. Particular attention should be focused on any defined clean-up levels for soil (which may translate into performance standards for remedial actions). A preliminary list of such ARARs will be included as part of the RI/FS Work Plan. The preliminary list of ARARs will continue to be revised, however, as Site conditions, contaminants, and remedial action alternatives are better defined.

At this meeting, the Respondents shall identify a preliminary range of broadly defined potential remedial action alternatives and associated technologies for those locations where sufficient data exist. The range of potential alternatives shall encompass (where appropriate) alternatives in which treatment significantly reduces the toxicity, mobility, or volume of the waste; alternatives that involve containment with little or no treatment; and a no action alternative.

If remedial actions involving treatment have been identified by the Respondents or EPA, treatability studies shall be required except where the Respondents can demonstrate to EPA's satisfaction that they are not needed. Where treatability studies are needed, initial treatability testing activities (such as research and study design) shall be planned to occur concurrently with Site investigation and characterization activities. A

preliminary list of potential treatability studies shall be presented at the meeting.

Also at this meeting, a discussion of (or distribution of) relevant EPA guidance documents and written policies regarding the conduct of a RI/FS shall occur. To the extent practicable, such pre-scoping shall include input by EPA regarding the general data requirements and scheduling of the baseline risk assessment, the preliminary data quality objectives appropriate for the risk assessment, and any other preliminary RI/FS objectives.

8. * Complete and Submit a RI/FS Work Plan

Respondents will prepare and submit a RI/FS Work Plan to EPA for review and approval. The Work Plan will be developed in conjunction with a sampling and analysis plan and a Site health and safety plan, although each plan may be delivered under separate cover. The Work Plan will include a comprehensive description of the work to be performed and include specification of all sample collection, handling, preparation, and analysis methodologies to be utilized and a corresponding schedule for completion.

Note that the RI and FS are interdependent and the work plan will be designed assuming that the two will be conducted concurrently so that data collected in the RI may influence the development of remedial alternatives in the FS. In turn, the development of remedial alternatives in the FS may dictate additional data needs and the scope of the treatability studies that may have to be incorporated into the RI.

The Work Plan will include a summary of background information including a description of the Site's physiography, hydrology, geology, and demographics and the Site's ecological, cultural, and natural resource features. A summary of existing data defining the physical and chemical characteristics of the contaminants identified and their distribution among Site environmental media will also be provided. The Work Plan will also incorporate a synopsis of the Site history, including a description of previous response actions conducted at the Site by local, state, federal, or private parties.

The Work Plan will provide a discussion of the rational used in developing the RI/FS activities. Beginning with a statement of existing and potential problem(s) posed by contaminants identified at the Site, the Work Plan will trace the evaluation of existing data through the development of a Site conceptual model to development of a Site evaluation strategy that defines precise, Site-specific objectives including data quality objectives. Results and conclusions from reports developed

during previous RI/FS scoping activities (including the Existing Data Report, the UST Coordination Memorandum and the RI/FS Goals Refinement Meeting) will also be summarized and cited as appropriate. EPA's comments on all three of these activities shall be incorporated into the Work Plan.

All exposure pathways of potential concern in or from groundwater, soil and soil gas, which must be addressed as part of the Site evaluation, will be identified as part of the Site conceptual model. To the extent that components (sources, mechanisms of release, mechanisms and media of transport, points of exposure, potential receptors, and routes of exposure) of each such pathway can be specified and characterized based on existing Site information, the conceptual model will include a detailed characterization of the components of each potentially active exposure pathway. Development of conceptual models for specific source areas within the Site may also be necessary to adequately support source specific field sampling plans.

Because it is the ultimate use to which data will be applied (including, if possible, the specific statistical tests to which the data will be subjected) that determines both the type and the quality of data required to complete a baseline risk assessment and an evaluation of remedial alternatives, Site-specific RI/FS objectives will be derived directly from the Site evaluation strategy. Although at this stage, only general data uses may be defined, the strategy for Site evaluation will be developed as the understanding of the Site progresses.

A preliminary set of considerations for data use (to be specified in the Site evaluation strategy) include the following:

(1) parameters required to characterize contaminant fate and transport (both in the vadose zone and in the groundwater) will have to be defined sufficiently to allow such characterization to be determined to within a pre-defined level of certainty proposed by Respondents and approved by EPA;

(2) measurements will likely be used as input parameters to EPA-approved vadose zone and/or groundwater flow/ transport models to allow quantification of potential contaminant migration. Such calculations (and, therefore, the required input parameters) will have to be completed to a pre-defined level of certainty proposed by Respondents and approved by EPA;

(3) parameters defining the performance of various remedial alternatives will have to be characterized to allow a determination of the expected performance of each

remedial alternative to within a pre-defined level of certainty proposed by Respondents and approved by EPA. Treatability studies may have to be designed and conducted to provide the required data.

(4) data considerations described above shall address characterization of extent of contamination in the regional aquifer. If regional groundwater contamination is detected, the areal extent of said contamination and subsequent RI/FS analyses will be carried out under the existing groundwater Consent Decree (defined in the Administrative Order) or under this Administrative Order, as determined by EPA.

The Site evaluation strategy will also incorporate the preliminary identification of remedial alternatives and identify data required to characterize each such alternative sufficiently to allow an evaluation of cost-effectiveness. Because compliance with ARARs must be addressed in addition to the consideration of potential risks, the Site evaluation strategy will also incorporate a comprehensive list of all ARARs and TBCs identified that potentially relate to the Site.

The remainder of the Work Plan is to provide a detailed description of the tasks to be performed during Site investigation and evaluation. The description shall include specification of the data to be developed under each task (including completion of the baseline risk assessment by EPA) and the work products to be submitted to EPA under each task. A schedule for all such activities must be provided. The scope and schedule of work must provide for the preparation and submission of monthly progress reports and regular review meetings.

Presentations to EPA are also to be scheduled at the conclusions of each major phase of the RI/FS in conjunction with Technical Advisory Committee meetings.

Both a project management plan and a data management plan are also to be included. The data management plan must specify requirements for proper documentation of project management tasks, hardware and software to be employed for data management, the format for data management, and back-up contingencies. Respondents shall refer to Appendix B of the RI/FS Guidance for a comprehensive description of the contents of the required Work Plan.

Because the work required to perform a RI/FS cannot be fully defined at the outset, a RI/FS is frequently phased in accordance with the Site's complexity and the extent of existing information. To account for unforeseen developments, the work

plan and schedule of deliverables may have to be modified as the RI/FS progresses pursuant to Section XIII (Modification of the Work Required) of the Administrative Order. Final decisions regarding the need for additional data required to satisfy the range of Site-specific objectives will be rendered by EPA.

a. Sampling and Analysis Plan

The Respondents shall prepare a sampling and analysis plan (SAP) to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data meet EPA-approved 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).

FSPs. Any FSP shall define in detail the sampling and data gathering methods that will be used on the project. For both field activities and any required treatability studies, the sampling plan must specify (at a minimum):

- the types of samples to be collected;
- the matrix (or matrices) to be sampled;
- the target analytes;
- methods to be used for sample collection, preparation, and analysis;
- the number of samples to be collected;
- the detailed procedure to be employed for selecting sampling locations in each matrix to be sampled; and
- sampling requirements for QA/QC.

None of the above parameters should be selected arbitrarily, but should be based on careful consideration both of the types of data and the quality of the data required to satisfy all Site objectives. To the extent possible, data quality objectives (including precision, accuracy, representativeness, and completeness) should be specified precisely based on the intended use for the data (as specified in the Site evaluation strategy).

In accordance with EPA Region IX FSP guidance (see Attachment #1), Respondents shall prepare FSPs for each potential source and/or area of vadose zone and groundwater contamination within the Site, as identified by the Respondents and approved by EPA. Or, at a minimum, Respondents shall prepare a FSP for vadose zone investigations and a FSP for groundwater

investigations. The individual FSPs may be compiled into a single document.

Each FSP shall describe in detail the sampling technology to be used, proposed methods of implementation, and why it is appropriate to each source area. Geophysical investigations, where appropriate, may be implemented for any landfill source areas. Shallow and depth-specific soil gas sampling may be implemented for any potential volatile organic compound (VOC) contaminant vadose zone source area. In order to obtain design criteria for a soil vapor extraction (SVE) system, a focused, expedited, pilot SVE FSP may be appropriate. For a given location, an adequate number of groundwater monitoring wells shall be proposed, installed, and sampled by Respondents to characterize groundwater flow and quality in areas where groundwater sampling or vadose zone sampling and/or modeling indicate potential impact to such groundwater. If regional aquifer contamination is detected, the areal extent of such contamination will be characterized under the existing Consent Decree or this Administrative Order, as determined by EPA.

QAPP. The QAPP shall describe the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols that will be used to document the quality of any collected data with respect to data quality objectives (DQOs) defined for each data use. DQOs defined for the Site may include, but are not limited to:

- an acceptable level of precision;
- an acceptable level of accuracy;
- an acceptable sensitivity (detection limit);
- adequately defined representativeness;
- a quantifiable level of comparability; and,
- an acceptable level of completeness

for any data set collected.

DQOs defined for the Site shall satisfy all data quality requirements for the baseline risk assessment to be performed by EPA. DQOs shall also satisfy the Site's designated Natural Resource Trustee's data requirements, as identified by EPA, for any natural resource damage assessment to be performed at the Site. In addition, the sensitivities (detection limits) defined as acceptable will be consistent with concentration levels in

various media defined as remedial action objectives in the National Contingency Plan, as revised.

The effect of procedures for sample collection, handling, transport, custody, preparation, and analysis on the ultimate level of data quality (performance) achieved will all be addressed in the QAPP. Procedures for data reduction, validation, and reporting and requirements for personnel qualifications will also be addressed in terms of their impact on data quality. Field personnel should be available for EPA QA/QC training and orientation where applicable.

The Respondents shall demonstrate in advance (to EPA's satisfaction) that each laboratory it may use is qualified to conduct the proposed work. This includes experience and past performance with the use of methods and protocols employed for the preparation and analysis of samples for the determination of each of the chemicals of concern identified in the media of interest. Laboratories retained must be able to perform such analyses and achieve detection and quantitation limits that are consistent with the DQOs approved for the Site by EPA. The laboratory must be able to provide a written description of its internal QA program, and the program must have been, or be, approved 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 by EPA will be used. QA/QC procedures implemented in association with any particular method will be equivalent to that required in the QAPP. If the laboratory is not in the CLP program, a laboratory QA program must be submitted for EPA review and approval. EPA may require that the Respondents submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on professional personnel qualifications, equipment and material specifications, and performance documented in any inter-laboratory exchanges or formal, relevant, proficiency programs. The Respondents shall provide assurances that EPA has access to laboratory professional personnel, equipment and records for sample collection, handling, transportation, and analysis.

b. Site Health and Safety Plan

A health and safety plan shall be prepared in conformance with the Respondent's health and safety program, and in compliance with OSHA regulations and protocols. The Site health and safety plan shall include the 11 elements described in 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. It should be noted that EPA does not "approve" the Respondents' health and safety plan, but rather EPA reviews it to ensure that all necessary elements are included, and that the plan provides for the protection of human health and the environment.

II. TASK 2: COMMUNITY RELATIONS

The development and implementation of community relations activities are the responsibility of EPA. The critical community relations planning steps performed by EPA include conducting community interviews and developing a community relations plan, for which Respondents may provide comment and input. Although implementation of the community relations plan is the responsibility of EPA, the Respondents may assist by providing information regarding the Site's history and participating in public meetings. EPA shall prepare one or more baseline risk assessment memoranda which will summarize the toxicity assessment and exposure assessment components of the baseline risk assessment. EPA will make these memoranda available to all interested parties for comment and place them in the Administrative Record. (EPA is not required, however, to formally respond to significant comments except during the formal public comment period on the proposed plan.) All Respondents conducted community relations activities shall be subject to oversight by EPA.

III. TASK 3: SITE CHARACTERIZATION (RI/FS Guidance, Chapter 3)

As part of the RI, the Respondents shall perform the activities described in this task, including the preparation of a Site characterization summary and RI report addressing the vadose zone. The overall objective of site characterization is to describe areas of a site that may pose a threat to human health or the environment. This is accomplished by first determining a site's physiography, geology, and hydrology. Groundwater will be investigated only to clarify the potential impact of vadose zone contamination. Surface and subsurface pathways of migration shall be defined. The Respondents shall identify the sources of contamination and define the nature, extent, and approximate volume of the sources of contamination, including their physical and chemical characteristics, as well as their concentrations in the affected media. The Respondents shall also investigate 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. Using this information, cortaminant fate and transport is then determined and projected.

During this phase of the RI/FS, the RI/FS Work Plan, SAP, and health and safety plan are implemented. Field data are collected and analyzed to provide the information required to accomplish the objectives of the RI/FS. The Respondents shall notify EPA at least ten working days (see Administrative Order Section XIII) in advance of the field work regarding the planned dates for field activities, including field layout of sample locations, drilling, installation of wells, initiation of sampling, installation and calibration of equipment, pump tests, and initiation of analysis and other field investigation activities.

The Respondents shall demonstrate that the laboratory and type of laboratory analyses that will be utilized during Site characterization meet 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 the Respondents to supplement the work specified in the initial RI/FS Work Plan. In addition to the deliverables below, the Respondents shall provide the monthly progress reports (as described in Section I.C.2) and participate in meetings at major points in the RI/FS in addition to regular Technical Advisory Committee (TAC) meetings.

A. Field Investigation (3.2)

The field investigation includes the gathering of data to define Site physical, chemical, and biological characteristics, sources of contamination, and the nature and extent of contamination at the Site. These activities shall be performed by the Respondents in accordance with the RI/FS Work Plan and SAP. At a minimum, this shall address the following:

1. <u>Implement and document field support activities</u> (3.2.1)

The Respondents shall initiate field support activities following approval of the RI/FS Work Plan and SAP. Field support activities may include obtaining access to the Site, scheduling, and procuring equipment, office space, laboratory services, and/or contractors. The Respondents shall notify EPA at least ten working days prior to initiating each phase of field support activities so that EPA may adequately schedule oversight tasks.

2. <u>Investigate and define Site physical characteristics</u> (3.2.2)

The Respondents shall collect data on the physical, chemical, and biological characteristics of the Site and its surrounding areas including the physiography, geology, and hydrology, and specific physical characteristics identified in the RI/FS Work

Plan. This information shall be ascertained through a combination of physical measurements, observations, and sampling efforts and will be utilized to define potential exposure pathways (see Risk Assessment guidance) including associated human and ecological receptor populations. In defining the Site's physical characteristics, the Respondents shall also obtain sufficient engineering data for the projection of contaminant fate and transport, and development and screening of remedial action alternatives, including information to assess treatment technologies.

3. Define sources of contamination (3.2.3)

The Respondents shall locate each source of contamination. Potential contamination sources will be located by (1) examination of historical records of land use and industrial practices and historical aerial photographs, (2) interviews, including depositions as allowed by the Administrative Order, with current and former employees, (3) Site inspections, and (4) use of field screening methods such as soil gas surveys and geophysical surveys.

Vadose Zone. Geophysical investigations, where appropriate, may be implemented for any landfill source areas. Shallow and depth-specific soil matrix and soil gas sampling may be implemented for any potential volatile organic compound (VOC) contaminant vadose zone source area. The primary purpose of a shallow soil gas program shall be to identify areas of concern, which require depth-specific soil gas surveys or collection of soil samples for laboratory analysis. Soil gas data or laboratory analyses of soil samples are needed for input into a vadose zone model which provides an assessment of potential impacts to groundwater quality.

Defining the source(s) of contamination shall include analysis of the potential for contaminant release (e.g., long term leaching from soil), contaminant mobility and persistence, and characteristics important for evaluating remedial actions, including information to assess treatment technologies. Long term leaching of VOC contaminants may be assessed by the VLEACH vadose zone model or similar EPA-approved model. Data requirements for running VLEACH or other EPA-approved vadose models include obtaining hydrologic data (i.e recharge rate, depth to groundwater, etc.), Site-specific chemical and physical soil parameters (i.e. porosity, organic carbon content, etc.) and contaminant concentrations. All input data for running VLEACH, or other similar EPA-approved model, shall have EPA approval.

Groundwater. An adequate number of groundwater monitoring wells shall be proposed, installed, and sampled by Respondents for any existing and/or potential areas of groundwater contamination (i.e. areas where vadose zone or groundwater sampling and subsequent modeling indicate potential impact, as determined by EPA, to groundwater quality). Therefore, installation of new or additional groundwater monitoring wells may be pursuant to analysis of existing data from vadose zone and/or groundwater sampling at the Tucson International Airport Superfund site or pursuant to the analysis of data resulting from any FSP under this Administrative Order.

4. Determine the nature and extent of contamination (3.2.4)

The Respondents shall gather information to determine the nature and extent of contamination as a final step during the field investigation. The Respondents shall use the Site physical data and source location information to determine the most significant sources from which contaminants may have been released. The Respondents shall then implement an iterative sampling program as described in the RI/FS Work Plan and Sampling and Analysis Plan to fully characterize the location and concentration of contaminants in the subsurface. Once the nature and extent of the contaminated zone is known, this information will be used in the Risk Assessment and to determine the most appropriate remedial action alternatives.

B. Data Analyses (3.4)

1. * Technical Memorandum on Modeling of Site Characteristics

Where Respondents or EPA propose that modeling is appropriate, Respondents shall submit for EPA review and approval a technical memorandum on modeling of Site characteristics prior to the use of any Site model in any future deliverable. Where modeling is utilized in future deliverables, Respondents shall make available to EPA all data, input assumptions, and programming, together with a sensitivity analysis.

C. Data Management Procedures (3.5)

The Respondents shall consistently document the quality and validity of field and laboratory data compiled during the RI.

1. Document field activities (3.5.1)

Information gathered during Site characterization shall be consistently documented and adequately recorded by the Respondents in well maintained field logs and laboratory reports. The method(s) of documentation must be specified in the 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 personnel, analytical results, adherence to prescribed protocols, problems encountered, corrective measures, and/or data deficiencies.

2. Maintain sample management and tracking (3.5.2; 3.5.3)

The Respondents shall maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only analytical data, validated pursuant to the QAPP, are reported and utilized in the development and evaluation of remedial alternatives. Analytical results developed under the Work Plan shall not be included in any Site characterization reports unless accompanied by or cross-referenced to a corresponding QA/QC report. In addition, the Respondents shall 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)

The Respondents shall prepare the preliminary Site characterization summary.

1. * Preliminary Site Characterization Summary (3.7.2)

The Respondents shall prepare a concise Site characterization summary for EPA review and comment. The Site characterization summary shall provide EPA with a preliminary reference for developing the risk assessment, and evaluating the development and screening of remedial alternatives and the refinement and identification of ARARs.

This summary shall review the investigative activities that have taken place, and describe and display Site data documenting the location and characteristics of surface and subsurface features and contamination at the Site including the affected medium, location, types, and concentrations of contaminants. In addition, the variation in concentration of each contaminant through each of the affected media shall be documented and discussed. The Respondents shall analyze and evaluate the data to describe: (1) Site physical characteristics, (2) contaminant source characteristics, (3) nature and extent of contamination, and (4) contaminant fate and transport. Results of the Site physical characteristics, source characteristics, and extent of contamination analyses are utilized in the analysis of contaminant fate and transport. The evaluation shall include the

actual and potential magnitude of releases from the sources, and horizontal and vertical spread of contamination as well as mobility and persistence of contaminants.

This data interpretation shall include use of EPA-approved Site models. Respondents shall provide surface and at-depth soil contaminant concentration contour maps of areas where contaminant concentrations exceed background levels and groundwater contaminant concentration contour maps. Results from Respondents use of an EPA-approved vadose zone model shall document any vadose zone target areas that impact underlying groundwater quality in excess of the preliminary groundwater action level for each contaminant. Respondents use of an EPA-approved groundwater model shall document groundwater flow characteristics, and groundwater contaminant concentrations contours including but not limited to characterization of existing and future contaminant transport from the vadose zone.

This summary shall also include a section consisting of a detailed, point-by-point analysis of the Respondents' progress in accomplishing all Site-specific objectives, as updated by Respondents and approved by EPA, originally listed in section I.B.3. of this SOW. If any Site-specific objectives remain unaccomplished, Respondents shall identify the necessary activities required to successfully complete all such objectives including the preparation and implementation of any additional sampling and analysis plans. Furthermore, the Respondents shall also discuss any data gaps identified by EPA and collect the data that is needed to complete the baseline risk assessment. Also, this evaluation shall provide any information relevant to Site characteristics necessary for 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 shall meet the DQOs developed in the QA/QC plan stated in the SAP (or revised during the RI).

This summary, after being revised to address EPA's comments on the summary, shall be incorporated into the RI Report.

2. * Remedial Investigation (RI) Report (3.7.3)

The Respondents shall prepare and submit a RI report which shall include a vadose zone RI and a groundwater RI to EPA for review and approval. This report shall summarize results of field activities to characterize the Site, sources of contamination, nature and extent of contamination, and the fate and transport of contaminants. The Respondents shall refer to the RI/FS Guidance for an outline of the report format and contents. Following comment by EPA, the Respondents shall

prepare a final RI report that satisfactorily addresses EPA's comments.

IV. TASK 4: BASELINE RISK ASSESSMENT (3.4.2)

EPA shall retain responsibility for a baseline risk assessment which shall identify and characterize the toxicity and levels of hazardous substances present, contaminant fate and transport, the potential for human or environmental exposure, or both, and the risk of potential impacts or threats on human health and the environment. It shall provide the basis for determining whether or not remedial action is necessary, and a justification for performing whatever remedial actions are selected. The procedures to perform a baseline risk assessment for human health are outlined in EPA's Superfund Public Health Evaluation Manual (SPHEM). Other resources that EPA may utilize when performing the baseline risk assessment include: EPA's Superfund Exposure Assessment Manual (SEAM), the Integrated Risk Information System (IRIS), the Public Health Risk Evaluation Database (PHRED), the Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual, the Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, and any additional EPA Region IX guidance regarding risk assessment and risk management.

Risk Assessment is one objective of data collection in the RI/FS. To the extent possible, it is useful to identify all risk assessment data needs in the scoping process described in Task 1.

Based on a review of the Existing Data Report, and as part of their review comments to said report, EPA may provide a preliminary conceptual model of the Site that identifies the type and duration of potential exposures routes, key exposure points, and attendant receptors for each medium. Identification of potential exposure pathways is one element in the determination of data needs and data quality objectives (e.g. appropriate quantitation limits) for risk assessment. EPA should determine if non-routine (lower) quantitation limits will be required.

Based on a review of Respondent's RI/FS Work Plan, EPA may provide a First Risk Assessment Memorandum. This Memorandum may encompass drafts of Chapters 1,2 and 3 of the baseline risk assessment and may include a list of potential contaminants of concern, a toxicity assessment, and a conceptual model.

Based on a review of Respondents' Technical Memorandum on Site Modeling and the Preliminary Site Characterization Summary, EPA may provide a Second Risk Assessment Memorandum. This Memorandum may encompass drafts of Chapters 4,5, and 6 of the baseline risk assessment including an exposure assessment, an

environmental evaluation, a risk characterization, and proposed clean-up levels.

Furthermore, in addition to the above and to the extent practicable and allowable, EPA will provide the Respondents information regarding the baseline risk assessment throughout the RI/FS.

V. TASK 5: TREATABILITY STUDIES (RI/FS Manual, Chapter 5)

A. Treatability Studies Scoping

If necessary, treatability testing shall be performed by the Respondents to assist in the detailed analysis of alternatives. In addition, if applicable, testing results and operating conditions shall be used in the detailed design of the selected remedial technology. The following activities shall be performed by the Respondents.

1. * Candidate Technologies Meeting (5.2;5.4)

The Respondents shall conduct a meeting with EPA regarding the identification of candidate remedial technologies for treatability studies. Candidate technologies shall cover the range of technologies required for alternatives analysis (Task 6 A.) At this meeting, Respondents shall discuss the results of a literature survey to gather information on performance, relative costs, applicability, removal efficiencies, operation and maintenance (O&M) requirements, and implementability of candidate technologies. Respondents shall either demonstrate that treatability testing is not needed or present proposed technology (ies) to be tested and the steps and data necessary to evaluate and initiate the treatability study program. The specific data requirements for the testing program shall be determined and refined during Site characterization and the development and screening of remedial alternatives (Tasks 3 and 6, respectively) and finally documented in the Treatability Work Plan. Certain candidate technologies may have been demonstrated sufficiently so that treatability studies are not necessary. For these technologies, the Respondents shall present information to document the performance of the technology under conditions similar to those at the Site, in lieu of treatability studies.

B. Treatability Studies and Deliverables (5.5; 5.6; 5.8)

If treatability studies are deemed necessary by EPA, the deliverables that are required include a work plan, a sampling and analysis plan, and a final treatability evaluation report.

EPA may also require a treatability study health and safety plan, where appropriate.

1. * Treatability study work plan (5.4, 5.5)

Once a decision has been made by EPA to perform treatability studies, the Respondents and EPA shall 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.

The Respondents shall prepare a treatability study work plan or amendment to the original Site 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 studies should be documented as well. If pilot scale treatability testing is to be performed, the pilot scale work plan shall describe pilot plant installation and start-up, pilot plant operation and maintenance procedures, operating conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed health and safety plan. Draft clean-up levels should be stated and translated into process performance goals prior to treatability testing. If testing is to be performed off-Site, permitting requirements shall be addressed.

2. * Treatability study sampling and analysis plan (5.5)

If EPA determines that the original QAPP or FSP is not adequate for defining the activities to be performed during the treatability tests, a separate treatability study SAP or amendment to the original Site SAP shall be prepared by the Respondents for EPA review and approval. Task 1, Item 7.a of this statement of work provides additional information on the requirements of the SAP.

3. * Treatability study health and safety plan (5.5)

If the Site health and safety plan is not adequate for defining the activities to be performed during the treatability tests, a separate or amended health and safety plan shall be developed by the Respondents. Task 1, Item C.8.b of this Statement of Work provides additional information on the

requirements of the health and safety plan. EPA does not "approve" the treatability study health and safety plan.

4. * Treatability study evaluation report (5.6)

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

VI. TASK 6: DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES (RI/FS Manual, Chapter 4)

The development and screening of remedial alternatives is performed to develop an appropriate range of waste management options that shall be evaluated. This 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. This development and screening process shall be applied in a concurrent yet separate fashion to each medium, including the vadose zone and the groundwater. The following activities shall be performed by the Respondents during the development and screening of vadose zone and groundwater remedial alternatives.

A. Development and Screening of Remedial Alternatives (4.2)

The Respondents shall begin to 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 task.

1. * Meeting on Remedial Action Objectives (4.2.1)

Based on EPA's baseline risk assessment, the Respondents shall review and if necessary modify the Site-specific remedial action objectives, specifically the PRGs, that were originally established in Section I.B.2. The revised PRGs shall be presented in a technical meeting for EPA review and approval.

These modified PRGs shall 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).

2. Develop general response actions (4.2.2)

The Respondents shall develop general response actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the remedial action objectives.

3. Identify areas or volumes of media (4.2.3)

The Respondents shall 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 shall also be taken into account.

4. Identify, screen, and document remedial technologies (4.2.4; 4.2.5)

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

5. Assemble and document alternatives (4.2.6)

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

6. Refine alternatives

The Respondents shall refine the remedial alternatives to identify contaminant volume addressed by the proposed process and sizing of critical unit operations as necessary. As determined by EPA, sufficient information shall be collected for an adequate comparison of alternatives. PRGs for each chemical in each medium shall also be modified as necessary to incorporate any new risk assessment information presented in EPA's baseline risk assessment report. Additionally, action-specific ARARs shall be updated as the remedial alternatives are refined.

7. * Memorandum on Development and Screening of Alternatives (4.3, 4.5)

The Respondents 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 shall 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 shall preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives shall include options that use treatment technologies and permanent solutions to the maximum extent practicable. The Respondents shall prepare a technical memorandum summarizing the results and reasoning employed in screening, arraying alternatives that remain after screening, and identifying the action-specific ARARs for the alternatives that remain after screening.

This technical memorandum shall also include a section summarizing the work performed in and the results of each task above, including an alternatives array summary. These shall be modified by the Respondents if required by EPA's comments to assure identification of a complete and appropriate range of viable alternatives to be considered in the detailed analysis. This deliverable shall document the methods, rationale, and results of the alternatives screening process.

VII. TASK 7: DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES (RI/FS Guidance, Chapter 6)

The detailed analysis shall be conducted by the Respondents 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 the Respondents during the FS.

A. Detailed Analysis of Alternatives (6.2)

The Respondents shall conduct a detailed analysis of alternatives which shall 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.

1. Apply nine criteria and document analysis (6.2.1, 6.2.4)

The Respondents shall apply nine evaluation criteria to the assembled remedial alternatives to ensure that the selected remedial alternative shall be protective of human health and the environment; shall be in compliance with, or include a waiver of, ARARs; shall be cost-effective; shall utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable; and shall 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 of Arizona 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, the Respondents shall provide: (1) a description of the alternative that outlines the waste management strategy involved and identifies ARARs associated with each alternative; and, (2) a discussion of the individual criterion assessment. If the Respondents do not have direct input on criteria (8) State of Arizona acceptance and (9) community acceptance, these will be addressed by EPA.

2. * Report on Comparative Analysis and Presentation to EPA (6.2.5; 6.2.6)

The Respondents shall perform a comparative analysis between the remedial alternatives. That is, each alternative shall be compared against the others using the evaluation criteria (as described above) as a basis of comparison. Identification and

selection of the preferred alternative are reserved by EPA. The Respondents shall prepare a technical memorandum summarizing the results of the comparative analysis. Respondents shall also provide EPA a presentation on this technical memorandum, summarizing all RI and FS activities to date.

B. Detailed Analysis Deliverables (6.5)

In addition to the technical memorandum summarizing the results of the comparative analysis, the Respondents shall submit a FS report to EPA for review and approval. Once EPA's comments have been addressed by the Respondents to EPA's satisfaction, the final FS report may be bound with the final RI report.

1. * Feasibility study report (6.5)

The Respondents shall prepare a FS report including a vadose zone FS and a groundwater FS for EPA review, comment, and approval. This report, as ultimately approved, adopted or amended by EPA, provides a basis for remedy selection by EPA and documents the development and analysis of remedial alternatives. The Respondents shall refer to the RI/FS Guidance for an outline of the report format and the required report content.

U.S. EPA Administrative Order; Docket Number 92-09
ATTACHMENT #1 to Appendix B

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 (revised) National Contingency Plan

"Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01.

"Interim Guidance on Potentially Responsible Party Participation in Remedial Investigation and Feasibility Studies," U.S. EPA, Office of Waste Programs Enforcement, Appendix A to OSWER Directive No. 9355.3-01.

"Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies," U.S. EPA, Office of Waste Programs Enforcement, OSWER Directive No.9835.3.

"A Compendium of Superfund Field Operations Methods," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response,EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

"EPA NEIC Policies and Procedures Manual," May 1978, revised November 1984, EPA-330/9-78-001-R.

"Development of Data Quality Objectives; Description of Stages I and II" U.S. EPA Quality Assurance Management Staff, July 16, 1986.

"Data Quality Objectives for Remedial Response Activities, Volumes 1 and 2." U.S.EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-07B.

"Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Research and Development,Cincinnati, OH, QAMS-004/80, December 29, 1980.

"Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Emergency and Remedial Response, QAMS-005/80, December 1980.

"Users Guide to the EPA Contract Laboratory Program," U.S. EPA, EPA/540/8-89/012; EPA/9240.0-01B; December 1988.

"Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements," U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

"CERCLA Compliance with Other Laws Manual," Parts I and II, U.S.EPA, Office of Emergency and Remedial Response, August 1988 (Part I) and August 1989 (Part II), EPA/540/G-89/006 and /009 OSWER Directive No. 9234.1-01 and -02.

"Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," U.S. EPA, Office of Emergency and Remedial Response, December 1988, EPA/540/G-88/003 OSWER Directive No. 9283.1-02.

"Soil Sampling Quality Assurance User's Guide" EPA/600/4-84/043

"Characterizing Soils for Hazardous Waste Site Assessments" U.S. EPA, Office of Research and Development and Office of Solid Wastes and Emergency Response, EPA/540/4-91/003, March 1991

"Superfund Exposure Assessment Manual," U.S. EPA, Office of Emergency and Remedial Response, April 1988, EPA/540/1-88/001 OSWER Directive No. 9285.5-01.

"Risk Assessment Guidance for Superfund" Volume I: Human Health Evaluation Manual (December 1989) and Volume II Environmental Evaluation Manual (March 1989), U.S. EPA, Office of Emergency and Remedial Response, EPA/540/1-89/001 and /002, OSWER Directive No. 9285.7-01.

"Health and Safety Requirements of Employees Employed in Field Activities," U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order No. 1440.2.

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

"Final Guidance on Administrative Records for Selecting CERCLA Response Actions," U.S. EPA, Office of Solid Waste and Emergency Response, December 3, 1990, OSWER Directive No. 9833.3A-1.

"Community Relations in Superfund: A Handbook," U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9230.0-03B.

"Preparation of a U.S. EPA Region 9 Field Sampling Plan for Private and State-Lead Superfund Projects" (Document Control No. 9QA-06-89) April 1990.

"US EPA Region 9 Guidance for Preparing Quality Assurance Project Plans for Superfund Remedial Projects" (Document Control No. 9QA-03-89) September 1989.

"Laboratory Documentation Requirements for Data Validation" (Document Control No. 9QA-07-89) January 1990.

"Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites," December 1988, EPA/540/G-88/003 OSWER Directive No. 9283.1-02

"Guide to Conducting Treatability Studies Under CERCLA Interim Final)," December 1989, EPA/540/2-89/058 OSWER Directive No. 9380.0-27

"Determining Soil Response Action Levels Based on Potential Contaminant Migration to Ground Water: A Compendium of Examples," October 1989, EPA/540/2-89/057 OSWER Directive No. 9380.0-07

"Draft Guidance on Preparing Superfund Decision Documents" U.S. EPA, Office of Emergency and Remedial Response, March 1988, OSWER Directive No. 9355.

U.S. EPA AMENDED ADMINISTRATIVE ORDER
EPA REGION IX DOCKET NUMBER 92-09
ATTACHMENT #2 TO APPENDIX B

SCHEDULE OF RESPONDENTS DELIVERABLES

The appropriate Respondent(s) shall submit all deliverables to EPA in accordance with the schedule set forth below. Any deliverables sent to EPA by mail shall be postmarked no later than the due date. Those deliverables with an "(A)" following their title are subject to formal EPA approval pursuant to this administrative order while those with a "(C)" are subject to EPA review and comment only. If EPA disapproves of or requires revisions to any deliverable in whole, or in part, Respondents shall amend the deliverable and resubmit the cured deliverable to EPA within ten (10) working days of receiving EPA's comments. Upon Respondents request, EPA may, in its discretion, extend the 10-working day cure period.

DELIVERABLE	DUE
1. Periodic Progress Reports. (C)	See Statement of Work, Section I.C.2.
2. Comprehensive List of Existing Site Data (C)	Within ten (10) working days of Order effective date
3. Limited Investigative Work Plan for Vadose Zone at Three Hangers Area (A)	Within ten (10) working days of Order effective date
4. Existing Data Report (C)	Within forty (40) working days of completion of the field work[1] at the Three Hangers area as scheduled in the limited Work Plan

[1] For the purposes of this schedule, "completion of the field work" shall mean the day any Respondent or any Respondents representative receives the analytical laboratory data for the last set of environmental samples obtained pursuant to the Work Plan under which such field work is being done.

DELIVERABLE	DUE
5. RI/FS Goals Refinement Meeting	Within fifteen (15) working days of Respondents' receipt of EPA comments (which may include the Preliminary Site Conceptual Model) on the Existing Data Report
6. RI/FS Work Plan (A)	Within forty (40) working days of the RI/FS Goals Refinement Meeting day
7. Site Sampling and Analysis Plan (A)	Within forty (40) working days of the RI/FS Goals Refinement Meeting day
8. Site Health and Safety Plan (C)	Within sixty (60) working days of the RI/FS Goals Refinement Meeting day
9. Technical Memorandum on Site Modeling (A)	Within thirty (30) working days of EPA approval of the cured RI/FS Work Plan
10. Preliminary Site Characterization Summary (C)	Within forty-five (45) working days of completion of all field work as scheduled in the RI/FS Work Plan
11. Remedial Investigation Report (A)	Within forty-five (45) working days of Respondents receipt of EPA comments on the Preliminary Site Characterization Summary
12. Candidate Technologies Meeting	Within twenty (20) working days of completion of the phase I field work as scheduled in the RI/FS Work Plan

DELIVERABLE	DUE
13. (First) Treatability Study Work Plan (A) [The schedule for additional workplan(s) shall be negotiated as required and subject to EPA approval.]	Within forty-five (45) working days of the Candidate Technologies Meeting day
14. Treatability Study Sampling and Analysis Plan (A)	Within forty-five (45) working days of the Candidate Technologies Meeting day
15. Treatability Study Health and Safety Plan (C)	Within forty-five (45) working days of the Candidate Technologies Meeting day
16. Treatability Study Evaluation Report (A)	Within forty-five (45) working days of completion of treatability studies field work as scheduled in the Treatability Study Work Plan
17. Remedial Action Objectives Meeting	Within twenty (20) working days of EPA approval of the cured RI report
18. Memorandum on Screening of Alternatives (A)	Within twenty-five (25) working days of Respondents' receipt of EPA's preliminary draft Risk Assessment Report, or within twenty-five (25) working days of the Remedial Action Objectives Meeting day, or within twenty-five (25) working days of Respondents' receipt of EPA's comments on the Treatability Study Evaluation Report, whichever is later
19. Report on Comparative Analysis (A)	Within thirty-five (35) working days of EPA approval of the cured Memorandum on Screening Alternatives

DELIVERABLE	DUE
20. Presentation to EPA	Within twenty (20) working days of Respondents' submittal of the Report on Comparative Analysis
21. Feasibility Study Report (A)	Within fifty-five (55) working days of EPA approval of the cured Report on Comparative Analysis