

**STATEMENT OF QUALIFICATIONS**



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## Section 1.0 Introduction

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Cirrus Associates, L.L.C. (Cirrus) is an environmental consulting firm with offices in Dallas and Houston, Texas. Cirrus' primary objective and strength are providing high quality, cost-effective services to its clients. By concentrating its operations out of two of the largest metropolitan areas in Texas, Cirrus is positioned to be an efficient, cost effective provider of environmental consulting services in the greater Texas and Gulf Coast geographic areas. In today's extremely competitive environmental consulting industry, geographically focused firms who employ high quality personnel can offer a personalized level of consulting advice to their clientele at a reasonable cost. Cirrus is such a firm.

Cirrus' professionals are experienced in providing effective services for industrial manufacturing facilities, major and independent petroleum production and refining companies, chemical companies, commercial real estate management firms, law firms, real estate developers and investment companies, and municipalities. These clients range from Fortune 500 companies to small, privately-owned businesses.

Cirrus' experienced staff offers expertise in:

- Voluntary Cleanup Program
- Innocent Owner/Operator Program
- Industrial, Hazardous and Solid Waste
- Aquifer Characterization
- Fate and Transport Modeling
- Site Investigation Work Plan Development and Implementation
- Remediation and Field Services
- Landfill Maintenance and Monitoring Activities
- Permit Modifications
- Closure/Post Closure Plan Development
- Environmental Site Assessments
- Regulatory Consultation
- Expert Witness Testimony
- Biological Indoor Air Quality Assessment

The professionals at Cirrus keep abreast of the ever-evolving maze of environmental laws and regulations through participation in industry trade organizations and also in working groups such as the Texas Risk Reduction Program (TRRP) Guidance Document Steering Committee. This ensures that the client is getting the most up to date consulting advice in order to stay in compliance with applicable regulatory requirements.



## Section 2.0 Service Capabilities

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Cirrus' professional staff has experience in a wide range of environmental consulting service areas. Project services provided by Cirrus include planning, design, permitting, monitoring, investigation and reporting, remediation, closure and expert witness testimony. The primary service areas currently offered by Cirrus include:

- Hazardous and Solid Waste Services
- Remediation and Field Services
- Geology and Hydrogeology Services
- Real Estate Transaction Site Assessments
- Expert Witness Opinions and Testimony
- Biological Indoor Air Quality Services

Other services can be provided through teaming agreements and subcontracts with other companies. This section provides a brief discussion of Cirrus' experience in each of its primary service areas.

### 2.1 Hazardous and Solid Waste

The professionals at Cirrus have the capability of providing hazardous and solid waste services in the following areas:

- TNRCC Risk-Based Closure Plans for permitted and uncontrolled waste disposal/storage units;
- Post Closure Care Plan development and implementation;
- RCRA Facility Investigation (RFI) work plan development, implementation and reporting;
- Voluntary Cleanup Program and Innocent Owner/Operator Program related consulting;
- Expert witness testimony; and
- Oil and gas industry environmental consulting.

#### 2.1.1 Voluntary Cleanup Program

Cirrus has extensive experience working in the Voluntary Cleanup Program (VCP) and one of our project managers was instrumental in the closure of VCP Project No. 5, which dealt with heavy oil compound impacts to soil in the Woodbine Formation. We have closed or are actively working sites through the VCP that include a medical equipment manufacturing site, chlorinated organic impacts from industrial plant and dry cleaning sources, metals impacts to soil and



groundwater, asphalt production plants in two cities, a chemical storage warehouse, and hydrocarbon impacts from industrial and gasoline station sources. We have been effective in working in a cooperative manner with the VCP staff in thinking “outside the box” to arrive at site specific, creative solutions that result in winning situations for the client and the VCP.

## **2.2 Remediation and Field Services**

Services offered within the area of remediation and field services consist of:

- Remediation design, implementation and oversight for multiple remedial disciplines including plume capture, soil vapor extraction, air sparging, reactive iron walls, injectable technologies, waste stabilization and capping, as well as other approaches;
- Drum, container and waste sampling, characterization and disposal;
- Surface impoundment sampling and remediation/closure;
- Excavation, classification and disposal of contaminated soils; and
- Groundwater monitoring, statistical evaluation and reporting.

## **2.3 Geology and Hydrogeology**

Services offered within the field of geology and hydrogeology include:

- Aquifer testing, characterization and interpretation;
- Fate and transport modeling of reactive and non-reactive contaminants in saturated and unsaturated soils;
- Conceptual design of ground-water contaminant recovery systems using one-, two- and three dimensional groundwater transport models to predict potential contaminant migration pathways and receptors;
- Design, installation, development and sampling of groundwater monitoring wells, recovery wells and piezometers;
- Surface and subsurface soil investigations;
- Hydrogeologic investigations and reporting;
- Design and maintenance of soil and groundwater remediation systems utilizing multiple methodologies;
- Geophysical investigations using electrical (conductivity and resistivity), and magnetic technologies;
- Hydrocarbon/contaminant cut-off wall integrity assessment; and
- Expert witness testimony.



## 2.4 Environmental Site Assessments

Cirrus performs Environmental Site Assessments (ESAs) in accordance with the American Society for Testing and Materials (ASTM) suggested standards as described in ASTM methods E-1527 (*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*) and E-1528 (*Standard Practice for Environmental Site Assessments: Transaction Screen Process*). These ASTM methods standardize the level of inquiry utilized in performing environmental due diligence audits for real estate transfers.

The scope of work for a typical Cirrus ESA (unless modified by the client) will include:

1. Review available reports, as provided by the client, that document previous environmental investigations conducted at the subject property;
2. Review reasonably ascertainable standard historical sources to attempt to identify those uses or occupancies that are likely to have led to recognized environmental conditions. Typical historical sources that are reviewed, if reasonably ascertainable, include:
  - Aerial photographs;
  - Fire insurance maps;
  - City directories;
  - County tax records;
  - 50-year chain of title search.
3. Review reasonably ascertainable topographic, geologic and hydrogeologic information to determine the types of soil and depth of groundwater that are expected at the subject site. Locate the registered water supply wells within a one-mile radius of the site;
4. Review the following environmental record sources to identify recognized environmental conditions on the referenced property:
  - Federal NPL site list
  - Federal CERCLIS list
  - Federal RCRA TSD facilities list
  - Federal RCRA generators list
  - Federal ERNS list (property and adjoining properties only)



- State lists of hazardous waste sites identified for investigation or remediation (NPL and CERCLIS equivalents)
  - State landfill and/or solid waste disposal site lists
  - State registered leaking UST sites
  - State registered UST lists
5. Obtain and review a current USGS 7.5 minute topographic map showing the area on which the subject property is located;
  6. Conduct a single site reconnaissance investigation to collect information on recognized environmental conditions in connection with the subject property. The site reconnaissance investigation will include a site visit to visually inspect the property and any structure(s) located on the property. The status of the site on the day of the site visit will be documented through photographs of critical on-site features. A visual observation of adjacent properties will be performed for evidence of environmental concerns that might potentially impact the subject property. However, unless requested, no detailed investigations of adjacent properties will be included;
  7. Complete a Transaction Screen Questionnaire in accordance with the requirements of ASTM E-1528;
  8. Interview individual(s) who are reported to have a good knowledge of the history and physical characteristics of the subject property;
  9. Contact the following state or local agencies, as necessary, in person, by telephone, or in writing to obtain reasonably available information regarding environmental issues at the subject site:
    - The Texas Natural Resource Conservation Commission (TNRCC) to inquire as to existing permits, current or previous permit violations, enforcement actions, or citizen complaints relative to the subject property;
    - The local fire department, for available information concerning the presence of on-site flammable underground storage tanks and the fire departments' response to spills of hazardous materials on site;
    - The local water/wastewater department for information concerning existing permits, current or previous permit violations, or citizen complaints relative to the subject property;



- The local utility companies for available information concerning the presence of PCB containing or contaminated equipment on the subject property.
10. Issue a report for the site that will document the findings and opinions of impact. The report will also contain (as appendices) copies of pertinent documents regarding the site and significant photographs taken during the site visit.

## **2.5 Oil and Gas Industry**

Cirrus' experienced professionals are familiar with the latest rules and regulations promulgated by the Texas Railroad Commission (RRC) governing the storage, management, disposal and cleanup of oil field wastes. These rules provide incentives for oil and gas firms to seek the expert advice of consultants that are well versed in waste management practices and industry processes. Cirrus can provide the required level of investigation and documentation to demonstrate compliance with applicable environmental regulations. The staff of Cirrus has experience in investigating and reporting releases that have occurred to both the surface and subsurface environments to the RRC with successful results.

### **2.5.1 Pipeline Assessments**

Cirrus has experience in assisting our clients with due diligence activities related to the sale and purchase of pipelines and providing response activities to pipeline releases. In addition, we provide pipeline compliance services and archaeological assessments.

## **2.6 Biological Indoor Air Quality Services**

Cirrus provides scientifically sound, common sense consulting expertise in this largely unregulated environmental arena. Our clients utilize our services because they know they can expect to receive prompt, effective service that allows the property to be put back into productive service whether the property is residential or commercial in nature. Services offered with the field of biological indoor air quality (IAQ) include:

- Assessment of commercial and residential facilities;
- Abatement plan design;
- Abatement management services;
- Clearance inspections, testing, and reporting; and
- Industrial Hygiene and safety services.



## **Section 3.0**

### **Experience**

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The professional staff at Cirrus has experience in the field of environmental consulting which provides a strong foundation for developing effective project solutions. The following project descriptions provide examples of experience in the environmental field possessed by Cirrus' professionals. Although these represent only a few of the projects successfully completed, they provide an indication of the diversity of experience available to Cirrus' clients.



## Hazardous and Solid Waste

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- ***Three Major Petroleum Refineries, Texas:*** Prepared Part B permit amendment applications for permitted waste disposal units.
- ***Inactive Refinery, Texas:*** Prepared a Phase II Remedial Investigation Work Plan involving monitoring well installations, soil sampling and analysis plans, and a vegetation sampling and analysis plan. The work plan also included the investigation of offsite areas.
- ***Major Petroleum Refinery, Texas:*** Prepared closure construction design drawings for an inactive hazardous waste landfill area. The design analysis included (1) analysis of existing topographic relief and site constraints, (2) cut and fill analysis using in-house software, (3) design of containment berms and final cover contours. The closure design was subsequently approved by the TNRCC and was later constructed at the site.
- ***Ceramic Tile Manufacturing Company, Texas:*** Prepared and implemented work plans for the investigation of three separate uncontrolled hazardous waste disposal sites. Numerous PRPs were involved at one location, which required careful coordination between parties. The work plans included sampling and analysis procedures for surface and subsurface soils, surface impoundment sediments, and waste materials. Plans were also developed for the installation, development and sampling of numerous ground-water monitoring wells at each site. Site investigation reports were prepared for each site, providing a summary and interpretation of the results of the investigations implemented at each site.
- ***Ceramic Tile Manufacturing Company, Texas:*** Developed a risk-based closure plans for two uncontrolled waste disposal units for review by the TNRCC. A baseline risk assessment was generated as part of the closure plans. The closure plans required the design of a slurry wall and a composite final cover system consisting of a flexible membrane liner (FML) and two feet of compacted clay. Since the waste was in direct contact with a shallow water-bearing zone, waste stabilization was also implemented as part of the closure activities to minimize the opportunity for the leaching of hazardous constituents by chemically treating the waste to a level considered non-hazardous. The plans were approved by the TNRCC and were subsequently implemented.



- **Landfill Construction Company, Texas:** Performed design calculations to determine the suitability of a proposed granular leachate collection filter system for a hazardous waste landfill design. Grain size requirements were evaluated in order to prevent clogging of the filter system and piping of finer materials through the filter while maintaining the required level of hydraulic conductivity within the filter system. These calculations were performed for a three-layer granular filter as well as a geotextile filter fabric component in contact with the granular media.
- **Sugar Refining Plant, Texas:** Prepared a site investigation work plan for a former non-hazardous waste landfilling area. The investigation was directed at identifying the potential presence of contaminants in subsurface soil and groundwater associated with waste disposal practices at the site.
- **Major Petroleum Refinery, Texas:** Prepared closure plans, including engineered final cover system designs, for two wastewater treatment ponds that formerly managed hazardous refinery wastes. Design efforts were difficult due to stringent site constraints in the vicinity of the units within the refinery.
- **Wood Preserving Company, Texas:** Prepared a RCRA Facility Investigation (RFI) support document in order to satisfy the TNRCC that no additional sampling and analysis activities were necessary to delineate the extent of contamination at the site. The document was submitted to the TNRCC and was subsequently approved without modification.
- **Automobile Parts Reconditioning Company, Texas:** Prepared a Post-Closure Part B permit application for a former waste disposal area at the facility. The project included the development of (1) a report discussing local and regional geology and hydrogeology, preliminary closure plans (including engineering designs) for two waste disposal units, (2) materials specifications for construction of the final cover system for the units, and (3) a closure schedule and a cost estimate. Additional work performed included the development of a compliance plan (which required computer modeling to design an effective recovery system) for the site.
- **Chemical Manufacturing/Distribution Facility, Texas:** Developed a Post-Closure Part B permit application for an area of soils contaminated with chromic acid at the facility. In addition to developing the permit application, the closure design was reviewed and evaluated for technical merit and constructability. Based on that review, design changes were proposed to the TNRCC and were subsequently approved. Closure activities required the excavation, classification and disposal of a large volume of contaminated soils from the site, as well as the construction of a



composite final cover system. Additional project responsibilities included conducting onsite pre-bid meetings to discuss the site and answer subcontractor questions as well as evaluating subcontractor bids.

- ***Industrial Waste Management Corporation, Texas:*** Developed a risk-based closure plan for review and approval by the TNRCC for a wastewater treatment sludge disposal/treatment facility. The facility consisted of 29 engineered sludge management surface impoundments, two oxidation ponds and one engineered stormwater detention pond. Collectively, the facility occupied 234 acres and had a volumetric capacity of seven million cubic yards. A detailed risk assessment was generated as part of the plan since the facility is located adjacent to a wetlands area. The closure plan was innovative in that (1) it was developed using the regulations provided in 31 TAC Section 312 (Sludge Use, Disposal and Transportation) as opposed to the industrial solid waste regulations provided in 31 TAC Section 335 and (2) the closure plan was designed to return the facility to a natural wetlands area capable of supporting the abundant waterfowl that migrate to the area annually while protecting the health and well-being of the waterfowl species nesting there. The plan was subsequently approved by the TNRCC and was implemented by the client.
- ***Tire Manufacturing Corporation, Texas:*** Developed a risk-based feasibility/corrective measures study to provide for the closure of a series of solar evaporation ponds utilized to manage process wastewaters. The system consisted of a series of interconnected ponds occupying an area in excess of 200 acres. Various closure technologies were reviewed and evaluated for odor control capability, groundwater protection, implementability, effectiveness at treating and/or isolating the wastes, and cost of completion.
- ***Major Petroleum Refinery, Texas:*** Developed a risk-based closure plan for an inactive hazardous waste disposal facility at the refinery. The TNRCC Risk Reduction Rules were used in developing the plan. The plan consisted of a baseline risk assessment, a corrective measures study and a proposed method of closure.
- ***Bulk Fuel Terminals, Texas:*** Developed site investigation and remediation plans for multiple bulk fuels distribution facilities. Site conditions ranged from tight clays to sand units and included an old refinery at one of the bulk fuel terminals. Remediation solutions around the loading racks took into account the need to keep the racks in service.



## Remediation and Field Services

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- ***Tire Recycling Facility, Texas:*** Developed Sampling and Analysis Plan to investigate potential offsite contamination caused by a tire fire. The plan included the collection of surface and subsurface soil samples using a gridded sampling location system on the offsite property. Following the conclusion of the investigation, a remediation plan was proposed to the responsible party as well as the offsite landowner for implementation. At the conclusion of the remedial activities, expert witness services were provided on behalf of the responsible party during litigation.
- ***Major Chemical Plant, Texas:*** Developed a subsurface soil sampling and analysis plan to investigate a pipeline leak which had occurred at the plant. The product which had been released was a refined hydrocarbon containing a large percentage of benzene. The investigation plan involved field screening soil samples with an organic vapor meter and selecting specific samples for laboratory analysis to delineate the extent of contamination around the pipeline. Following the conduct of the subsurface soil investigation, a remediation plan was implemented involving the excavation, classification and disposal of a large volume of soil. The excavation activities were successful in removing all of the contaminated soil.
- ***Chromium Impacted Vacant Tract:*** Assisted a client in evaluation of chromium impacts to the soil and groundwater on their property from an adjacent source. Through a thorough examination of the file and limited sampling was able to re-focus the responsible party's efforts to address issues not formerly part of their response action.
- ***Major Petroleum Refinery, Texas:*** Developed a sampling and analysis plan to investigate a release that occurred within a series of pipelines that traversed a field adjacent to the plant. The plan involved collecting a series of subsurface soil samples for analysis of target compounds to identify the pipeline responsible for the release (i.e., the responsible party).
- ***Major Petroleum Refinery, Texas:*** Conducted large-scale subsurface soil sampling event at a land treatment unit used for the disposal of selected refinery wastes. Utilized special coring devices to retrieve representative soil samples from the land treatment unit zone soils to demonstrate compliance with applicable regulations that required the wastes to be treated within the upper five feet of soil.



- **Wood Treating Facility, Texas:** Provided quarterly ground-water sampling services to a closed facility in east Texas. Generated quarterly and annual ground-water sampling reports for submittal to the TNRCC.
- **Metal Plating Company, Texas:** Provided monthly effluent sampling services for stormwater discharges from a manufacturing facility. Generated reports for submittal to the TNRCC demonstrating compliance with permit requirements.
- **Ceramic Tile Manufacturing Company, Texas:** Performed a ground-water quality assessment to evaluate the impacts of a leaking UST to the shallow soils and ground water at the site. The assessment involved the installation and sampling of ground-water monitoring wells as well as the collection of soil samples for analysis of selected parameters. Aquifer tests (slug tests) were performed at three of the monitor wells to evaluate the fluid transmitting properties of the shallow water-bearing zone. The data gathered from this investigation was utilized to execute a computer modeling simulation of the potential offsite migration of the contaminant plume. This information was incorporated into a Risk Based Closure Plan for the USTs, which was submitted to the TNRCC for review and was later approved.
- **Major Petroleum Refinery, Texas:** Developed a closure plan for two USTs that were being taken out of service. The plan was developed at the request of the TNRCC to elaborate on the rationale for not conducting additional sampling or remediation activities in conjunction with the UST closures. The plan included health and safety protocol as well as engineering design for evacuating, cutting open, decontaminating and backfilling the excavated USTs. The plan was subsequently approved by the TNRCC and was later implemented.
- **Former Research Center, Texas:** Investigated and developed a remediation plan to address PCE impacts in the shallow clay and perched groundwater. The remediation consisting of excavation followed by limited injection of remedial fluids reduced contaminant levels by 90%.
- **Asphalt Production Plant, Texas:** Investigated the site for environmental impacts, based on the results of a Phase I Environmental Site Assessment that was conducted as part of a property transaction. The site was entered into the VCP and soil and groundwater impacts were addressed during remediation activities. The site later received a Certificate of Completion from the VCP, and the property transaction went through.



## Geology and Hydrogeology

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- **Naval Air Station, Texas:** Performed a subsurface geophysical survey using a conductivity instrument (Geonics EM-31) to delineate the boundaries of former landfills at seven different suspected sites at the facility. This information was utilized to develop a report for investigating these sites to prevent impact to the shallow unsaturated zone soils and shallow groundwater at the site.
- **Ceramic Tile Manufacturing Company, Texas:** Implemented site investigations at three hazardous waste disposal sites. These investigations included (1) drilling, logging and sampling numerous soil borings at each site and installing numerous groundwater monitoring wells, (2) collection of surface and subsurface soil samples, surface impoundment samples (fluid and sediment), and (3) preparation of site investigation reports based on the results of the investigations.
- **Major Petroleum Refinery, Texas:** Developed an investigation work plan for the evaluation of the hydraulic gradient, geotechnical and fluid transmitting properties of the uppermost aquifer in the vicinity of two regulated surface impoundments.
- **Metal Plating Company, Texas:** Prepared a groundwater investigation work plan to evaluate the quality of the water within the uppermost water-bearing zone at the site. The results were used to evaluate whether or not waste management practices at the facility had impacted the shallow groundwater at the site.
- **Greenhouse, Texas:** Provided expert witness testimony in a federal trial regarding offsite contamination that had affected the groundwater supply at a greenhouse facility in west Texas. The uppermost aquifer (Ogallala Aquifer) had been contaminated with chlorinated solvents. The project required the preparation of an extensive experts report, several follow-up letters of rebuttal to opposing experts' opinions, deposition, and testimony in federal court.
- **Contract Analytical Laboratory, Texas:** Provided expert witness services for groundwater contamination that emanated from an offsite location and migrated onto adjacent property. The uppermost aquifer had been contaminated by chlorinated solvents from industrial operations. The project required the generation of a letter stating the expert opinion of the geologist, and deposition regarding the same.



- ***Ceramic Manufacturing Company, Texas:*** Provided expert witness testimony regarding offsite contamination resulting from the uncontrolled disposal of hazardous wastes. The project required the generation of numerous reports and a deposition.
- ***Paper Mill, Texas:*** Developed and implemented a ground-water quality assessment plan to evaluate the potential for contamination of the uppermost water-bearing zone from numerous waste disposal unit at the plant. The project required negotiations with the TNRCC and numerous letters and reports. The plan was approved and later implemented and quarterly monitoring was conducted.
- ***Large High Tech Firm, Texas:*** Conducted a computer modeling analysis of the potential migration pathway of an existing plume of tetrahydrofuran as part of a risk assessment for remediation of the site.
- ***Hat Manufacturing Company, Texas:*** Developed a ground-water quality assessment report and sampling and analysis plan for a processing facility having soil and ground-water contaminated with perchloroethylene. The document was developed to demonstrate to the TNRCC that sufficient information had been collected at the site to serve the purposes of a ground-water quality assessment and that no further investigation was necessary.
- ***Major Petroleum Refinery, Texas:*** Prepared a hydrogeologic evaluation work plan as part of an investigation plan for the remediation of an existing ground-water contaminant plume caused by previous waste management practices at the facility.
- ***Oil Field Service Company, Texas:*** Conducted a hydrogeologic assessment of the property to evaluate the extent of contamination of the uppermost water-bearing zone caused by releases from an underground storage tank. Activities included (1) conducting a plume delineation investigation by advancing numerous soil borings throughout the site and collecting ground-water samples from each one, (2) conducting a step-drawdown pumping test to evaluate optimal pumping rates to be utilized during an aquifer pumping test to determine the fluid transmitting properties of the aquifer for purposes of performing computer modeling to design an effective recovery system, and (3) developing a comprehensive report discussing the results of these activities. Based on the results of these activities, a ground-water recovery system was designed, installed and put into operation at the site using computer modeling as a design tool.



- **Major Petroleum Refinery, Texas:** Conducted computer modeling studies to predict the potential offsite migration paths of an existing benzene plume in the uppermost water-bearing zone. This was accomplished utilizing the USGS Method of Characteristics (MOC) model in order to determine the most strategic and efficient recovery well locations that would prevent the potential offsite migration of the benzene plume.
- **Major Petroleum Refinery, Texas:** Conducted a computer modeling analysis utilizing a computer model known as PLUME3D.BAS, which was developed by the International Ground Water Modeling Center at Butler University (Indianapolis, Indiana). A three-dimensional model was utilized since the aquifer was stratified with respect to hydraulic conductivity. The upper portion of the aquifer was composed of a fine sand and the lower portion of the aquifer was composed of a highly permeable gravel layer. Based on the results of the computer modeling analysis, several monitor well locations were proposed to the TNRCC. The locations were approved and the client was released from having to install and sample additional wells as initially requested by the TNRCC.
- **Major Petroleum Refinery, Texas:** Conducted an unsaturated zone computer modeling analysis to evaluate potential impacts to shallow ground-water quality caused by the operation of a refinery landfarming facility. Evaluated loading rates, chemical properties, soil properties and adsorption coefficients to utilize in the one-dimensional Steady-state Advection Model (SAM). The SAM model was used to determine the concentration(s) of organic compounds that might potentially migrate downward through the vadose zone and impact the shallow ground water. The SAM model provided a quick, conservative description of the movement and concentration of hazardous constituents within the landfarm treatment zone (LTZ) soils. Using this methodology, it was possible to illustrate to the TNRCC that ground-water contamination in the area was from a source other than the landfarm.
- **Ceramic Tile Manufacturing Company, Texas:** Performed a ground-water quality assessment at a manufacturing facility. The assessment was performed to evaluate the impacts of leaking underground petroleum storage tanks (USTs) to the shallow soils and ground water. The assessment involved the installation and sampling of ground-water monitoring wells as well as the collection of soil samples for analysis of selected parameters. Aquifer tests (slug tests) were also performed at three of the monitor wells to evaluate the fluid transmitting properties of the shallow aquifer. The data gathered from this investigation was utilized to execute a computer modeling simulation of the potential offsite migration of the contaminant plume. The USGS



MOC model and a reactive solute transport module were utilized in this simulation to incorporate effects of chemical half-life, biodegradation and chemical adsorption into the modeling effort. This information was incorporated into a Risk Based Closure Plan for the USTs, which was submitted to the TNRCC for review and was later approved.

- ***Sand and Gravel Dredging and Mining Operation, Texas:*** Conducted a subsurface investigation to provide an estimate of in-situ reserves. Based on the economic feasibility of extracting the available reserves, Cirrus assisted the client in obtaining the necessary permits from the Corps of Engineers, Texas Parks and Wildlife Department, and the TNRCC. Cirrus also assisted in discussions with local municipal authorities in obtaining their approval for the mining operations to gain approval. A wetlands survey, a gradient-boundary survey and river channel mapping and cross-section development were all required as part of this project.



## Regulatory Consulting Services

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- **Major Railroad Company, Texas:** Conducted a pre-acquisition Phase II Environmental Site Assessment (ESA) on a parcel of land that was being purchased. Due to its rural location, the land had been illegally accessed by unknown parties for dumping of a variety of refuse. The concern was that hazardous materials may have been illegally disposed on the surface or subsurface of the property. The ESA involved a site reconnaissance and mapping effort as well as a subsurface geophysical survey utilizing a conductivity instrument to locate potential waste burial areas. Following the geophysical survey, areas suspected of waste disposal activities were excavated and sampled for laboratory analysis of hazardous constituents identified on the EPA priority pollutant list. A thorough report, based on the results of the investigation, was prepared and submitted to the client.
- **Chemical Distribution Company, Texas:** Conducted a pre-acquisition Phase II ESA at a chemical solvent bulk storage and distribution facility. The concern was that chlorinated organic solvents had been spilled in areas of the facility, which might expose the purchaser to civil action by adjacent landowners. The ESA involved the collection and analysis of a series of surface and subsurface soil samples in order to evaluate whether or not soil and/or ground-water contamination had occurred. Geologic cross-sections were also constructed for the facility, based on drilling results.
- **Public Golf Course, Texas:** Conducted a pre-acquisition Phase II ESA at a golf course to investigate potential soil and ground-water contamination caused by a leaking UST at a gas station adjacent to the property. The ESA involved reviewing all available data obtained from previous investigations at the gas station and conducting additional investigative activities as needed. Based on the results of the investigation, the responsible parties were required to remediate the land contaminated by releases from their gas station.
- **Ceramic Tile Manufacturing Company, Texas:** Conducted a modified pre-acquisition Phase I ESA for a parcel of land selected by the tile manufacturing firm as a candidate site for the construction of a new tile manufacturing facility. In addition to the specifications outlined in ASTM 1527 and ASTM 1528 for the conduct of a pre-acquisition ESA, geotechnical testing was conducted in order to evaluate the suitability of the site soils for the construction of a large manufacturing facility. Several soil borings were also drilled in order to evaluate shallow geology and hydrogeology. A limited amount of sampling was conducted to evaluate suspect



conditions at the site such as asbestos containing materials (ACM) and soil contamination by metals and organic constituents.

- ***Oil Field Drilling Company, Texas:*** Performed a pre-acquisition Phase I and Phase II ESA on property that was being acquired in a buy-out of an oil-field drilling services company. Performed a site reconnaissance and background search in accordance with ASTM standards to evaluate potential areas of concern at the facility. Based on the findings of the site reconnaissance and background search, soil testing was recommended and numerous areas of contamination were identified. Through this effort, numerous operational changes and remedial activities were proposed for the site. This potentially saved the drilling company from civil actions and long-term environmental liabilities.
- ***Land Developer, Texas:*** A Phase I and Phase II ESA was conducted for property being evaluated for development into residential subdivisions. A portion of the property was adjacent to a superfund site contaminated with radioactive materials. The property was investigated for the presence of cesium in surface and subsurface soils as well as groundwater. The property was found not to be contaminated with cesium and negotiations were initiated with the local city governments and the EPA to resolve the issue of the radioactive wastes on the adjacent property.
- ***Petroleum Refining Company, Puerto Rico:*** Performed pre-acquisition due diligence review of the environmental liabilities associated with a petroleum refinery in Puerto Rico. Reviewed the environmental files of the refinery and evaluated areas where they were/were not in compliance with applicable regulations regarding subsurface contamination both on the refinery and at remote retail centers. Prepared a report for the investors outlining areas requiring attention and discussing measures that would be required to bring the facilities into compliance.
- ***Business Supply Warehouse, Texas:*** A business products warehouse formerly utilized an outdoors storage building for storing drums of solvent. Over the years, there were releases to the surface soils from the stored chemicals. Following the implementation of several field investigations and remedial activities, the site was entered into the Voluntary Cleanup Program (VCP) of the TNRCC as part of a real estate transaction for a New York City based investment firm. The transaction was hinged on demonstrating compliance with Risk Reduction Standard No. 2 residential cleanup criteria, which negates the need for deed restrictions on the future use of the property. Investigation and reporting timeframes were expedited through close coordination with the VCP project manager and the purchasers' independent consultant. This resulted in meeting the purchasers' deadline for the property



transaction. A certificate of completion was issued by the VCP for the property being evaluated.

- ***Asphalt Manufacturing Plant, Texas:*** Following the conduct of several phases of investigation by other consulting firms, the asphalt plant was entered into the VCP for purposes of a real estate transaction. The closing of the deal was contingent upon receiving a certificate of completion from the VCP for the entire property. Contaminated media at the site included surface and subsurface soils and ground water. The primary contaminant at the site was total petroleum hydrocarbons (TPH) associated with the production processes at the facility. Other contaminants encountered at the site were associated with metals in dredge spoils, polychlorinated biphenyl's (PCBs) near power transformers, and a limited number of volatile and semivolatile organic constituents associated with a former UST and pump. Other consulting firms had estimated that bringing the property into compliance with risk-based standards for industrial facilities would cost in excess of one-million dollars. A risk-based approach was utilized to demonstrate compliance with the industrial standards with a minimal amount of soil remediation and no ground-water remediation. The site received a certificate of completion without implementing time consuming and expensive remediation technologies as proposed by other consulting firms. The project objectives were achieved with only a fraction of the costs estimated by other firms.
- ***Powdered Metals Manufacturing Facility, Texas:*** A powdered metals manufacturing facility was entered into the VCP as part of a real estate transaction. A Phase II ESA conducted by another consulting firm identified metals and TPH contamination in several areas of the site. The other consulting firm recommended that the property not be purchased due to the contamination. After reviewing the data obtained by the other consulting firm, it was determined that a risk-based approach would be capable of getting the property through the VCP and a certificate of completion would be issued indemnifying future purchasers and lenders from liabilities associated with the contamination identified on the property. An investigation work plan was generated and submitted to the VCP for review. A preliminary meeting was held with the VCP to ensure that all were in agreement with the scope of work proposed for the site. The work plan was implemented and a Site Investigation Report was developed based on the findings of the investigation. As a result of the sampling and analysis, four areas were immediately removed from further action and only three areas required additional investigation and remediation to demonstrate compliance with industrial cleanup criteria. This approach resulted in positive results with the sale of the property to another purchaser.



- ***Real Estate Investment Company, Texas:*** A commercial/industrial property located in Houston, Texas was admitted into the VCP as part of a real estate transaction between two real estate investment companies that were located in Redmond, Washington and Houston, Texas. A Phase I / limited Phase II ESA identified several areas of potential environmental concern. Cirrus prepared the VCP Application, VCP Agreement and Site Investigation Work Plan for admission of the property into the VCP. The work plan was subsequently approved and implemented. An additional work plan was prepared to further investigate an area formerly occupied by a UST, based on the findings of the initial investigation. The supplemental work plan was approved and implemented to successfully delineate contaminated soils in the area. The contaminated soils were subsequently excavated and disposed. The excavation pit was backfilled with clean fill and compacted. A Certificate of Completion acknowledging compliance with risk standard number 2 of the Texas Risk Reduction Rules was granted to the property owners based on the work provided by Cirrus.



## **Biological Indoor Air Quality Services**

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Cirrus has conducted over 250 biological indoor air quality investigations/assessments, abatement plan designs, and clearance investigations for clients ranging from insurance companies to commercial property owners. Facility types have ranged from single family dwellings to multi-unit commercial facilities.

During an investigation/assessment a visual inspection of the property is conducted, residents/tenants are interviewed to gather historical and health related information, and photos are taken to document suspected concerns. Investigations/assessments typically involve collecting particulate and culture plate air samples from inside and outside the structure being evaluated. Additional samples (bulk materials, tape samples, swab samples, etc.) are collected from known or suspected problem areas to document the presence or absence of airborne allergens.

Cirrus will design an abatement plan for those properties requiring abatement. The abatement plan will outline the scope of the remediation following industry accepted practices.

Following abatement, Cirrus will conduct clearance sampling to ensure that the abatement measures were successful in addressing IAQ concerns.

Our goal is to provide common sense, cost effective solutions to address our clients' IAQ concerns.



## Section 4.0

# Project Management Philosophy

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Today's environmental consulting industry is a competitive market where client focus is of paramount importance. Cirrus believes that the concern for client focus shared by the management will pay dividends in client loyalty. The success of a firm is not merely centered on the particular level of technical expertise offered by that consulting firm, but effective service must ensure that the clients' best interest is always the centerpiece of the strategic approach selected for achieving project objectives. We never prescribe to the "cookie cutter" approach and look at each client and each set of issues independently. By adhering to this ideology, and embracing the difficulties faced by the client, a strong bond is formed with industry and repeat business results.

Cirrus' approach to environmental consulting is straightforward and effective. On every project, the assigned Project Manager appoints experienced professionals to efficiently achieve the project objectives. The Project Manager interfaces with each client to determine the scope, schedule, and budget of the project. Quality, time, costs and client objectives are the parameters that the Project Manager uses for successful planning and implementation of the project. The Project Manager is experienced in the specific issues the client is facing and has great latitude in the best manner for Cirrus to meet the client's needs.

The Project Manager assures that all work processes conform to established quality standards, directs the staff and monitors performance throughout the project. Regular project status reports are provided to the client as the project size dictates. This information helps clients understand their options and to foresee the potential short-term and long-term implications of their decisions. In addition to reporting directly to the client, the Project Manager negotiates, when necessary, with regulatory agencies on behalf of the client.