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White Shield, Inc. is a professional services consulting firm established in 1978, and is active in providing Geotechnical & Environmental Engineering, Geographical Information Systems (GIS), Hazardous Materials Assessments, and Environmental Consulting to a diverse client base of government and commercial interests. The company is a Native American-owned, Small Disadvantaged Business, and MBE/DBE certified in WA, OR, ID, ND, and MT.

White Shield provides a wide range of professional services in support of the design and construction of various projects in the natural and built environment throughout the Pacific Northwest region. Our experience includes an extensive variety of engineering related services that have been provided to Federal, State, and Local Agency governments, Tribal organizations, the banking and insurance industry, utility and communications industries, schools, colleges and universities, port districts and municipalities.

White Shield supports some of the largest and most complex projects in the Pacific Northwest. We have provided services in support of Department of Energy projects at Hanford, Department of Transportation bridges and highways, and Department of Defense Chemical Demilitarization. Our Professional Engineers are registered in multiple states so that we can service our Federal clients across a large geographic range. Our services include the following:

**ENVIRONMENTAL SERVICES**

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<tr>
<th>Service</th>
<th>BLSAs</th>
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<tr>
<td>Asbestos Surveys</td>
<td>Health &amp; Safety Plans</td>
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<td>Feasibility Studies</td>
<td>Industrial Hygiene</td>
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<td>Geographical Information (GIS)</td>
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<td>Monitoring &amp; Sampling</td>
<td>Lead-based Paint Surveys</td>
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<td>Hazardous Material Surveys</td>
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**ENGINEERING SERVICES**

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<td>Geohazard Assessment</td>
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<td>Seismic Refraction Survey</td>
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**OUR CLIENTS**

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<td>Indian Health Service</td>
<td>US Army Corps of Engineers</td>
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<td>US Navy (NAVFAC)</td>
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**Licenses and Codes:**

- WA: Engineering Corp #369
- WA UBI: 600 272 279
- DUNS: 09-724-2234
- CAGE Code: 0DKT6
- Federal Tax I.D.: 91-1019180

**NAICS Codes:**

- 541330, 541340, 541360, 541370, 541620, 541990, 562910, 237310.

**Website:**

[www.whiteshield.com](http://www.whiteshield.com)
SECTION 2
GEOTECHNICAL ENGINEERING SERVICES
White Shield Inc has been providing quality engineering services throughout the rural, forested, and metropolitan areas of the Pacific Northwest for over 40 years. Our geotechnical engineers are actively supporting our client’s development goals whether the project is a government installation, commercial development, industrial site, residential structure, or a recreational facility. Our professionals assist our clients with environmental and natural resource issues to bring them in compliance with local, state, and federal regulations. We believe that these issues can be managed in a cost-effective and timely manner to the complete satisfaction of all stakeholders. Typical clients include site developers, tribal governments, school districts, federal state, and local municipalities, home owners, petroleum, and food products industries. Our engineering services include planning, design, permitting, environmental compliance, and construction phase services. Our engineering staff provides the following services:

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<th>Geotechnical &amp; Soils Investigation</th>
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White Shield’s engineering staff has the knowledge and experience to handle the technical challenges associated with civil, geotechnical and environmental engineering requirements for a variety of developments or site improvements. Their individual areas of expertise are outlined in the following table.

<table>
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<tr>
<th>KEY PERSONNEL</th>
<th>Years of Experience</th>
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<th>Storm Water Systems</th>
<th>Stream Bank Stabilization</th>
<th>Roads and Bridge Foundation</th>
<th>Horizontal &amp; Vertical Boring</th>
<th>Parking Lots &amp; Pavements</th>
<th>Storm Water Systems</th>
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<td>Michael Black, PE, Geotechnical, Civil, Environmental Engineering</td>
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Geotechnical Investigation for the Proposed Washington State Penitentiary Building; KMB Architects for Washington State Department of Corrections.

White Shield conducted a geotechnical investigation for a 20,000 SF Washington State Penitentiary (WSP), New Program and Support Services Building. The investigation included constructing 4 geotechnical borings, 3 each earth probe borings, soil classification, soil testing, and measurement of groundwater elevations. Our design recommendations include the allowable soil bearing pressures, cut and fill recommendations, sub-grade preparation, and seismic design information along with a site grading plan.

Warm Springs Sunnyside Lagoon Study, Warm Springs, Oregon; Indian Health Service

White Shield conducted a geotechnical investigation for a sewer lagoon system serving the Sunnyside community on the Warm Springs Indian Reservation. The Indian Health service is assessing the existing two lagoons and planning for expansion with a third lagoon. We planned on performing three soil bores to 50’ depth at 2-inch diameter and constructed a piezometer to determine groundwater depth. Constant core was extracted at 10’ intervals and logged per ASTM D2488 and D5434, and sent to laboratory for analysis and classification per ASTM D2487-11. A report was prepared that includes the borehole logs, laboratory analysis, hydraulic conductivity, estimated static water levels, and a determination of groundwater gradients and flow direction.

Moore Emergency Shoreline Erosion Along Naches River, Naches, WA; Mark and Lilly Moore

In this project, the Naches River seriously threatened the home of Mark and Lilly Moore due to continued bank erosion. White Shield provided a sufficient evaluation, design, report, drawing, and preparation of the regulatory forms to mitigate continued bank erosion, and at the same time keeping the costs low for the client. In the investigation process, interviews were conducted with the client and a government official to obtain historical information of the property. It was found that native soils rested below a manmade fill. This information, as well as other information obtained by surveying various aspects of the property, such as river behavior and the stream velocity at the home, led to the conclusion that a boulder structure bank protection system, consisting of very large boulders placed in spaced trenches some 25 ft on-center, would provide the mass to mitigate continued bank erosion. It was also recommended that a boulder riprap at least 2ft on a side and live bundled branches and limbs between the boulder structures would provide the most cost effective and environmentally effective means for protecting the property from erosion.
Kenyon Zero Storage Geotechnical and Surveying, Pasco, WA; Kenyon Zero Storage

Kenyon Zero Storage planned a new freezer storage project on Port of Pasco land on Industrial Way, Pasco Processing Center. The freezer measures approximately 250,000 square feet on 16.6 acres of land. WSI’s role in the project consisted of topographic surveys and geotechnical/soils engineering for initial site planning purposes. Although not the largest of Kenyon Zero Storages, this facility utilizes newer technology than the other facilities including a fully LED lighting system, as well as increased R-value walls and roof, in addition to a new flooring system. The entire floor is three feet thick, the bottom layer being six inches of sand with a glycol system consisting of flexible tubing spaced every 18 inches across the entire floor in the three football-field size rooms. That’s topped with a vapor barrier, six inches of insulation, 15 inches of ballast rock, three inches of finely crushed rock and finally, six inches of concrete. This way, if there is a power loss, as long as the door to the facility remains shut, the whole football-field-sized room will remain cold for several days, until power can be restored.

Bleyhl Farm Service, Commercial and Retail Warehouse Store, Pasco, WA; Bleyhl Farm Service

White Shield developed a Geotechnical Investigation Report for the construction of Bleyhl Farm Service facility in Pasco, Washington (site). The site is a three-acre lot located on Chapel Hill Boulevard about 450 feet east of Road 68. The buildings will be a one-story, slab-on-grade, steel structures with thickened slab concrete spread footings. Our geotechnical investigation of this site includes a review of the site geology, a description and assessment of site soils and subsurface profile, and geotechnical recommendations and specifications for construction of the retail/warehouse facility. Subsurface investigations were preformed using test pits to examine soil conditions and collection of samples. Water infiltrations tests to determine rates for storm water design. Seismic refraction surveys were used to determine the subsurface seismic velocity profile below the array including the depths of the subsurface layers.

Allied Potato Processing Plant and Office Geotechnical Investigation, Allied Potato Northwest

White Shield developed a Geotechnical Investigation Report for the construction of a 55,000 sf plant and office facility in Pasco, Washington. The site is located on Glade Road North in Pasco, WA. The buildings will be a two-story office, and a processing plant that is a slab-on-grade, steel structure with thickened slab concrete spread footings. Our geotechnical investigation of this site includes a review of the site geology, a description and assessment of site soils and subsurface profile, and geotechnical recommendations and specifications for construction of the retail/warehouse facility. Subsurface investigations were preformed using test pits to examine soil conditions and collection of samples. Water infiltrations tests to determine rates for storm water system and infiltration pond design. Seismic refraction surveys were used to determine the subsurface seismic velocity profile below the array including the depths of the subsurface layers. Due to conditions of fine dune sand, structural fill is required for all load bearing structures such as sidewalks, buildings, and asphalt.
Warm Springs Water System Engineering Investigation, Warm Springs, OR; Century West Engineering for Indian Health Service

A section of water main on the Warm Springs Community Water that provides a critical connection across the Shitike Creek failed catastrophically. A subsurface investigation for construction of a new pipeline crossing under the Shitike Creek was conducted. Tasks to be performed include three borings and two test pits and performing laboratory analysis on soil samples. Soil profiles were field characterized and logged. Testing included soil classification (gradation and plasticity), dry density, moisture content, moisture density relationships, consolidation, pH, electrical resistivity, soluble sulfates and chlorides, and shear strength. Findings, laboratory data and recommendations summarized in a report with description of engineering properties related to horizontal boring for a new water main.

Quinault Indian Reservation WWTP Geotechnical Study, Queets WA; Century West Engineering for Indian Health Service

White Shield performed a geotechnical analysis for the proposed site for a waste water treatment plant and lift station to serve the community of Queets, Washington. The subsurface investigation required soil borings to document soil properties, groundwater elevation, and collection of samples. Tasks to be performed included four borings at 30 to 35 feet below ground surface and performing laboratory analysis on soil samples. Findings, laboratory data and recommendations were provided in a report that summarizes the information found during field exploration, presents the results of laboratory testing, and provides recommendations for design and construction of the proposed WWTP.

Geotechnical Investigation for City of Pasco Fire Station Number 83 and 84; TCA Architects for the City of Pasco.

White Shield performed a geotechnical investigation and stormwater infiltration testing for the design and construction for two fire stations (number 83 and 84) located in the City of Pasco. The report includes a review of site geology, site soils, seismic evaluation, and a subsurface profile with geotechnical recommendations and specifications for site grading and construction of foundations consistent with International Building Code requirements. Geotechnical design recommendations included criteria for foundation configuration, site preparation, earthwork (excavations, cut and fill slopes, site grading, structural fill), foundation design (settlement, backfill, walls and lateral earth pressure, seismic design), slap on grade design, and pavement design. Stormwater infiltration tests were performed to support engineering analysis for stormwater systems design for onsite containment systems to meet Stormwater Management Design Requirements.
White Shield has performed geotechnical investigations and retaining wall designs for numerous retaining walls for homeowners, housing developers, and landscape contractors. Retaining walls may appear to be simple structures but an inspection of most retaining walls will reveal cracks, bulges, leaning, and blowouts. Retaining walls of poor structural design aren't able to hold back the load behind it or they have poor drainage. Most city codes now require engineered walls for any walls four feet or greater in height. White Shield engineers perform geotechnical investigation and design to meet code requirements beginning with determining the soils suitability for a retaining wall. Given the nature of the soil, we will recommend excavation of unsuitable material to a firm base and prepare site plans and cross-section drawings for the new wall. Many walls are designed with a poured contract foundation or gravel base. The brick or blocks are placed on top of this foundation in configuration that creates an offset that leans into the hillside and secured with a “deadman”. Brick and block walls are cement and mortar type or stacked concrete blocks. Block and brick walls are also designed with a drainage system so that water may flow past or through the wall, so as to not undermine the structure. Wall designs can be made from rock boulders (commonly basalt rock in the Pacific Northwest), Ultrablock that range in sizes of 4’ x 6’, and segmented landscape brick walls. There are many types of block that are highly decorative that can be chosen to fit your landscape design. The final design and construction must allow support of the lawn, home, garage, or swimming pool that creates a lateral load on the wall. The engineered wall provides a safe and secure environment for many years for the home owners and surrounding community.
Section 3
ENVIRONMENTAL SERVICES
ENVIRONMENTAL SERVICES
White Shield has been providing quality environmental services since 1978 throughout the various regions and major metropolitan areas of the Pacific Northwest. With offices strategically located in western and eastern Washington, we are able to serve the region effectively with our full range of environmental services. We have worked in the high desert plateaus, the Cascade Mountains, the Puget Sound area, the Olympic Peninsula, and the river valleys of eastern Washington and Oregon. Additionally, we have worked in major industrial sites at Hanford, the Puget Sound area, Superfund sites, and military bases throughout Washington State. Our services have also carried into the Idaho Rockies, eastern Montana, and northern California.

Our environmental program is staffed by environmental, geological, industrial hygiene, and industrial health and safety experts who have been helping our clients comply with the myriad of local, state, and federal regulations, as well as assisting with their environmental and natural resource issues. We believe that these issues can be managed in a cost-effective and timely manner to the complete satisfaction of all stakeholders. We provide a wide range of environmental services to both the public and private sector. Our typical clients include site developers, tribal governments, federal state, and local agencies and municipalities, as well as banking, insurance, petroleum, and food products industries. Some of our environmental services include:

### Environmental Investigations, Remediation, and Management
- Phase I and II Environmental Site Assessments
- Brownfield Investigations
- Groundwater Well Installation
- Groundwater Monitoring and Sampling
- Remedial Investigations & Feasibility Studies
- Remediation Conceptual Design
- Remediation Management and Oversight
- NEPA/SEPA Compliance

### Environmental Compliance
- MTCA Compliance
- Permit Support
- SPCC Plans
- Erosion and Sediment Control Plans
- Environmental Monitoring
- CERCLA / RCRA Compliance
- Litigation Support

### Hazardous Materials & Waste
- Hazardous Materials Inventory
- Asbestos Surveys (AHERA)
- Lead Based Paint Surveys
- Underground Storage Tank Investigations
- Emergency Spill Response
- Waste Shipment and Manifesting

### Environmental Health and Safety
- Health and Safety Plans
- Regulatory Compliance (OSHA)
- Job Hazard Analysis
- Industrial Hygiene Monitoring
- Hazard Mitigation
- Hazardous Materials Management
Environmental Project Managers

Our environmental project managers are highly technically qualified and are able to manage a wide variety of environmental, health and safety projects to meet the client’s needs. They are seasoned professionals with the credentials and professional registrations that reflect their expertise in their field, and are assigned projects that reflect their individual experience. White Shield has the resources to provide all types of environmental project services, from Phase I Environmental Site Assessments to complex remedial investigation/feasibility studies. Project managers are responsible for quality assurance on their individual projects, and for following White Shield’s Quality Assurance Plan throughout all phases of the project. Review of all work is performed by experienced professionals or under their direct supervision.

White Shield’s key environmental personnel have the knowledge and experience to handle the technical challenges associated with environmental engineering, and environmental health and safety services. Our key environmental staff is composed of a variety of disciplines, including environmental engineers, hydrologists, geologists, hazardous waste specialists, and industrial hygienists. Their individual areas of expertise are outlined in the following table.

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<td>Michael Black, PE, Geotechnical Environmental Engineering</td>
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Licensing and Certifications

White Shield has state licensed engineers, geologists, and hydrogeologists in supervisor positions for all projects. Our personnel are licensed in the States of Washington, Oregon, Idaho, and North Dakota. White Shield also maintains environmental, hazardous waste, and health and safety certifications for its environmental staff through education and testing. We invest in each of our employees to keep abreast with new technologies and changing regulations as it pertains to our work associated with hazardous waste, asbestos, lead-based paint, and underground storage tanks. The following is a list of certifications we maintain for our environmental staff:

- Washington State Professional Engineer specializing in Geotechnical & Civil
- Washington State Professional Geologist/Hydrogeologist
- Oregon State Professional Geologist
- Certified Engineering Geologist, Oregon, Washington, and Idaho
- AHERA Certified Asbestos Inspector
- Certified Lead-based Paint Risk Assessor
- Certified Lead-based Paint Inspector
- 40-hour HAZWOPER Health & Safety Training
- 8-hour HAZWOPER Health & Safety Refresher
- Washington State UST Site Assessor/Supervisor
Asbestos Abatement Projects

Bureau of Indian Affairs Residential Asbestos Abatement Project, Shivwits Indian Reservation, Shivwits, Utah; Bureau of Indian Affairs.

White Shield, Inc. acted as Contractor to the Bureau of Indian Affairs, and the Southern Paiute Agency on this $100,000+ contract. Responsibilities included preparation of a Work Plan, a Quality Control Plan (QCP), a Quality Assurance Surveillance Plan (QASP), and a Health and Safety Plan (HASP); and identifying a local asbestos abatement contractor to complete the work. White Shield oversaw project work which consisted of removing asbestos-containing materials (ACM) from two residences and three mobile homes, demolition and disposal of the three mobile homes, restoration of abated surfaces in the two residences, and installing three new mobile homes. At an on-site kick-off meeting, it became evident apparent that substantial services in addition to the initial scope of work would be required. White Shield worked closely with BIA to amend the project budget to reflect the added work. White Shield worked closely with the abatement contractor, making two trips to the project site to inspect the abatement contractor’s work, to ensure that the work was conducted in a safe and orderly manner, and to document various aspects of the project.


This project involved the demolition and removal of a USFS compound building #2002. The building is a 2-story wood frame building built in 1960. The building rests on a formed concrete foundation. The building has 9” x 9” asbestos containing tiles that required abatement on both floors. The project required removal of lighting, ballasts, window air conditioner, furniture, appliance, carpet, and cabinets. An underground heating oil tank (UHOT) was removed as part of the demolition. After removal of the UHOT, the soil was tested and found to contain petroleum contamination from leaks or overfilling. A UHOT removal report and assessment was conducted and documentation sent to the Oregon DEQ and the USFS.

Asbestos Abatement Air Quality Monitoring, Richland Federal Building, Richland, WA; General Services Administration.

White Shield supported the General Services Administration with air monitoring services at the Richland, WA Federal Building during contractor removal of asbestos containing materials. The work was performed after normal business hours when the building is un-occupied. Pre-abatement air sampling and an initial inspection of the containment installed by the abatement contractor were conducted to ensure compliance with Federal and State regulations. During the abatement, White Shield provided twice-weekly air monitoring at three locations outside of the containment, and a visual inspection inside the containment weekly. Air sample analysis was conducted by the Phase Contrast Microscopy (PCM) method. When the abatement concluded, White Shield provided a final visual inspection, aggressive air sampling, and Transmission Electron Microscopy (TEM) air sample analysis before removal of the containment by the abatement contractor.


The Baker compound buildings required removal of 224 SF of asbestos materials in sheet vinyl. The Riggins compound has 576 SF of asbestos materials in sheet vinyl. The materials were removed by team of 4 abatement workers in one day for each site. Waste was properly disposed at Oregon and Idaho DEQ facilities.
Asbestos Risk Assessment

Surveys


White Shield performed a hazardous materials assessment for nine buildings at the Washington State Penitentiary that will be demolished as part of the expansion of the Close Custody Facility. The assessment included determining the presence of lead-based paint using an X-ray fluorescence (XRF) analyzer, a survey for asbestos containing building materials, and compiling an inventory of all hazardous chemicals and potentially hazardous materials located in the buildings.

Asbestos and Lead-based Paint Survey, Celilo Indian Village, The Dalles, OR; Cooper-Zietz Engineers for U.S. Army Corps of Engineers

Project management was provided for asbestos and lead-based paint surveys on 16 houses at the Celilo Indian Village in The Dalles, Oregon that were to be demolished by the U.S. Army Corps of Engineers. Project responsibilities involved testing to determine the presence of lead-based paint using an X-ray fluorescence (XRF) analyzer, and a survey for asbestos-containing building materials.


White Shield supported Envirocon's reclamation effort at this EPA Superfund site, located on the Spokane Indian Reservation, by surveying five buildings for the presence of lead paint and asbestos. Additional activities included identifying and characterizing a wide variety of chemicals, equipment, and refuse left in the buildings, and made recommendations regarding the disposal of the various materials in the still-open mine pit as part of the reclamation effort.

Asbestos Building Materials Survey of China Inn, Lewiston, OR, Washington Trust Bank

The China Inn building, once operated as a Chinese restaurant, is owned by Washington Trust Bank. White Shield was commissioned by Washington Trust Bank to assess the building for the presence of asbestos-containing building materials (ACBM) prior to its demolition. The building was inspected for the presence of building materials suspected to contain asbestos by a certified AHERA Building Inspector on October 26 and 30, 2017. Eight-five samples of suspect materials were collected and placed in zip-lock baggies, which were labeled with sample numbers. The HVAC systems on the roof contained greater than one percent chrysotile asbestos and is considered to be asbestos-containing building material. The volume of the material, though difficult to accurately measure, is estimated to be less than four cubic feet of original liquid spreadable product.

Asbestos Building Materials Evaluation of Dawn Mining Company Building, MIdnite Mine, Ford, WA, Dawn Mining Company

Dawn Mining Company Mill Site property was the former site of a mill used to process uranium ore mined from the nearby Midnite Mine. To date, closure activities have included demolition of several structures on the site. The subject building, known as the Administration Office Building, is the last remaining building on the site that is slated for demolition, in the near future. Previous asbestos survey reports were reviewed and reinspection of the building was conducted in an effort to identify any potential ACM that had not been sampled. At the request of the client, WSI resampled several areas of the drywall system where the material had been shown to test positive for asbestos. The client also requested that WSI provide direction regarding demolition of the building with respect to ACM.
Hazardous Materials Inventory & Categorization, Great Plains Region; Bureau of Indian Affairs
White Shield provided inspection and project management support for the identification of unknown hazardous materials located at 28 Bureau of Indian Affairs road shop buildings located on various Indian Reservations in North Dakota, South Dakota, and Nebraska. The project included using a HAZCAT sampling kit to identify unknown chemical characteristics, compiling a complete list of hazardous materials, their location, description, condition, estimates of cost for removal and disposal, and identifying qualified transportation and disposal contractors to remove the materials. Segregation requirements and situations were identified and addressed that were immediately dangerous to health and the environment. This project covered a large geographic region and required a significant amount of planning and coordination with each Indian Reservation and Tribal Employment Rights Offices. White Shield staff also coordinated and managed the removal and disposal of 51 “lab pack” containers of laboratory wastes found in a warehouse on one of the reservations.

Air Quality Monitoring, Richland Federal Building, Richland, WA; General Services Administration
White Shield supported the General Services Administration with air monitoring services at the Richland, WA Federal Building during contractor removal of asbestos containing materials. The work was performed after normal business hours when the building is un-occupied. Pre-abatement air sampling and an initial inspection of the containment installed by the abatement contractor were conducted to ensure compliance with Federal and State regulations. During the abatement, White Shield provided twice-weekly air monitoring at three locations outside of the containment, and a visual inspection inside the containment weekly. Air sample analysis was conducted by the Phase Contrast Microscopy (PCM) method. When the abatement concluded, White Shield provided a final visual inspection, aggressive air sampling, and Transmission Electron Microscopy (TEM) air sample analysis before removal of the containment by the abatement contractor.

Mercury Tube Sampling 100 BC Area, Hanford Nuclear Reservation, near Richland, WA; Washington Closure Hanford Inc., for the Department of Energy, River Corridor Contract
White Shield assisted with the design and development of procedures for the implementation of a Mercury sampling, separation and amalgamation process. Work on this effort included performing soil sampling for site closeout operations, sampling and packaging unknown radiological and hazardous wastes, developing and maintaining chains of custody, locating sampling points using GPS techniques, transporting samples to the shipping facility and performing analysis on anomalous waste.

Bremerton Gas Works TBA Planning, Bremerton, WA; Ecology and Environment, Inc. for the U.S. Environmental Protection Agency
White Shield created and developed a Project Plan, and Health and Safety Plan for a Targeted Brownfield Assessment (TBA) at this former coal gasification site. This site was previously used to provide electricity and natural gas to the city of Bremerton, WA. In addition to the project, and health and safety plans, White Shield provided field operations for sample documentation and formal reporting. Field operations also consisted of collecting subsurface core samples using the “Geo-probe” push-probe method. Results from the fieldwork were detailed in a formal report.
Hazardous Materials Surveys, Asbestos Lead Paint

Sub-Contractor Health & Safety Oversight, Washington Closure Hanford, Inc. for the Department of Energy, River Corridor Contract

White Shield is providing Health and Safety Officer oversight of sub-contractors for the 100-D/DR Remediation Site on the Hanford Nuclear Reservation. The Health and Safety Officer insures compliance with Washington Closure Hanford contractual Health and Safety requirements and the DOE 10 CFR 851 Compliance Matrix. Assistance is provided for planning of the day meetings, daily and weekly site safety inspections, development and implementation of Job Hazard Analysis, Integrated Work Control Packages, Operational Monitoring Plans for ACGIH sampling, and implementing of the DOE-driven Integrated Environmental Safety Management Systems.

Waste Characterization Sampling Services, Hanford Nuclear Reservation near Richland, WA; Washington Closure Hanford, Inc. for the Department of Energy, River Corridor Contract

White Shield is providing facility and waste characterization sampling in support of the River Corridor Contract (RCC) projects on sites scattered throughout Hanford Nuclear Reservation. Personnel are collecting and preparing samples for the Field Remediation (F4) Project; Deactivation, Decommissioning, Decontamination, and Demolition (D4) Project; and the Interim Safe Storage (ISS) Project activities in the 100, 300, 400, and 600 Areas of the Hanford Site. Samples are being collected from a variety of media including hazardous waste, radiological waste, construction debris, asbestos containing materials, miscellaneous aqueous liquids, bulk solids, soils and sediments, unexpected media and waste forms, and biological materials. To facilitate sample shipping, White Shield is maintaining a secure facility as required to provide defensible methods of maintaining sample integrity and delayed custody transfer. We perform weekly, monthly and quarterly facility inspections (safety equipment, chemical inventory, temperature logs etc.) of the facility. In addition to supporting sampling activities throughout the RCC, White Shield developed spreadsheets for waste processing and tracking data, operated X-Ray Fluorescence equipment and GPS units, interpreted sampling plans and staked sampling point locations and input data into the sample tracking database.


White Shield performed a hazardous materials assessment for nine buildings at the Washington State Penitentiary that will be demolished as part of the expansion of the Close Custody Facility. The assessment included determining the presence of lead-based paint using an X-ray fluorescence (XRF) analyzer, a survey for asbestos containing building materials, and compiling an inventory of all hazardous chemicals and potentially hazardous materials located in the buildings.

Lead-based Paint Inspection and Risk Assessments, Various Naval Bases, WA; URS for the Department of Navy

White Shield provided lead-based paint inspection and risk assessment services at naval housing facilities located on various naval facilities throughout the Puget Sound Region. The project involved the use of an X-ray fluorescence (XRF) analyzer and physical sampling of suspected lead-based paint containing material, as well as providing electronic documentation and daily reports. Facilities included the Bangor Naval Submarine Base, the Bremerton Naval Shipyard, and the Whidbey Island Naval Air Station with over 110 housing units assessed.
Remedial Investigation, Field Sampling, & Compliance Projects

Coeur d’Alene Tribe Groundwater studies for the Atlas E Missile Facility Contamination, Plummer, ID, Coeur D'Alene Tribe
An Atlas E Missile Facility was built and used around 1960-1965 for US Missile defense systems. Even though this facility was removed, the client for this project is concerned about the potential contamination to its natural resources, in particular water, by this facility. Potential contaminants are solvents, degreasers, transformer fluids, diesel oil, RP-1 fuel (kerosene), lubrication oil, hydraulic fluids, nickel-cadmium batteries, polychlorinated biphenyl (PCB), hydrocarbons, and metals such as mercury and lead. White Shield has conducted quarterly sampling of sentinel wells, residential, commercial and industrial wells in the area. White Shield has also updated the sampling and analysis plan, and Strategic Implementation Plan for groundwater in the region.

Remedial Investigation for Gasoline Leak, Smitty’s Conoco, Kennewick, WA; RH Smith Distributing
White Shield provided a Hydrogeologist and Project Manager for the investigation and remediation of a 6500-gallon gasoline leak at a service station in Kennewick, Washington. The site is within the Wellhead Protection Area for one of the City’s municipal drinking water wells. The investigation included sampling of soils in trenches used for fuel distribution lines, the installation and sampling of four groundwater-monitoring wells to determine if groundwater was impacted by the release, and the design and installation of a product recovery system to recover floating product found on the groundwater. Two of the wells were constructed as 4 inch wells to facilitate floating product removal. White Shield’s Project Manager designed a state-of-the-art product recovery system, using a floating skimmer and pump that will remove floating product but will not capture water should the water level rise above the intake of the skimmer. The system is automated to maintain 24-hour operation. Additional support included the installation and sampling of three additional groundwater-monitoring wells at the site to further delineate the extent of the groundwater plume. All work was coordinated with the City of Kennewick, the Washington State Department of Ecology, and the insurance carrier for R.H. Smith Distributing.

U.S. Navy Other Environmental Liability (OEL), Various Naval Bases, WA; URS for the Department of the Navy
White Shield, working as subcontractor for URS Corporation, assisted in conducting “Other Environmental Liability” (OEL) inventories at several Puget Sound Naval bases. The purpose of the project was to assist the Navy in the accounting of Non-DERP environmental liabilities that were never accounted for as required by Federal Accounting Standards. The project created an inventory of all equipment and facilities that would require cleaning before being moved, or prior to base closure. Creating the inventory required an audit of Spill Prevention Control and Countermeasure Plans, Pollution Prevention Surveys, and other Environmental Compliance Documentation. The project also required performing compliance assessments to document environmental liabilities within the Naval industrial complex including warehouses, maintenance shops, office buildings, firing ranges, machining equipment, tanks, hazardous wastes and hazardous material storage areas, storm water impoundments and transformers. The naval bases included Bangor, Keyport, Whidbey Island, and the Bremerton Naval Shipyard.
White Shield assisted CH2M-Hill and EPA with oversight of the remedial action taken by ASARCO under CERCLA at the main ASARCO facility and smelter site north of Tacoma, Washington. The action included the replacement of arsenic contaminated surface soils in adjacent areas. The work was monitored for compliance with the Record of Decision, the approved remedial design, and other documents relating to the project. The activities included excavation of contaminated materials, placement of contaminated materials in the on-site containment facility (OCF), demolition of on-site structures, site grading, drainage and capping, and review of related PRP documents. Air monitoring was also provided during remedial action activities in 2007. White Shield prepared monthly technical status reports.

**Remedial Investigation and Feasibility Studies, Alexander Farms, Prosser, WA; Dan Alexander, Alexander Farms**

White Shield provided environmental services required for the design and implementation of a Remedial Action Plan for Dinoseb contamination (an herbicide) at the Yakima Chief Ranches. Services included emergency interim action, soil characterization and removal, emergency and long-term groundwater characterization and modeling, and Remedial Investigation/Feasibility Study (RI/FS). The RI/FS work plan and related documentation featured potential site remedial technologies that included soil and groundwater cleanup options to meet MTCA cleanup standards. A transient solute groundwater model was developed to accurately describe the site’s aquifers and an irrigation canal that transects the site creating a complex hydrologic condition at the site. White Shield also coordinated with the property owner, Washington Department of Ecology, EPA Region X, and local residences in order to investigate and monitor the site’s soil and groundwater. Presently, the site is undergoing long-term groundwater monitoring and sampling while a Corrective Action Plan and final consent decree is being negotiated. Groundwater monitoring and sampling activities are scheduled on a quarterly basis as outlined in the Site Sampling and Analysis Plan.

**Upper Columbia River Field Investigation and Sampling; CH2M Hill for the Environmental Protection Agency, Region 10**

White Shield provided CH2M-Hill with a Sample Processing Coordinator for the Upper Columbia River Sampling Project in order to coordinate sediment sample processing and packaging, development of Chain of Custody and Forms II Lite documentation, arrangement of shipment and transport, and assistance with the sample collection activities. A subsequent task order directed the collection of fish tissue samples from within six different sampling areas. The fish were collected by a variety of methods including electro-fishing, gill netting, and traps. The collected fish were transported to a central processing area at the Kettle Falls Marina where they were weighed, measured, catalogued, filleted, and packed for shipment. The Coordinator position required an understanding of CLP procedures and the CLP Guidance document ("CLP Guidance for Field Samplers", OSWER 9240.0-35, Aug 2004) and familiarity with laboratory analytical procedures and QA/QC considerations.
White Shield provided facility and waste characterization sampling services in support of the River Corridor Closure (RCC) Project activities in the 100, 300, 400, and 600 areas of the Hanford Nuclear Reservation Columbia River corridor, an area of approximately 210 square miles along the outer edge of the Hanford Reservation that includes major portions of the Hanford Reach National Monument. RCC activities, initially expected to be completed in 2012 at an estimated cost of $1.9 billion continue today. Samples were collected, prepared, and analyzed to support the Field Remediation (FR) Project, the Deactivation, Decommissioning, Decontamination, and Demolition (D4) Project, the Interim Safe Storage (ISS) Project, and the Waste Operations Project.

Samples were collected from a variety of media including mixed hazardous waste, radiological waste, construction debris, asbestos-containing materials, miscellaneous aqueous liquids, bulk solids, soils and sediments, unexpected media and waste forms, and biological materials. Activities included the use of X-Ray Fluorescence (XRF) equipment to field screen potential contaminants of concern (metals), and provided sample shipping (packaged, labeled, and shipped to designated laboratories), reporting and documentation, and database management in accordance with DOT shipping requirements and DOE protocols. Overall work on the RCC Project has included performing soil and groundwater sampling for site closeout operations, sampling and packaging unknown radiological and mixed wastes, developing and maintaining chains of custody, locating sampling points using GPS techniques, transporting samples to the shipping facility, and performing analysis on hazardous and anomalous waste.

Remedial Investigation for Pesticide Contamination, Prosser, WA; Port of Benton

White Shield conducted a Remedial Investigation to identify and remEDIATE soil and groundwater contaminated with pesticides at a former aerial spraying operation located at the Prosser Airport in Prosser, Washington. The site was operated as a base for aerial spraying of pesticides and herbicides, beginning prior to 1966. The contaminants of concern are petroleum from a former aviation fuel tank, chlorinated herbicides and pesticides including DDT and Dinoseb. White Shield project managers oversaw the excavation of approximately 1,300 tons of DDT contaminated soils for disposal. To determine when DDT levels in the soils were below MTCa cleanup levels, soil samples were analyzed for DDT in the field using immunoassay analytical techniques. White Shield also provided oversight for the installation and sampling of four monitoring wells at the site to characterize the groundwater flow direction and gradient, and to determine the levels of pesticides, herbicides, and petroleum constituent in the water. Coordination between the Department of Ecology and the Port of Benton was provided to identify remedial options for the soils and groundwater.
White Shield provided post–remedial action groundwater monitoring services at a former pesticide warehouse located at the DNR Webster Nursery in Tumwater, Washington. The nursery covers approximately 270 acres but the area of concern, a former pesticide storage building, is approximately 1/3 acre in size in the southeast corner of the nursery. A floor drain system at the former pesticide warehouse directed any spills or wash water to a concrete underground storage tank outside the building. In 1982, DNR upgraded the concrete underground storage tank with a metal underground storage tank. The metal underground storage tank was removed in July 1996, and about 70 cubic yards of pesticide-contaminated soils were removed and disposed of. Four groundwater-monitoring wells were installed in August 1996. Several pesticides, some of which were above cleanup standards, were detected in three of the four monitoring wells. In 1998, DNR entered into an Agreed Order with the Department of Ecology to perform a Remedial Investigation/Feasibility Study (RI/FS) at the site. Additional wells were installed during this investigation. Following the RI/FS, a Corrective Action Plan was developed to monitor six monitoring wells at the site on a semi-annual basis.

USFS Underground Injection Control (UIC) Decommissioning Activities, Troutdale Air Tanker Base, OR; USDA Forest Service, Mount Hood National Forest
The Troutdale Air Tanker Base is a USFS-owned administrative unit, managed under the Zigzag Ranger District of the Mount Hood National Forest. The site consists of a 9.65-acre parcel adjacent to the Troutdale Airport in Troutdale, Oregon. The Troutdale Air Tanker Base was in use from 1984 through 2013 for aerial fire suppression support for wild-land fires throughout the Pacific Northwest. Air Tanker Operations at the site ceased in 2013. The six UICs at the site were associated with a grated aircraft wash water collection trench that runs along the western edge of the tanker loading ramps on the figure-8 aircraft apron that constitutes a large portion of the property. Cleaning of the wash down trench and six UICs generated approximately 4.75 tons of waste sediment. Removal of the six UIC structures generated approximately 14 cubic yards of waste concrete. Rather than containerizing the generated waste in a single 10-cubic-yard box, the sediment was placed in a 10-cubic yard box and the concrete was placed in two 20-cubic-yard boxes for load weight distribution purposes. In addition, since the sediment and concrete were placed in separate containers, the concrete debris was able to be transported offsite for recycling rather than disposal. The UIC closure meets DEQ closure requirements (OAR 340-044-0040) and OWRD abandonment requirements (OAR 690-240-0030) for UICs.

USFS Cowlitz Valley and Mount Adams Ranger Station Injection Well Decommissioning, USDA Forest Service, Gifford Pinchot National Forest
White Shield performed an investigation of the injection well system and discovered that the sediment was contaminated with heavy oils, heavy metals, and trace amounts of pesticides. White Shield and NRC subcontractor provided cleaning of injection wells and piping, decommissioning of wells, grouting of wells, and disposal of contaminated materials. The wells were located in a warehouse/garage structure under concrete slabs and the drain lines extended outside the building under asphalt pavement. The drain lines were flushed and sediment accumulated by a vacuum truck. The contaminated materials was sampled and profiled for disposal at a permitted facility. Subsequently, the wells and piping were grouted for to decommission them. The project required two days effort on each site with three person crew.
Environmental Projects
Remediation & Cleanup

Pasco Airport Pesticide and Herbicide Contamination Soil Removal, Pasco, WA for the Port of Pasco

During new construction, the general contractor discovered discolored and pungent smelling soils and stopped work. After initial investigation and sampling, the site was found to be contaminated with historical agricultural herbicides and insecticides during the demolition of old buildings and preparing the site. Dinoseb, a toxic poison, was one of the contaminants. White Shield was contracted for the expeditious assessment, removal, and disposal for a contaminated soil project. White Shield engineers were responsible for coordinating with Department of Ecology, Port Officials, Port Engineers, and the contractors to manage the contaminated area. The project required the removal of 124 CY of contaminated soil that required sampling, profiling, soil excavation in hazmat gear, staging of hazardous waste roll-off containers, hauling and disposal to a permitted facility. The efforts of White Shield personnel successfully allowed the continuation of the construction efforts on the site.

Aerial Spill Characterization and Site Cleanup, Manson, WA, Okanogan – Wenatchee National Forest.

White Shield personnel responded to an emergency call from the USFS following the spill of approximately 30 gallons of diesel fuel onto private lands by a helicopter supporting local wildfire suppression activities. The fuel was contained in six jerry cans, which ruptured when they were accidently dropped by the helicopter while transporting the fuel to the active fire line. Mr. Rodgers reported to the site, identified the spill area, collected surface soil samples for analysis, and covered the affected area with plastic sheeting to retard further infiltration in the event of rain. Following his analysis of analytical data, Mr. Rodgers directed the excavation of the affected soils, regrading and reseeding of the disturbed areas, and disposal of contaminated soil at the Wenatchee landfill. A summary report documenting the cleanup effort was prepared.

USFS Pine Creek Contaminated Soil Removal, Mount Saint Helen’s National Volcanic, USDA Forest Service, Gifford Pinchot National Forest

White Shield provided removal of approximately 80 tons of diesel contaminated soil located at the USFS Pine Creek Work Center facility, Mount Saint Helens National Volcanic Monument. The site was formerly a diesel UST location that was not fully remediated following a UST removal action. The project required excavation of diesel contaminated soil, transport, and disposal followed by sampling and analysis. The project was completed on schedule using with a 3 person crew, including the site supervisor, trackhoe and operator, and dump truck.

Marijuana Grow Site Cleanup, Wild Rivers Ranger District, OR, Rogue River – Siskiyou National Forest

Two marijuana grow sites discovered in the area were eradicated in September, 2015. Poor weather conditions during planned event in late fall of 2016 prevented the use of the helicopter that had been chartered to haul refuse from the staging area, where it would be loaded into a truck. Given deteriorating weather conditions and impending winter, the cleanup effort was postponed until the summer of 2017, when weather conditions were likely to be more consistent and more favorable for the field effort and helicopter support. The team hiked from USFS roads down 1000 vertical feet to the sites. Several thousand linear feet of plastic irrigation hose was gathered, along with a wide assortment of domestic garbage including paper, tinned food, cans, bottles, and plastic. Approximately 50 pounds of bagged fertilizer was also removed from the site. The refuse was wrapped and placed in a sling for transport by helicopter, and flown to the staging area where it was loaded into a truck. All visible refuse and debris, approximately 1000 pounds, was collected and hauled from the staging area to the Hillsboro, Oregon Landfill for disposal.
Phase II Environmental Assessment and Tank Removal, Vashon, WA; K2 Corporation

White Shield (WSI) provided K2 Corporation with a Phase II Environmental Site Assessment at their facility located on Vashon Island. WSI installed eleven borings at selected locations around the facility to investigate the potential for soil and/or groundwater contamination. All borings were advanced using a “Geoprobe” drill rig. The drill rig pushed a 2 inch “probe” to depths of approximately eight to twelve feet below ground surface. At each four foot interval, samples were collected for possible chemical analysis. The soil was visually examined for evidence of contamination and screened using an Organic Vapor Analyzer (OVA). Upon reaching groundwater a temporary 1-inch diameter well was placed in the boring and the water sampled for the location specific contaminants of concern. WSI also performed a Ground Penetrating Radar (GPR) and magnetic survey to determine the exact location of a 300-gallon heating oil tank and to determine if a second tank was present. WSI’s Certified Site Assessor and a Certified Tank Decommissioner (Central Environmental Construction) cleaned, decommissioned, removed and disposed of the tank. WSI visually checked the soils beneath the tank and piping for signs of leakage, and collected five clearance samples from the sidewall and base of the tank excavation for diesel/heavy oil analysis. Approximately one hundred cubic yards of petroleum contaminated soil was excavated for disposal. Contaminated soil had migrated under the building at the site, and WSI is working with K2 and the Washington State Department of Ecology on a plan to address the future soil remediation.

Genesee Union Hardware Store Fueling Station, Genesee, ID; Central Environmental Construction for Pacific Northwest Farmer Cooperative

White Shield (WSI) provided site assessment and remediation oversight services at the Genesee Warehouse (now Pacific Northwest Farmer Cooperative) Facility in Genesee, Idaho. Upon lifting one of the gasoline aboveground storage tanks, it was discovered that a 2” hole was present in the bottom of the tank. Following tank removal, WSI began excavating petroleum-contaminated soils from the site. As excavation progressed, it was discovered that the contaminated soils extended to at least 10 to 14 feet below the former base of the tank and also below the depth that groundwater was encountered, approximately 11 bgs. To facilitate the remediation WSI submitted a plan to the Idaho Department of Environmental Quality requesting approval to dewater the excavation and remove contaminated soils to a depth of 14 bgs. WSI removed approximately 7,000 gallons of water from the excavation and placed it in a former diesel tank for on-site air stripping treatment. Upon completion of the excavation, WSI collected 10 samples from the base of the excavation and 17 samples from the sidewalls to determine if the contaminated soils had been removed. Sample analyses results were used to run the Idaho Risk Evaluation Model (REM) for Risk Based cleanups. The results of the REM showed the soil was no longer an exposure pathway of concern. As a result the excavation was backfilled and a plan to install groundwater monitoring wells was submitted to the Idaho Department of Environmental Quality.

UST Management Services, Washington State Defense Facilities; US Army Corps of Engineers

White Shield performed services for the preparation of work plans, health and safety plans, remedial investigations, sampling and analysis, reporting, and site monitoring of activities associated with the removal of underground storage tanks for the Defense Environmental Restoration Program. Sites included Geiger Field Airbase, George Wright Air Base, Larson Air Force Base, Fort Lewis, and former NIKE Missile Sites. The project required services for nearly 1,000 USTs including aircraft fuel, heating oil, and gas and diesel systems.
Environmental Projects
Underground Storage Tanks

Remedial Investigation for Gasoline Leak, Smitty’s Conoco, Kennewick, WA; RH Smith Distributing
White Shield provided a Hydrogeologist and Project Manager for the investigation and remediation of a 6500-gallon gasoline leak at a service station in Kennewick, Washington. The site is within the Wellhead Protection Area for one of the City’s municipal drinking water wells. To date the investigation has included sampling of soils in trenches used for fuel distribution lines, the installation and sampling of four groundwater-monitoring wells to determine if groundwater was impacted by the release, and the design and installation of a product recovery system to recover floating product found on the groundwater. Two of the wells were constructed as 4 inch wells to facilitate floating product removal. White Shield’s Project Manager designed a state-of-the-art product recovery system, using a floating skimmer and pump that will remove floating product but will not capture water should the water level rise above the intake of the skimmer. The system is automated to maintain 24-hour operation. Additional support included the installation and sampling of three additional groundwater-monitoring wells at the site to further delineate the extent of the groundwater plume. All work is being coordinated with the City of Kennewick, the Washington State Department of Ecology, and the insurance carrier for R.H. Smith Distributing.

Stehekin Boat Landing UST Removal/Remediation, Stehekin, WA; National Park Service
The National Park Service discovered gasoline-contaminated soil during the excavation of a trench adjacent to the Stehekin boat landing. As a result, White Shield managed the removal of two underground storage tanks and 275 cubic yards of contaminated soil. Due to the remote nature of the site, the cleanup process was directed based entirely upon field screening results. Contaminated soil was removed from the site and transported to a bio-treatment site that was constructed near the site. The project required mobilizing personnel and equipment to this remote site by air and water, utilizing limited resources. White Shield’s quick response and timely completion was successful in removing UST’s and contaminated soils before rising lake levels flooded the site, thus preventing a release to surface water.

Site Characterization and Remediation of Leaking Underground Storage Tanks (LUSTs), Contaminated Soils for Marion Drain Road, and Satus Creek Store USTs, Bristol Environmental and Remediation
White Shield Inc (WSI) mobilized to the jobsite in Eastern Washington at two locations to remove underground storage tanks and contaminated soils. The project including the site supervisor, and two team members with excavator and dump truck. There were three USTS at Satus Creek and three USTS at the Marion Drain Sites that contained gasoline and diesel fuels. The USTS were decommissioned and contaminated soils (20 Cubic Yards) were transported for disposal. Residual wastes and water found in the USTS (50 gallons) was properly disposed from each tank. Both sites were provided with clean backfill and compacted. Waste profiles are currently waiting for Yakima County to approval.

Hanford 300-Area UST Removal, Hanford Nuclear Reservation, Richland, WA; Washington Closure Hanford, LLC for the US Department of Energy
White Shield supported Washington Closure Hanford with the removal of an abandoned 5000 gallon UST in the 300-area of the Hanford Nuclear Reservation. The tank, located at Facility 3621D that is slated for demolition, was formerly used to supply diesel fuel for large generators, and was emptied and placed into temporary closure in 2007. This decommissioning process was required to be completed prior to the facility demolition.
Paradise Inn UST De-commissioning, Mt. Rainier National Park, Paradise, WA; Central Environmental Construction for the National Park Service

During a planned re-design and construction of the Paradise Inn, the main lodge in Mt. Rainier National Park at Paradise, Washington, it was found that two underground storage tanks (USTs) and some related lines that supply heating oil to the facility were leaking. White Shield assisted Central Environmental and the National Park Service in overseeing the removal of the tanks and remediation of the project site. The regulatory agency responsible for this project was the Tacoma-Pierce County Health Department (TPCHD). Evidence of impacted soil was found around the UST fill ports, and in the already excavated area underneath the Paradise Inn dining room. Odors of impacted soils were also reported by personnel on-site east of the north-south oriented portion of the inn, and demolition of a sump in the boiler room needed to be halted when it was found to be partially filled with free-liquid heating oil. Further removal of piping underneath the building was determined to increase the likelihood of unintended spillage, due to the many yards of intertwined supply pipes. TPCHD concluded that careful abandonment with the pipes being drained and capped was the most reasonable solution, and was left to National Park Service and the WSI Project Manager’s discretion. The tanks will be pumped and stabilized for transportation to the Kautz Creek storage area to be cut and cleaned before transportation out of the park.

Underground Storage Tank (UST) Investigation and Soil Sampling Report, Moses Lake, WA for POW Contracting and City of Moses Lake

The Heating Oil Tank (HOT) was discovered during the excavation for the installation of new lines for a force main, water line, and sanitary sewer for the City of Moses Lake, WA. The 8,000 gallon underground HOT was on the site between existing buildings. WSI provided oversight of the tank removal and soil sampling report to determine if Petroleum Products had been released into the soil over time. Underground HOTs are not regulated by the EPA or the Washington State Department of Ecology and sampling nor testing is required unless a leak has occurred. We conducted the sampling of three locations underneath the HOT after its removal. Samples were collected from approximately 12.0 ft. below ground surface. The tank excavation and removal activities were fully documented during extraction and all photographs and videos collected were provided to POW Contracting.

USFS Pine & Unity Compound Heating Oil Tank Removal and Contaminated Soil Removal, for Wallowa Whitman National Forest

White Shield performed a removal of heating oil underground storage tanks (UHOTS) and contaminated soil located at the USFS Pine Work Center, in Halfway, Oregon. Contract required removal of two UHOTs, collect soil samples for analysis for soils, disposal of contaminated soils, and provide a set of two new above ground heating oil tanks. At the Unity Compound in Unity, Oregon, the contract required excavation and disposal of approximately five cubic yards of heating oil contaminated soil adjacent to a Forest Service Buildings. At the Pine Compound, one of the UHOTs had several holes and caused contamination of groundwater. The project was completed on schedule using with a 3-person crew, including the site supervisor, trackhoe and operator, and dump truck. Final deliverables required reporting to the Oregon Department of Environmental Quality of the work activities and sample results.
Kenyon Zero Cold Storage Phase I and II Environmental Site Assessments, Grandview, WA; Kenyon Zero Cold Storage
White Shield directed a Phase I Environmental Site Assessment (ESA) in accordance with ATSM Standard E1527-05 at this food processing facility located in an industrial area in the City of Grandview, Washington. The purpose of the Phase I ESA was to evaluate the potential presence of recognized environmental conditions (RECs) at the site. Based on comprehensive review and assessment, numerous RECs and suspected RECs were identified. Some of these included the potential presence of an underground storage tank (UST), above ground storage tanks (ASTs), the former presence of a dry cleaner on the site (a known potential source of persistent chlorinated hydrocarbons), the presence of oil in several pits and sumps, potential contaminant migration from an off-site fuel and oil distributor, the presence of former railroad tracks (known persistent hazards include creosote and pentachlorophenol, and large amounts of herbicides used to keep tracks clear), the possible presence of transformer oil on the ground, and adjacent and nearby UST removals and clean-ups. It was concluded that some of the RECs could pose a significant risk to the soil and the groundwater. Based on the findings of the Phase I ESA, White Shield recommended and performed a Phase II ESA to further investigate and sample potential contaminants of concern. Twenty-three Geoprobe borings were installed at selected locations throughout the facility and grounds to facilitate soil and groundwater sampling for location-specific contaminants of concern, and samples were taken from a transformer that was observed leaking on the site. A summary report was prepared documenting the analytical results and findings.

Phase I Environmental Site Assessment, Hunchback Parcels (2009 and 2012); near Cherryville, OR; USDA Forest Service IDIQ Contract: AG-046W-D-09-0135; US Forest Service
White Shield, Inc. performed a Phase I ESA of the Hunchback parcels near Cherryville, OR for Mt. Hood National Forest prior to a land exchange in which it was anticipated the subject parcel would be traded for other lands. The work was in accordance with the ASTM Standard E 1527-05. The purpose of the ESA was to evaluate the likelihood for the presence of recognized environmental conditions (RECs) at the site. White Shield reviewed available information from various sources with respect to the historical uses of the property, including assessor’s records, permits, historical maps, and aerial photographs. Based on the studies and observations, the assessment revealed no evidence of RECs in connection with the property.

Phase I Environmental Site Assessment, Severson/Selinco Properties; Sequim, WA; Washington State Department of Fish and Wildlife
Washington State Department of Fish and Wildlife, on behalf of the Trust for the Public Lands, retained White Shield to conduct a Phase I Environmental Site Assessment (ESA) of the Severson/Selinco Properties, LLC/TPL located in Sequim, Washington. These properties consisted of approximately 100 acres of agricultural and undeveloped land along the Dungeness River. The assessment was performed in accordance with the American Society for Testing and Materials (ASTM) E 1527-00. The purpose of the ESA was to evaluate the likelihood for the presence of recognized environmental conditions (RECs) at the site. White Shield reviewed available information from various sources with respect to the historical uses of the property, including assessor’s records, permits, historical maps, and aerial photographs. Based on our studies and observations, it was concluded that two 200-gallon above ground fuel storage tanks and five drums of unknown petroleum products located in and adjacent to a barn on the northern portion of the subject site were RECs.
Environmental Projects
Phase 1 & II Site Assessments

Dungeness River Match, Sequim WA; Washington State Department of Fish and Wildlife

White Shield recently assisted Fish & Wildlife by conducting a Phase I Environmental Site Assessment on Olympic Game Farm. An on-site reconnaissance of the property was performed to assess the potential presence of obvious hazardous materials/waste. A visual survey of adjacent properties was conducted in order to evaluate the potential for past or present hazardous materials that could affect the site. White Shield reviewed all appropriate databases to determine the location of hazardous waste generators within one mile of the property, and also reviewed historical aerial photographs, appropriate maps, geotechnical data & geologic reports for the property and adjacent properties to obtain information regarding potential contamination. The chain of title was reviewed to evaluate the potential for prior owners to have generated or disposed of hazardous materials on site.

Central Link Light Rail Alignment Phase I and II Environmental Site Investigations, Seattle, WA; Garry Struthers & Associates for Sound Transit

White Shield provided support for Alignment Screening, Phase I Environmental Site Assessments (ESAs), and Phase II ESA Subsurface Investigations for properties along segments of the Central Link Light Rail Alignment for Sound Transit in Seattle, Washington. During Alignment Screening and Phase I ESAs, White Shield identified recognized environmental conditions for each property. At sites requiring Phase II ESAs, subsurface investigations were conducted per ASTM standards in order to define and characterize the extent of the contamination. Typical soil and groundwater contaminants in the Rainier Valley area of Seattle include petroleum products, priority pollutant metals, and solvents. As a member of the consulting team for this alignment, White Shield assisted Sound Transit real estate agents and assessors and coordinated with the owners of the properties in order to obtain rights-of-entry to sites. White Shield also provided an interpreter for the predominantly Asian community.

Phase I Environmental Site Assessment for Hermiston Power Project Hermiston, OR, for Calpine Corporation

White Shield performed a Phase I Environmental Site Assessment (ESA) of the Hermiston Power Project property located three miles south of Hermiston, OR. The project site has been owned and operated by Calpine Corporation since 2002. Calpine Corporation requested the services of WSI to aid in the refinancing of the facility. The purpose of the ESA was to evaluate the likelihood of recognized environmental conditions (RECs) being present at the site. The term “recognized environmental conditions” means the presence or likely presence of regulated hazardous or dangerous wastes and/or substances, including petroleum products, under conditions that indicate an existing release, a past release, or a material threat of a release into the structures of the property or into the ground, groundwater, or surface water of the property. Hazardous or dangerous wastes and/or substances and release reporting requirements are defined by the Oregon Administrative Rules, Department of Environmental Quality, Division 100 and the Underground Storage Tank Compliance Rules, Division 150.
Phase I Environmental Site Assessment at Devils Lake, Lincoln City, OR; Confederate Tribes of Siletz Tribe of Oregon
A Phase I Environmental Site Assessment was completed in compliance with ASTM Standards E1527 and E1528 on a 38-acre undeveloped parcel. Tasks included site reconnaissance, identifying known and potential toxic hazards, researching historical and current site uses, reviewing state and federal toxic contamination and cleanup databases, and technical report writing.

Quarterhorse Ranch Underground Storage Tank (UST) removal, Phase 1 Environmental Site Assessment, and Site Cleanup, Kennewick, WA; for the AKKK Trust
To prepare the Kennewick Quarter Horse Ranch for future land sale, White Shield Inc (WSI) was contracted to perform a UST removal, site cleanup of environmental waste, and a Phase 1 ESA according to ASTM E1527-13. The subject property consists of five completely developed contiguous Benton County agricultural parcels totaling approximately 44.2 acres. The 5 parcels include numerous buildings related to the equestrian business, petroleum storage tanks, stables, corrals, supply storage, tack building, two homes, and an office. The UST removal and site assessment was for a diesel tank that is approximately 12 feet in length, and a gas tank that is approximately 12 feet in length. The work includes removal of piping and concrete pads, UST environmental site assessment (testing), backfill and compaction, and grading to existing conditions. Decommissioning activities were completed according to regulatory and industry standards. The tanks were scrapped and the metal sent to recycle yard. No contamination was found from past usage of the tank systems thus resulting in a “clean” closure. Site Cleanup activities consisted of removal of approximately 150 to 200 used tires, investigation of soils where used oil was spilled, and investigation of old metal anomaly found during geophysical survey. The sampling and analysis of soils was conducted were 1-liter used oil containers were found amongst a pile of used tires. The contaminated soil and the used tires were removed and sent to Kennewick disposal facility. The metal anomaly was removed and sent for metal recycling at the local scrap yard.

Phase II Environmental Site Assessment Oversight, INVESTCO - LOONEY Site, Tacoma WA; Environmental Management Services, LLC
White Shield provided oversight and report review for a Phase II Environmental Site Assessment at a former steam plant located along the Thea Foss Waterway in Tacoma, Washington. The plant site dated to the late 1800s, and used wood for fuel before being converted to bunker fuel. White Shield staff oversaw the installation of eight push-probe borings and the excavation of two test pits. Soils and groundwater were sampled for petroleum hydrocarbons, PCBs, and metals.
Section 4
GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

“A system for capturing, storing, checking, integrating, manipulating, analyzing, and displaying data which are spatially referenced to the Earth. This is normally considered a spatially referenced computer data base and appropriate applications software.”
White Shield Inc has been providing geospatial services for more than 30 years and is an experienced geospatial company providing GIS services and survey & mapping. We demonstrate project experience for geospatial projects for many federal agencies including the US Forest Service, US Department of Energy, Federal Highway Administration, the Bureau of Indian Affairs, the Indian Health Service, and U.S. Army Corps of Engineers. We utilize GIS systems for planning, monitoring, mapping for the maximizing efficiencies of scarce resources and for understanding and knowledge of our natural and built environment.

- Gas, Electrical, Water Utilities
- Telecommunication Systems
- Asset Management
- Spatial Analysis
- Natural Resource Mapping
- Monitor Changes in the Natural or Built Environment
- Transportation
- Real Estate
- Public Safety
- Education
- Health
- Government

Professional Qualifications
Our President-Owner, Stuart Fricke, provides the leadership and qualifications for the GIS services offered by the company. We have the following qualifications:

- MSA degree with a minimum of 5 years working in ArcGIS software,
- Skilled Project management and Team Building,
- Over 30 years experience in the geospatial field,
- 25 years experience working in environmental projects including compliance with NEPA, CWA, CERCLA, and RCRA.
- Strong computer skills including experience Geo-referencing historical drawings,
- Working knowledge of Adobe Professional, and Microsoft Office software
- Experience in developing presentations using a variety of media and technology,
- Ability to work well in a team environment, and
- Flexible and willing to help wherever needed.

Equipment and Resources Available:
Our company has the personnel, equipment, software, and expertise to provide these services. We can support these efforts with a staff GIS Specialist, ESRI ArcGIS software, geodectic grade and resource grade GPS equipment, and 4-wheel drive truck and equipment for field work. Our company utilizes ESRI ArcGIS 10.5 Geographical Information System software, Adobe Professional, and MS Office software.

We have the following projects that are GIS related or demonstrate our ability to manage large contracts with multiple task orders, simultaneously.
GIS Database development for Umatilla Cantonment
Area and Training grounds, Umatilla, Oregon
Oregon National Guard (Agency), Dana Engineering
(prime contractor). White Shield provided GIS Mapping for Dana Engineer to map new telecommunication networks. As GIS Specialist, Mr. Fricke created ESRI database for telecommunications plan for the Umatilla Cantonment Area and Training grounds. GIS data is compliant with Tri-Services Spatial Data Standards (SDSFIE), and all metadata conformed to FGDC metadata standards. A thematic map was developed with layers that meet requirements of the National Guard Bureau memorandum -“Cartographic Standard Requirements for GIS Products”.

GIS Mapping for Little Missouri River and Lake Sakakawea Crossing, FBIR Bridge Feasibility Study, Fort Berthold Indian Reservation, Three Affiliated Tribes of the Fort Berthold Reservation (agency)
White Shield provided GIS Mapping for Little Missouri River and Lake Sakakawea Crossing, Fort Berthold Reservation, North Dakota, for the Three Affiliated Tribes – Mandan, Hidatsa, and Arikara Nation. As GIS Specialist, Mr. Fricke perform research for current and historical map files to support a bridge feasibility study for river crossings on the Little Missouri River, and Lake Sakakawea on the Fort Berthold Reservation for the Mandan, Hidatsa, and Arrikara Nation. Mr. Fricke is producing a variety of maps – ownerships, proposed bridge approaches and river crossings, contour maps, and aerial imagery – to support the engineers and planners.

Development of GIS database for the Facility Master Plan Phase II, Pasco School District; MGT of America Consulting LLC
White Shield provided GIS Mapping for the Pasco School District by utilizing spatial analysis techniques to optimize the school districting maps for all students given the large changes in population of the students and construction of four new schools. Mr. Fricke was the GIS specialist for the creation of geodatabase and mapping products to support the facility master plan for the entire Pasco School District. He geo-coded all students based on District SIS file, created shape files for District GIS map based, provided district and school views for project analysis, and all files were organized into an ArcGIS geodatabase.

Mercer Island Right of Way Mapping; City of Mercer Island, Washington
White Shield performed GIS surveying and analysis as well as coordinating the AutoCAD data for the City of Mercer Island, Right-of-Way Data Development Project. The project involved the development of a GPS survey network and right-of-way mapping for the entire City of Mercer Island.
Mason County GPS Control Survey & GIS Parcel Mapping; Mason County, Washington

As the GIS consultant to Mason County, White Shield was responsible for the development of a GPS survey network and the development of a high accuracy parcel base map for the new County GIS database. White Shield worked directly with the County Public Works Department sharing responsibility of field data collection and office support, training of County personnel in GPS usage, assisted in GIS Database design, and the preparation of electronic documents required by the County. The PLSS grid was developed at approximately 1 mile spacing, using Static/RTK GPS methods and conventional traverse, and involved 500± PLSS corners in 350± sections. Research of timber company, local surveyor, and County/State survey records was also employed. Section breakdown was calculated to the 1/16 line level, and GIS mapping was provided for the construction of 26,800± parcels using survey COGO techniques in 188 sections, as identified by the project owner.

Benton County GPS Control Survey & GIS Parcel Mapping; Benton County, Washington

White Shield developed a GIS base map of 1090 parcels located within Benton County, WA. Survey control was established on over 40 aerial pre-marks for countywide orthophotography (50 mi x 35 mi), and drawing files were provided named for the Section, Township, and Range of each section constructed. White Shield ensured that all project elements were on their appropriate layers, and that all of the layers followed the project layer listing scheme. Topology was created for the section, and each polygon was created with a block symbol, with attached attributes for each polygon. Polygon block attributes for each section were compared to the County Assessor list for accuracy and completeness.

City of Issaquah GIS Base Map; City of Issaquah, Washington

White Shield conducted surveys of 29 PLSS corners for the GIS base mapping of six sections. Locating and controlling with GPS RTK verified the existing control for uniformity with HARN Network. All PLSS corners were calculated to the 1/4 level.
SECTION 5
ENGINEERING SERVICES
White Shield has been providing quality engineering design services throughout the rural, forested, and metropolitan areas of the Pacific Northwest for over 38 years. Our civil and geotechnical engineers are actively supporting our client’s development goals whether the project is a government installation, commercial development, industrial site, residential structure, or a recreational facility. Our professionals assist our clients with their project environmental and natural resource issues to bring them in compliance with local, state, and federal regulations. We believe that these issues can be managed in a cost-effective and timely manner to the complete satisfaction of all stakeholders. Typical clients include site developers, tribal governments, school districts, federal state, and local municipalities, home owners, petroleum, and food products industries. Our engineering services include planning, design, permitting, environmental compliance, and construction phase services. Our civil, geotechnical, and environmental engineers provide the following services:

- Storm Water Systems
- Retaining Wall Design
- NPDES compliance
- Water Supply Systems

White Shield’s engineering staff has the knowledge and experience to handle the technical challenges associated with civil, geotechnical and environmental engineering requirements for a variety of developments or site improvements. Their individual areas of expertise are outlined in the following table.

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<th>KEY PERSONNEL</th>
<th>Years of Experience</th>
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<th>Geotechnical &amp; Geological</th>
<th>Permitting &amp; Environmental Compliance</th>
<th>Retaining Wall Systems</th>
<th>Foundation Design</th>
<th>Site Development</th>
<th>Sewer Systems</th>
<th>Water Supply Systems</th>
<th>Storm Water Design</th>
<th>Stream Bank Stabilization</th>
<th>Fish Passage Design</th>
<th>Horizontal &amp; Vertical Boring</th>
<th>Parking Lots &amp; Pavements</th>
<th>Storm Water Systems</th>
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SUMMARY OF EXPERIENCE
Lower Red River Meadow Stream Restoration, Grangeville, ID; Nez Perce Tribal Fisheries Watershed Division

The Nez Perce Tribe contracted the White Shield team for the design of a channel meander bend restoration project in the Lower Red River Meadow. The project included the return of the main river channel into two historic river bends and the removal of dredge piles and berms along the river banks to restore fish habitat features and floodplain function during high flow periods. Fish habitat will be restored through hydrologic and hydraulic function characteristic of the natural setting. Plans were developed in a “soft” manner that limits impacts to the site in order to preserve existing floodplains natural functions.

Yakama Nation Casino Site Design, Surveying Geotechnical Studies, Toppenish, Washington; Yakama Indian Nation

White Shield provided complete engineering services on the 45,000 sq. ft. Yakama Indian Nation Casino at Toppenish, Washington. The project is located on 75 acres of trust land adjacent to the Yakama Agency & Cultural Center. The project included site engineering, utility design, road and parking design, waste water pump station, water supply, geotechnical studies, topography and boundary survey, traffic study, and on-site construction inspection.

Nez Perce Tribal Fish Hatchery Civil Engineering, Design Services Stormwater Management; for Fish Pro, Inc for Bonneville Power Administration

White Shield, as a subcontractor to FishPro, Inc. of Port Orchard, Washington, provided civil engineering and site design (grading and drainage) services for the Nez Perce Tribal Fish Hatchery Program. The program consisted of two new fish hatcheries (Sweetwater and Site 1705) and six fish acclimation sites (North Lapwai, Lukes Gulch, Newsome Creek, Mill Creek, Yoosa/Camp Creek, and Cedar Flats). Services include site grading, stormwater management, drainage design, site access improvements, site utility design, potable water supply, and sanitary wastewater disposal.
White Shield provided design and construction support for fishing access sites located on the Columbia River Gorge area within Washington and Oregon. These fishing access sites are being designed to accommodate tribes who have lost access to historical fishing grounds due to dam construction along the Columbia River System. The sites are designed for day and overnight use by fishermen. The designs are made to accommodate camping, boat unloading, moorage, fish preparation areas, picnic areas, and automobile and pedestrian traffic. The site requires development of water supply, wastewater treatment, and access roads through difficult site configurations. White Shield’s responsibilities included the design and permitting of water supply and wastewater disposal facilities. Water supply designs included all pumping, disinfection, and distribution systems and in one case connecting to a public water supply. The water supply systems were designed for both domestic use and irrigation. Wastewater systems design included pump stations and force main design for the connection to a public collection system, as well as septic tanks with pressure distribution drainfields and holding tanks. White Shield was also responsible for identifying necessary permits and permitting of all systems including Washington DOH, local municipality and railroad crossing permits.

Adamsview II HUD Development, Toppenish, WA; Yakama Nation Housing Authority
White Shield is providing construction management and inspection for 30 unit single family home subdivision located on the Yakama Indian Reservation. The project is being built under HUD requirements and includes water, sewer, drainage, streets, and home construction for a total budget of $5 million. The project requires a full time Project and Construction Manager that represents the YNHA’s interest in manage the contractors, force account crews, and multiple utility agencies providing services to the new development. Daily inspections are required to document the efforts and quality of work provided for grading, underground utilities, streets, foundations, and home construction.

Site Civil Design and Stormwater Management for “Friends” Convenience Store, Burbank, WA.
White Shield Inc provided engineering design for new convenience store complex that includes a store building, gas pumps, strip mall stores, and parking. The project was built on a 1.4 acre site. The convenience store is designed with a drive-through food and drink service and with a future pads for a strip mall. The project required design of road improvements and entrances, sidewalks, and stormwater control for the streets fronting the store. The street scape required review and approval by the Port of Walla Walla for compliance with the port’s Master Plan design guidelines.
Engineering Design Projects

**Curlew Job Corps Center, Wastewater Treatment Facility Design, Curlew, Washington; U.S.D.A. Forest Service**
White Shield provided civil engineering services for the design of a wastewater treatment facility. The project is based on a Partial Mixed Aerated Lagoons alternative and was administered in two parts: Phase I included project kickoff, plan development, construction drawings and specifications, construction cost estimates, and permitting. Phase II included services during construction. Design responsibilities include all process, mechanical, electrical, and utilities, as well as earthwork for access roads and lagoons. The existing facility consisted of two septic tanks, a dosing tank and three drainfields. The existing drainfields were failing. The new design included the two existing septic tanks, some of the existing yard piping, two partially mixed aerated lagoons, and pressurized drainfields. Design constraints included simplicity in operation, reliability, and 10 mg/l total nitrogen in the effluent.

**Inchelium-Gifford Ferry Dock Rail System Design Services, Ferry County, Washington; Bureau of Indian Affairs**
White Shield has developed a unique ferry dock ramp that will significantly lower maintenance costs of the ramp, prevent damage to the ferry, and eliminate the need for the ferry to push the ramp itself. The design consists of a dock structure that rides on a fixed rail system. The dock is raised and lowered down the ramp with a motorized winch. Construction of the rail system is partially complete and construction of the dock is scheduled for January 2000. The total project cost is $1.1 million. White Shield, Inc. was selected to perform studies of four alternate designs for the construction of a moveable dock for the ferry operating between Inchelium and Gifford, Washington. The improvements were necessary to reduce maintenance costs and ramp serviceability of the old design, which will not handle large logging trucks, low-boy trailers, or recreational vehicles. The design is complicated by a constantly changing water level in Lake Roosevelt, whereby lake elevations can fluctuate up to 70 feet, and high level of maintenance of manual pushing the dock with the ferry boat.

**Oroville/Osoyoos Border Station Design Development, Oroville, Washington; General Services Administration**
White Shield is providing civil engineering services for the design of the infrastructure of a joint, U.S./Canadian Border Station for Oroville, Washington and Osoyoos, Canada. Project tasks included, site work, survey and design services in relation to subsurface information sufficient to enable the development team to determine cost effective structural design and construction methods to address the foundation, drainage, pavement design, and fill/compaction criteria for the project. White Shield provided pre-design, site design, construction management services, construction monitoring, review and shop drawings. Geotechnical investigations included recommendations based on the geological mapping of the area. The subsurface exploration involved using a rotary drill with 6 soil borings at 20’ depth collected at 2.5 feet and 5 foot intervals on both sides of the border with additional samples taken as needed. In addition, utility options were reviewed for water, sanitary sewer for both animal and human waste(s), and gas options. Survey Services included topographic mapping and research of records for additional parcels for the project to include legal descriptions and a record of survey for property acquisition for the project.
Arikara Celebration Grounds RV Park, White Shield, North Dakota; Mandan, Hidatsa, Arikara Nation

White Shield Inc provided engineering design for a 24 unit RV Park and restroom/shower/laundry facility to support the RV Park and the Pow-Wow ground festivities. The RV Park was designed to accommodate up to 45 foot length recreational vehicles with water and sewer service. Each RV slot was designed to pull-through to avoid backing up large RV’s inside the park. The building was designed to accommodate a large number of visitors for the annual pow-wow at the adjacent dance arbor. The building was designed to accommodate up to 500 people for a 3 day event. The building included separate men’s and women’s shower and changing room, bathrooms, and washroom. A separate laundry facility room was designed to accommodate year around need for laundry facilities for the RV park and community.

Arikara Celebration Grounds Dance Arbor, White Shield, North Dakota; Mandan, Hidatsa, Arikara Nation

White Shield Inc provided engineering design for the new Arikara Celebration Grounds Dance Arbor to accommodate the annual pow-wow. The Arbor was built using concrete pillars around 186’ diameter circle with an 80’ wide path for a pedestrian and vendor mall. The announcer stand is on the western direction that faces the dancers as they enter the arena from the east. The project involved mass grading to build an elevated platform to accommodate the massive size of the circle, and an asphalt paved circular road surrounds the entire facility with exits on three sides. Additional RV power hookups were installed throughout the site to accommodate both RVs, teepee, and tent campers that flood the area during the celebration event.

SPU North Transfer Station Carr Park Grade Design, Lydig Construction, Seattle WA for Seattle Public Utilities

White Shield Inc provided engineering design for engineering design for ADA design of Carr Park sidewalks, basketball court, and other park amenities. The park is owned by Seattle Public Utilities and is built as part of the North Transfer Station. The park has extreme grades and currently doesn’t conform to ADA requirements. White Shield engineers and surveyors designed grades that are no greater than 2% throughout the sidewalks and paving areas to conform to ADA requirements. The project required great care and detail to ensure that all cross-slopes and running grades conform to ADA requirements, especially with the curvilinear shape of the sidewalks, street connections, and landings.
SECTION 6

KEY PERSONNEL
Stuart Fricke, President  
Geographic Information Systems (GIS) Specialist  
Mr. Fricke has over 30 years of professional management experience. He is principal-in-charge of all operations of White Shield, Inc. including corporate policies, administration, finances, business development, and employment. His project management experience includes work associated with research, engineering, environmental, and survey projects throughout the Northwest for Indian Tribes, U.S. Forest Service, US Army Corps of Engineers, various Departments of Transportation, Federal Highway Administration, Bureau of Indian Affairs, Department of Energy, and many other public and commercial interests. Mr. Fricke has demonstrated experience in managing project teams for research studies, engineering projects, and environmental and field studies. He manages projects in the varied roles of project director, project team developer, subcontract manager, cost estimator, contract manager, researcher, or environmental analyst. He has demonstrated technical expertise in the areas of land and water resource planning, economic research, environmental analysis, economic development, and geographical information systems.

Michael Black, P.E. Principal Engineer  
Civil & Geotechnical Engineer  
Mr. Black provides more than 30 years experience in general civil, geotechnical, and environmental engineering; and geohydrology. He also has designed civil work for numerous commercial, municipal, school districts, and residential sub-divisions. As either the owner of an engineering firm, or principal engineer for firms, Mr. Black has been in responsible charge of engineering projects ranging from segmented retaining walls, residential developments, foundation investigations, slope stability, forensic investigations, water well design, characterization of soil and groundwater and environmental risk assessments. Additionally, during his 10 years at Hanford Department of Energy site, he applied various cost/schedule control systems, managed design verification and quality assurance, and engineering changes.

Ben Staehr, P.E.  
Geotechnical Engineer  
Mr. Staehr provides more than 8 years experience in geotechnical engineering. His primary areas of expertise include soil field exploration, footing design, retaining wall design, and slope stability. Mr. Staehr has expertise in commercial, industrial, and residential projects. He performs literature search, soil borings and test pits, geotechnical designs, and writes geotechnical engineering reports and letters. Additionally, he performs field inspections to determine if construction activities meet the design specifications and evaluate actual field conditions and adjust designs as necessary.

Ron Schalla, LG, LHG, LEG  
Professional Geologist/Hydrogeologist/Engineering Geologist  
Mr. Schalla has more than 36 years of expertise in hydrogeologic data collection and evaluation for water resource and ground-water contaminant assessment in the Columbia Plateau, and throughout the United States. In particular his work experience, and major responsibilities have included: management of CERCLA and RCRA projects; development of innovative and cost-effective data collection/analysis methods and remediation technologies; and evaluations in support of hazardous waste management studies. Also, as a relationship and project manager he worked successfully with diverse teams around the U.S. performing cooperative efforts, developing design drawings and specifications, addressing environmental concerns, prepared and reviewed SOPs, FSPs, DQOs, RPOs, QAPPs and other environmental documents, pre-bid and preconstruction kickoff meetings, monitoring of work progress, reporting, conflict resolution, including addressing safety issues. He has worked successfully with diverse groups including regulatory agencies such as EPA, GSA, WSDOE, U.S.DOE, DOD, DNDO, USCBP, and CalTrans.
William Rodgers, LG, LHG
Geologist/Hydrogeologist

Mr. Rodgers has over 38 years of technical and project management experience in the fields of Environmental Consulting (29 years) and Economic Geology (9 years), with over 30 years of Project Management and Client Care experience. His career embraces 29 years’ experience providing Environmental Assessment, Auditing, and Contaminated Site Remediation services to public and private sector clients. He has highly developed skills in areas such as project design and management, report writing and review, drilling, and core logging. His extensive experience in data collection and analysis has earned him a strong reputation for thoughtful and insightful project design and management, and successful attainment of project goals. Mr. Rodgers’ geologic experience includes directing a wide variety of drilling projects using diamond core, Becker hammer, air-rotary, hollow-stem auger, sonic, geoprobe, and hand-held drilling equipment. Mr. Rodgers has himself logged over 40,000 feet of core and/or cuttings retrieved from various environmental projects during the past 38 years.