

Landfill Remediation and Redevelopment

CALIBRE

Our Success Follows Yours

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About CALIBRE

Founded in 1989, CALIBRE Systems Inc. is an employee-owned management consulting and technology services company supporting government and industry. CALIBRE is committed to the success of our clients, and delivers enduring solutions that solve management, technology, and program challenges.

Solutions That Make a Difference

We work in multidisciplinary teams, partnering with you to deliver practical, timely, best value solutions that solve your management, technology, and program challenges and help you achieve your business objectives. This collaborative work style helps produce the results you seek – today and where you want to be tomorrow.

Project Background

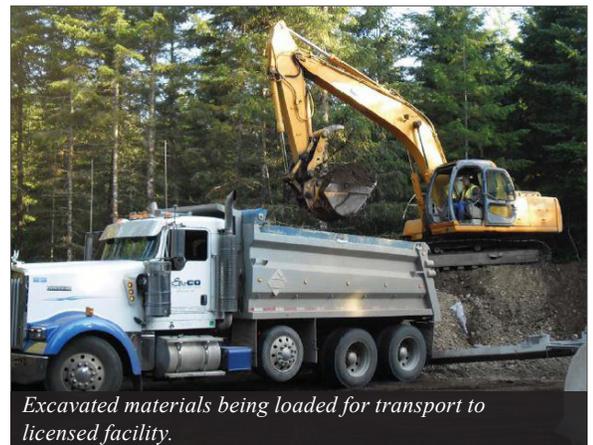
>> *The Hytec and Bordeaux Landfills located in the Black Hills area of western Thurston County in the State of Washington were historically used for the disposal of industrial wastes and municipal refuse. CALIBRE was retained to investigate and remediate the landfills so that the property could be redeveloped for residential reuse.*

Benefits to the Client

>> *This underutilized Brownfields property was transformed into a (future) residential reuse community when CALIBRE obtained a No Further Action (NFA) designation for the property from the State of Washington. We delivered a best-value solution during the remediation of this property, in part by implementing strategic waste reduction measures which resulted in the beneficial reuse of approximately 93% of the non-regulated wastes excavated which was used as cover material in a nearby landfill and on-site backfill used to recontour the site, saving the client significant transportation and disposal costs. CALIBRE used expedited laboratory analysis of confirmation sampling conducted to determine that all contamination exceeding regulatory standards was removed. This allowed CALIBRE to quickly certify full removal of the waste and backfilling was initiated in a compressed timeline. Due to careful inspection and segregation of materials during excavation, the volume of regulated wastes requiring transportation and disposal offsite was reduced from 100% to 7%, resulting in a cost savings of over \$1.5M for our client.*

PROJECT SUMMARY

The project site is located in and around former gravel mines/quarries in the Black Hills area of western Thurston County, WA. The project scope included the investigation, remediation design and removal actions of multiple filled areas that were part of the former gravel mines. Contaminants of concern at the site included lead, cadmium, arsenic, selenium and zinc that were associated with both the overburden and excavated materials and additional fill materials from unspecified sources over the last 70 years. The investigation work plan was developed around a Data Quality Objectives (DQO) process to ensure that sufficient data were collected for each of the anticipated site decisions. The plans included a Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) including SOPs for all field activities. Following the field investigations, an ARARS evaluation was completed to establish benchmarks/criteria for data evaluation. The data evaluation included: human health and ecological risk assessments following MTCA and CERCLA guidelines; collection of background samples and statistical analysis of percentiles and upper tolerance limits to establish the distribution of naturally occurring inorganic elements; identifying nature



Excavated materials being loaded for transport to licensed facility.

and extent of impacted areas; and developing alternatives and cost estimates for removal action alternatives.

The expedited lab analysis allowed CALIBRE to quickly certify full removal of the waste and backfilling was initiated in a compressed timeline.

The removal action work plan included specifications, schedule, permits, O&M plan, QAPP, Health and Safety Plan (HASP), and SAP to address confirmation sampling requirements and long-term monitoring. The removal action work plan also included required procedures for waste management including testing, designation/profiling, and a stormwater/ erosion control plan to meet County and

State requirements. All areas of the site were restored and reclaimed with native vegetation. Some of the relevant features of the removal design and implementation included pollution prevention measures in the remediation design and implemented in the removal action with containment systems for all fuel storage/transfer operations and stormwater/erosion protection control for all work areas. A key waste reduction measure designed and implemented in the removal action included comprehensive and careful inspection and segregation of all materials removed. Using this process, the total regulated waste volume was reduced to less than 7% of the total materials handled. The use of recovered materials included non-regulated waste which used as cover material in the nearest landfill and use of an on-site borrow source for all backfill requirements. These two design considerations resulted in significant energy savings and costs by minimizing the materials transport distance.

CALIBRE prepared a Cleanup Action Plan (CAP) after regulatory acceptance of the RI/FS and then met with local property owners to identify work practices and implementation plans to minimize the impact to their schedules and properties before beginning excavation of landfill wastes. A portion of the site was heavily wooded with mature timber and CALIBRE was able to selectively harvest specific areas for staging and stockpiling of wastes.

Field screening of removed wastes and on-site waste segregation (separating regulated versus non-regulated wastes) resulted in significant cost savings in reduced transport and disposal fees for all non-regulated wastes. In total, 4,900 cubic yards of waste were removed from the two landfills and only 80 cubic yards required disposal as a regulated waste.

The work completed on this project included: 1) Project scoping/planning based on data quality objectives (DQOs) to identify data gaps and develop project work plans and quality assurance plans; 2) Remedial investigation



Backfilled area being prepared for surface contouring and reseeded.



On-site segregation of regulated wastes, allowing for significant transport and disposal cost savings.



Temporary roadway providing continued access for local residents during construction activities.

and feasibility study (RI/ FS); 3) Geophysical survey to delineate the gravel quarry / waste material boundary; and 4) Excavation of the overburden and segregation of the waste material. The site work started as a PA/SI and was initially planned as an Interim Action (the WA Model Toxics Control Act [MTCA] equivalent to an EE/CA). Based on the conditions encountered (drums buried within the overburden and fill), Ecology changed that objective and determined that an RI/FS was necessary. The scope of work completed has included all work plan/planning documents, site investigation, remedial design, permitting, removal action, site reclamation, and post-removal action monitoring. CALIBRE completed the site remedial actions achieving clean closure (No Further Action) on time and under budget allowing the landowner to complete residential development of the site.