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**CLEANUP PLAN
KARDON PARK SITE
DOWNINGTOWN, CHESTER COUNTY, PENNSYLVANIA**

Prepared for:

SOUTHDOWN HOMES, L.P.

**ADVANCED
GeoServices**

Engineering for the Environment. Planning for People.™



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**ADVANCED GEOSERVICES CORP.
West Chester, Pennsylvania**

Project No. 2007-1912-01

April 3, 2008



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Prepared For:

SOUTHDOWN HOMES, L.P.

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**Project No. 2007-1912-01
April 4, 2008**

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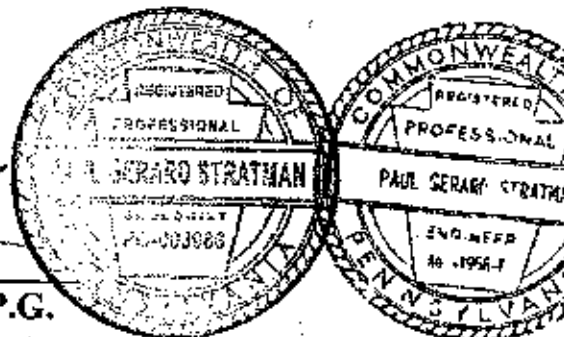




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- B Supplemental Investigation Results and Risk Assessment (Advanced GeoServices, March 6, 2008)
- C Post-Remediation Care Plan



1.0 INTRODUCTION

1.1 GENERAL

Advanced GeoServices Corp. (Advanced GeoServices) has prepared this Cleanup Plan (CP) for the Kardon Park Site (Site) located in Downingtown, Chester County, Pennsylvania (Figure 1). This CP is intended to present the necessary remedial measures and procedures to mitigate risk to residential occupants of the site from direct exposure to the Constituents of Potential Concern (COPCs). A comprehensive description of the Site is provided in the Final Act 2 Report prepared by Golder Associates (July 1999) and the Supplemental Investigation Results and Risk Assessment for Kardon Park prepared by Advanced GeoServices (March 6, 2008). The Final Act 2 Report discusses the establishment of the Site Specific Standards for soil and groundwater for recreational use of the site. The Risk Assessment contained in the Supplemental Investigation Results and Risk Assessment for Kardon Park (Supplemental Risk Assessment) demonstrate that remedial measures are required to mitigate exposure of a site resident to COPCs in the historic fill that underlies the western portions of the Site. A copy of the Final Act 2 Report and Supplemental Risk Assessment were included in the Notice of Intent to Remediate, and are provided here as Attachment A and B, respectively.

1.2 CURRENT SITE CONDITIONS

Currently, the Site is used as a recreational park with a walking path, grass covered areas, and three ponds connected by a mill race fed by the Brandywine Creek. Recreational use of the Site was the exposure scenario for the Site Specific Standards for surface soil developed by Golder in the Final Act 2 Report (July 1999). In that report, Golder identified a layer of "historic fill" ranging in thickness from approximately 2 to 12 feet covering nearly the entire Site to the west of the existing ponds (Figure 2). The volume of historic fill at the Site is estimated to be greater than 250,000 cubic yards. The historic fill is heterogeneous in composition, but it is primarily composed of iron slag, metal, paper and wood products, and plastics. The historic fill is reported to have been generated by industrial facilities in close proximity to the Site.



The Final Act 2 Report identified benzo(a)pyrene, arsenic, iron, lead, mercury, and vanadium as the COPCs. A subsequent change to the Residential Statewide Health Standard for vanadium in soil from 13 mg/kg to 1,500 mg/kg removes vanadium from the above list. No COPCs were identified for groundwater or for soil to groundwater pathways based on the calculated Site Specific Standards as presented in the Risk Assessment in the Final Act 2 Report. In the Final Act 2 Report, Golder concluded that no unacceptable risk to human health or the environment existed for use of the Site as a recreational park, and the Site was granted Act 2 clearance for recreational use.

1.3 PROPOSED FUTURE USE OF SITE

The Borough of Downingtown is the current owner of the site. At this time, Progressive Housing Ventures, LLC and Southdown Homes, L.P. (Developer) propose to purchase and develop the Site as a high density residential development. The residential development is expected to have a positive impact on the economics of the Borough of Downingtown and East Clan Township, as well as, providing additional residential units for the growing community. Residential development of the Site represents an alteration of the exposure scenario for direct contact with soil from the current recreational scenario to a direct contact residential scenario. As demonstrated in the Supplemental Risk Assessment (included in the NOI and provided as Appendix B to the CP), the change in exposure scenarios results in a potential for the historic fill to represent an unacceptable risk to human health for lead, arsenic, benzo(a)pyrene, iron and mercury.

To mitigate the potential for an unacceptable risk from the historic fill, the Developer, in cooperation with the Borough, is proposing to eliminate the potential exposure pathways by placing a soil cap over those areas of the Site underlain by historic fill. The soil cap approach is being proposed because it can be cost effectively integrated with the proposed residential redevelopment.



Capping is considered a conservative and appropriate option for this Site and will ensure both the stability of the historic fill and the elimination of the potential exposure pathways. The cap integrity will be ensured by specified construction requirements, institutional controls, and regular inspection and maintenance of the cap.

Because the Site has already received a release under Act 2 for the Site Specific Groundwater and Soil to Groundwater values, and because the proposed change in land use from recreational to residential will not change the original assumptions for Groundwater exposure and the Soil to Groundwater impacts, the remedial activities proposed in this Cleanup Plan are specific to direct contact with soil. Like the surrounding areas, the proposed development will be serviced by public water.



2.0 LIST OF CONTACTS

This Cleanup Plan has been prepared by Advanced GeoServices, on behalf of Progressive Housing Ventures, LLP and Southdown Homes, LP (Developer). The property is currently owned by the Borough of Downingtown who will be transferring ownership of the property to the Developer in anticipation of the proposed redevelopment. As part of the agreement of sale, Southdown Homes will be the party responsible for implementation of the Cleanup Plan and redevelopment of the properties. The contact information for key personnel is as follows:

Remediator:

Ms. Sarah Peck, Representative of Buyer/Developer
Seven Great Valley Parkway, Suite 210
Malvern, PA 19355
610-935-1100

Current Property Owner:

Mr. Steve Sullins, Borough Manager
Borough of Downingtown
6 West Lancaster Avenue
Downingtown, PA 19335
610-269-0344 x203

Consultant:

Mr. Paul Stratman, P.E., P.G.
Advanced GeoServices Corp.
1055 Andrew Dr, Suite A
West Chester, PA 19380
610-840-9122



3.0 REMEDIAL ALTERNATIVE

3.1 REMEDIAL ALTERNATIVES

The objective of this section is to list, describe and screen potential remedial technologies for historic fill at the Site. In these discussions, the alternatives being evaluated would be applicable to all areas of the Site underlain by fill up to and including the edge of the ponds and mill race to ensure that no areas of historic fill remain exposed at the ground surface following redevelopment of the Site. The following remedial technologies were considered for remediation at the Site. Where a particular technology is obviously inappropriate and not suitable for further retention, a basis for such a determination is also provided.

3.1.1 No Action

No Action is a General Response Action, which does not have any specific technologies or process options. The No Action General Response Action does not include any additional remedial responses for the Site. It was eliminated because the Supplemental Risk Assessment completed by Advanced GeoServices already demonstrated that residential use of the Site could result in an unacceptable risk.

3.1.2 Excavation

Under this type of an alternative, on-site soils above the Statewide Health Standards would be excavated, disposed off-site and the resulting excavation backfilled with "clean" soil. Because of the COPCs are associated with the historic fill the excavation would consist of excavating the historic fill to a prescribed depth and placement of clean soil to create a cap; or excavation of all fill material and backfilling of the entire site with clean fill. Excavation to a prescribed depth of 2 feet would result in an estimated 85,000 CY and as mentioned above, the total estimated volume of historic fill is 250,000 CY. Regardless of which alternative is selected the costs associated with an excavation alternative would outweigh the value of the property rendering redevelopment financially unfeasible. Excavation would also create a hole where now there is



dry land, it would obliterate the ponds and mill race. For these reasons, excavation of historic fill is eliminated as a feasible alternative.

3.1.3 Capping

Capping is a remedial technology typically chosen as a source control action because it can effectively isolate impacted soil, prevent direct exposure, and is adaptable to various Site conditions. Historic fill would be disturbed only to the extent necessary to accommodate the proposed development by minor cutting and filling required to create what would represent the subgrade for the proposed cap. In turn, the surface of the proposed cap would represent the subgrade for the proposed improvements. Because previous evaluations have already shown that soil to groundwater movement of the COPCs is not occurring at levels that are causing unacceptable risk to groundwater the cap does not need to be impermeable. A wide range of readily available materials can be used to construct the cap, but to allow integration of the cap with the redevelopment, the cap fill material must be non-degradable, readily available, cost effective, easily placed and compacted, and capable of supporting proposed improvements. The thickness of the cap should be sufficient to create a protective barrier. Capping will also provide short term and long term protection for human health and the environment when properly constructed and maintained. Long term protection is provided by the cap because it eliminates direct contact with the historic fill. Therefore, use of the Site for residential purposes would be acceptable provided that the integrity of the cap is maintained which will be achieved by implementation of a Post Remediation Care Plan.

3.1.4 Treatment and Stabilization

No treatability studies have been completed as part of the evaluation of cleanup options.

3.2 DETAILED DESCRIPTION OF PROPOSED CAP

Based on the above evaluation, capping is selected as the preferred alternative for this Site. The proposed cap will be integrated with future residential development of the Site. At this time, the redevelopment plans are being finalized and will be required to proceed through the planning and



review processes for the Borough of Downingtown and East Caln Township, as well as, relevant permitting required by the Chester County Soil Conservation District and the PADEP. This means that final grading of the Site is still being prepared and that minor changes to the final location of streets, structures and other improvements can still occur.

Regardless of the potential for minor changes to the final configuration of the redevelopment project, the capping concept can be developed in sufficient detail to allow PADEP review and approval of this Cleanup Plan. Because the intent of the cap is to prevent direct contact by future residents of the Site with historic fill capping requires that all areas of the site underlain by historic fill be covered. The rough graded surface of the historic fill will provide the subgrade for the cap. Utilities and foundations associated with the proposed redevelopment will be installed prior to cap placement to the extent practicable. A map showing the locations of the cap is provided as Figure 3, and a schematic cross section of the finished cap is provided on Figure 4. Once again, capping is only proposed or required in the areas underlain by historic fill.

As shown on the details, the cap is proposed to be a minimum thickness of 18 inches (compacted). The cap materials will be soil fill approved by the Geotechnical Engineer (and meeting the PADEP clean fill criteria) or Pennsylvania Department of Transportation (PADOT) Type 2RC. Cap materials will be placed in lifts on top of the rough graded surface of the historic fill. The historic fill subgrade and the cap will be required to meet density/bearing requirements established by the Geotechnical Engineer, but at a minimum the surface of the historic fill shall be stable under the load of construction equipment and cap materials shall be compacted to a minimum density of 93% standard proctor or 90% modified proctor. Density tests of the cap material will be taken in the field (i.e. with a Troxler™ density and moisture gauge) at a frequency established by the Geotechnical Engineer.

In those area of the Site that will be subject to construction activities associated with the redevelopment that will penetrate the cap and disturb the underlying historic fill (such as during the installation or maintenance of utilities that could not practicably be installed prior to placement of the cap), the Contractor performing the work will be required to adhere to the requirements for cap disturbance and handling of historic fill materials contained in the Post Remediation Care Plan (Appendix C). While development of the Site is still occurring



management of historic fill soils from beneath a previously capped area will involve handling the historic fill using methods that will prevent cross contamination of the surrounding cap areas and placement of excess historic fill in portions of the Site that have not been capped such that the excess historic fill can be incorporated beneath the cap. Such historic fill soils can only be placed in areas established to receive the soils with appropriate erosion and sediment control measures. After completion of capping, excess historic fill materials will require characterization sampling and off-site disposal at an appropriate disposal facility.

A topsoil layer will act as a protective layer for the cap in vegetated areas of the Site and the proposed impervious cover (roads, sidewalks or structures) will act as a protective cover over other areas, but neither the topsoil nor impervious cover is considered a component of the cap. This means that capping will be considered complete within a particular phase when the 18" layer of cap material is in-place.

3.3 WETLANDS MITIGATION

Areas on the Site have been mapped as wetlands (see Figure 2). The capping operations will require the disturbance of the wetland areas underlain by historic fill to produce a contiguous cap. Capping procedures in the mapped wetland areas will follow the procedures described above. The disturbed wetlands will be mitigated on Site at a ratio of 1:1. The areas to be mitigated will not be reconstructed in their current locations. Instead, the Developer is proposing to create a wetland corridor along the west side of Pond 1, Pond 2 and on both sides of the Mill Race between Ponds 2 and 3.

The wetland corridor will be created over areas underlain by historic fill. The cap for the wetlands mitigation areas underlain by historic fill will be a created by excavating the historic fill to a depth 24-inches below the proposed finished grade and backfilling the area with 24 inches of stone and/or soil as specified in the Wetlands Mitigation Plan. The Wetland Mitigation Plan is also expected to specify that select mature trees within the proposed wetland corridor will be preserved if possible. Preservation of mature trees may require excavating less than the 24 inches prescribed for other mitigation areas to avoid extensive damage to the root systems. At these locations, historic fill will be excavated to the top of the root system and a geotextile fabric



will be placed over the roots and then backfilled to the proposed design grades and re-vegetated. A detail for work around trees to be saved is provided on Figure 4. The Wetlands Mitigation Plan will be developed separately from the Cleanup Plan and submitted as part of the Nationwide Permit NP-38 for wetlands disturbance. Remediation required as part of the wetland mitigation will be performed before or during the initial phases of redevelopment and before residential occupancy on the property. Historic fill excavated as part of the mitigation will be utilized as fill soils beneath the proposed cap in other areas of the Site.



4.0 CONSTRUCTION SPECIFICATIONS

4.1 ACCESS CONTROL DURING CAPPING

The Site will be closed to public access during the initial phases of redevelopment and capping. After completion of initial Site preparation activities (such as wetlands mitigation, construction of the through road from Pennsylvania Avenue to Norwood Road) public access may be re-established in those areas that have been successfully capped. Access control will be maintained in those areas where cap construction is incomplete. Measures will be in place to ensure: 1) historic fill material is not transported from the Site by the construction activity or by erosion; 2) proper security of the Site from area residents and visitors; and 3) the protection of the health and safety of site workers and area residents. These measures shall include:

- 1) Clearly marked and secured exclusion zones using high-visibility protective fencing (i.e. orange plastic fencing). The location of the exclusion zone will change as work progresses across the Site but as a basic provision the Contractor will be required to install and maintain protective fencing along areas where the existing ground cover is disturbed and the cap has not been constructed. The protective fencing will be placed along the limit of disturbance line in those areas that represent a possible access point for trespassers. Those areas that do not represent a point of access (such as the edge of ponds or the mill race, do not require protective fencing, but shall be clearly marked with "No Trespassing Environmental Cleanup In-Progress" signs. In addition if stockpile areas are created to receive and temporarily hold historic fill soils, those stockpiles shall also be enclosed with protective fence and signage.

- 2) A decontamination area (stone pad area and pressure washer) at the entrance to the exclusion zone will be used to wash mud and dirt from vehicle tires, buckets, tracks, and rollers. The decontamination pad shall be used for all equipment exiting the exclusion zone that has come in contact with the historic fill. Vehicles entering an exclusion zone that do not travel directly on top of historic fill do not require pressure washing. A boot wash shall be established and maintained at the



ingress/egress point for personnel working within the exclusion zone. Wash water from the decontamination operations will be allowed to infiltrate into the subsoils.

- 3) Access controls will be maintained until the disturbed surface of the historic fill is covered by the proposed cap. Placement of the cap materials shall be performed by placing and spreading the clean cap materials without allowing vehicular traffic directly on the exposed surface of the historic fill. Actual locations of the decontamination areas will be selected by the Contractor based on the phasing and sequencing of work.

4.2 EROSION AND SEDIMENT MANAGEMENT

Erosion and sediment control measures will be a requirement of the Erosion and Sediment Control Plan (E&S Plan) developed as part of the redevelopment project. In addition, an E&S Plan specific to the proposed remediation is provided on Figure 5. Silt fence will be placed at the down slope areas within the boundaries of the protective fencing to prevent erosion and off-site transport of historic fill material. The location of the silt fence will be determined by the Engineer in consultation with the Contractor prior to the start of each phase of construction, but is expected to be approximately as shown on Figure 5. The silt fence will be considered to be holding back potentially impacted sediment originating from the historic fill from the beginning of clearing and grubbing activities until completion of the cap.

Because the silt fence will likely be required in the same locations through the remainder of the redevelopment construction within a particular phase, accumulated silt from behind the silt fence that is or could be from the historic fill shall be removed concurrently with placement of the clean cap soils. Removed sediment shall be incorporated beneath the cap by spreading and compacting as appropriate based on the quantity and consistency of the sediment removed. The silt fence will be inspected by the Engineer following sediment removal to ensure that all potentially impacted sediment has been removed. Based on approval of the Engineer, the silt fence will be allowed to remain in-place (after the removal of the potentially impacted sediment) and be used to contain sediment from the clean capped areas.



The storm water management portion of the E&S Plan will include details concerning construction and operation of retention ponds. The acquisition of a Construction National Pollutant Discharge Elimination System (NPDES) permits concerning storm water discharges will be the responsibility of the Developer.

4.3 VEGETATION REMOVAL

Clearing and grubbing will be required before rough grading and capping can be performed. Clearing and grubbing will be performed in phases as dictated by the proposed development and will be sequenced to minimize the amount of time between the initiation of clearing activities and completion of the proposed cap. Clearing and grubbing methods will be proposed by the Developer and approved by the Engineer but at a minimum shall consist of techniques intended to minimize the potential for cross contamination of previously capped areas and areas outside the current phase of construction. Exclusion zones will be established before the start of construction activities. The removed vegetation will be handled to prevent the inclusion of historic fill soils with the vegetation. Removed vegetation will be stockpiled separate from excavated soil materials and will be disposed of at an approved off Site facility in accordance with local, state, and federal regulations. Root balls and vegetation cross-commingled with historic fill will be stockpiled, sampled and characterized for off-site disposal or disposed on-site beneath the proposed cap at a location approved by the Geotechnical Engineer.

4.4 SURVEYING AND SITE ENGINEERING

The Developer will retain a Surveyor licensed in the Commonwealth of Pennsylvania to perform surveying activities throughout the remedial activities. Vertical and horizontal survey controls in the field will be established prior to the initiation of earthwork activities. No finished grades for the Site are provided as a part of this CP. Finished grades will be finalized by the Developer as part of the land development process. The surveyor will perform a post rough grading (pre-capping) survey to document the finished top of historic fill elevations.



Survey control during the course of construction will be critical to ensure that each area has the specified cap thickness/material over the historic fill materials. Subgrade elevations for the cap (top of Historic Fill) shall be established based on finished design grades in the Land Development Plan approved by the Borough/Township.

4.5 EARTHWORK

Earthwork, including excavation and grading, will be conducted using traditional construction equipment proposed by the Developer. Rough grading of the historic fill materials will be performed to create a subgrade for the cap. Areas of filling will be constructed in lifts and rolled and compacted by a vibratory roller to ensure proper load bearing characteristics as required by the Geotechnical Engineer. This rough graded surface will be surveyed upon completion and used as the subgrade surface of the cap materials as discussed in Section 4.4.

4.6 TRANSITION FROM REMEDIATION TO DEVELOPMENT

It is anticipated that excavation and grading of the historic fill materials and the placement of the cap will be performed in phases. This phased approach will be defined in the proposed residential plan as provided by the Developer and approved by the Borough and Township. Earthwork sequencing will be based on minimization of potential cross-contamination, efficient transport travel routes, and scheduling.



5.0 DEMONSTRATION OF ATTAINMENT

The cap materials will be certified by the Engineer with respect to quality of the cap materials, the placement of appropriate thicknesses of each type of material, and the specified locations of each type of cap material are appropriate for the proposed future residential development. As an additional measure of attainment, long term monitoring and maintenance of the completed cap will be performed in accordance with the Post Remediation Care Plan provided as an attachment to this CP (Appendix C).