TECHNICAL MEMORANDUM

Project No.: 100094

June 4, 2013

To: Libby Goldstein, Department of Ecology

cc: Ron Carpenter, Bremerton School District

From: Doug Hillman, LHG
Principal Hydrogeologist

Re: Summer 2013 Interim Action Work Plan – Additional Cover at Two Locations on School Grounds
Crownhill Elementary School Remedial Investigation
Agreed Order No. DE 7916

The Bremerton School District (BSD) is conducting a Remedial Investigation (RI) at the Crownhill Elementary School (School) Site (Site) in accordance with Agreed Order No. DE 7916 between BSD and the Washington State Department of Ecology (Ecology). The purpose of this Technical Memorandum is to obtain Ecology's written approval for a second interim action (IA) to be completed during the RI, in which additional cover materials will be installed at two locations on the School grounds. This IA will address two locations where marginal soil exceedences are already covered by a clean soil and sod barrier layer at least one foot thick. Ecology has requested that additional cover materials be provided in these areas, to better ensure the long-term integrity of the barrier layer.

Near-Surface Soil Exceedances and Spring 2012 Interim Action

In Spring 2011, Site soils were sampled on a 50-foot grid spacing at three depth intervals (0 to 3 feet, 3 to 9 feet, and 9 to 15 feet), and the samples were analyzed for contaminants of potential concern.

Concentrations in excess of proposed soil cleanup levels were detected in the 0- to 3-foot depth interval at the following locations on the Bremerton United Methodist Church (Church) and School properties (refer to Figure 1):

- In the northwest corner of the Church property (the location of the Spring 2012 IA, described below), where multiple contaminants exceeded proposed cleanup levels;
- On Church property south of the Spring 2012 IA area, where arsenic was detected at 1.1 times the proposed cleanup level;
- On the eastern School property boundary, where lead was detected at 2.7 times the proposed cleanup level;
- On School property northeast of the Spring 2012 IA area, where lead was detected at 2 times the proposed cleanup level; and

- On School property north of the portable classroom, where lead was detected in two adjacent grid locations, at 1.6 and 1.7 times the proposed cleanup level.

Supplemental sampling of soils in the 0- to 1-foot depth interval was then conducted on a 25-foot grid spacing at all of the above locations except the eastern School property boundary (where pavement provides protection against potential direct contact exposures). Supplemental sampling results indicated that soils in the 0- to 1-foot depth interval exceeded proposed cleanup levels only in the northwest corner of the Church property. Those results provided the basis for conducting the Spring 2012 IA. That IA achieved site-wide protection against direct contact exposures by removing impacted soil to a 1-foot depth, installing a geotextile fabric, and constructing a clean soil and sod barrier layer at least one foot thick. As shown on Figure 1, the roughly 5,800-square-foot area addressed by the Spring 2012 IA is located primarily on Church property, with its northern edge extending approximately 15 feet north onto School property.

Areas to Receive Additional Cover in Summer 2013

Ecology has requested that additional cover be provided northeast of the Spring 2012 IA area and north of the portable classroom to better ensure the long-term integrity of the barrier layer at those locations. At these two locations, previous sampling detected lead in soil above the proposed cleanup level in the 1- to 3-foot depth interval.

We understand Ecology does not require additional cover in the vicinity of the lead exceedance on the eastern School property boundary because that area is paved; nor is it required in the vicinity of the arsenic exceedance south of the Spring 2012 IA area due to the marginal nature of that exceedance (1.1 times the proposed cleanup level) and the fact that it is not located on School property.

The red hatching on Figure 1 indicates the proposed minimum coverage areas for the two additional cover locations. The proposed minimum coverage areas comprise approximately 2,400 square feet northeast of the Spring 2012 IA area and 4,900 square feet north of the portable classroom.

Proposed Cover Components

Since the upper 1 foot (minimum) of soil already complies with proposed cleanup levels in the two additional cover areas, no soil will be removed in the Summer 2013 IA. Instead, a geotextile fabric (which does not reduce water infiltration but provides a “marker” layer that reduces the potential for exposure to underlying contaminated soils) will be placed directly on the existing sod surface in the minimum coverage areas shown on Figure 1. Additional cover materials will then be placed to achieve a minimum 1-foot thickness above the geotextile fabric. Conceptual design sketches for the two areas are provided on Figures A-1 and A-2. The finished ground surfaces will consist of landscaping, sod, or a combination of the two. Thus, upon completion of the Summer 2013 IA, cover components in these two areas will include the following (bottom to top):

- A minimum 1-foot thickness of pre-existing “clean” soil;
- A layer of geotextile fabric;
- A minimum 1-foot thickness of imported materials (primarily soil); and

- Sod or landscaping.

A hard surface such as concrete or asphalt pavement was also considered for placement in lieu of the cover components discussed above. However, a hard surface is not feasible due to additional storm water management requirements the increase in hard surface area would trigger.

Long-Term Maintenance of Cover

Institutional controls will be implemented to ensure the long-term integrity of the IA. These will likely include an environmental covenant on the School property that requires periodic inspection and maintenance (I&M) of the cover features, with reporting to Ecology. Additional information on planned institutional controls will be provided in the site Cleanup Action Plan (CAP).

Schedule

The Summer 2013 IA is scheduled to be completed prior to commencement of the 2013/2014 school year in September 2013.

Permitting

Since work is being completed under an Agreed Order, a grading permit is not required. However the action is subject to State Environmental Policy Act (SEPA) review. BSD is the lead agency for the SEPA process and the completed checklist is provided under separate cover. BSD has determined the Summer 2013 IA as proposed does not have a probable significant adverse impact on the environment, and is prepared to issue a "determination of non-significance." Following Ecology's approval of the Summer 2013 IA as described above, BSD will advertise their SEPA review for public comment.

Attachments:

Figure 1 – Proposed Minimum Coverage Areas, Summer 2013 Interim Action
Figure A-1 – Conceptual Design - Additional Cover North of Portable Classroom
Figure A-2 – Conceptual Design - Additional Cover Northeast of Spring 2012 Interim Action Area

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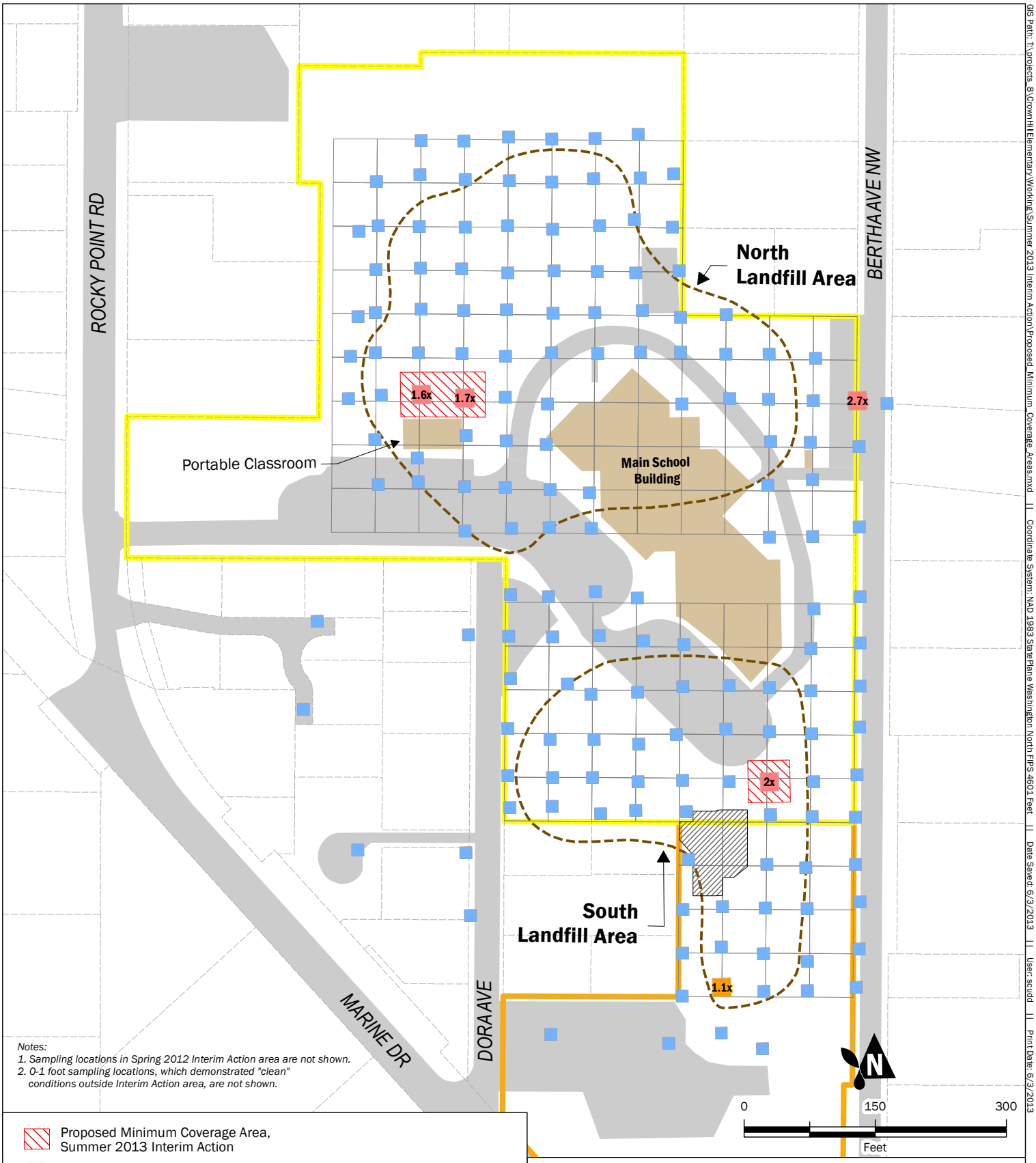

Notes:
1. Sampling locations in Spring 2012 Interim Action area are not shown.
2. 0-1 foot sampling locations, which demonstrated "clean" conditions outside Interim Action area, are not shown.

- Proposed Minimum Coverage Area, Summer 2013 Interim Action
- Sample Grid
- Spring 2012 Interim Action Area

Soil Sampling Locations (0-3 foot depth interval)

Cleanup level exceedance factor
- 1.6x — Lead cleanup level exceedances
- 1.1x — Arsenic cleanup level exceedances
- No cleanup level exceedances

- Interpreted Extent of Landfill Activity
- Parcel Lines
- Bremerton School District Property Boundary
- Bremerton United Methodist Church Property Boundary
- School Building Footprint
- Pavement

Proposed Minimum Coverage Areas Summer 2013 Interim Action

Crownhill Elementary School
Bremerton, WA

Aspect CONSULTING	JUN-2013	BY: DAH/PPW	FIGURE NO. 1
	PROJECT NO. 100094	REV BY: SCC	

GIS Path: T:\projects_8\Crownhill Elementary\Working\Summer 2013 Interim Action\Proposed_Minimum_Coverage_Areas.mxd || Coordinate System: NAD 1983 State Plane Washington North FIPS 4601 Feet || Date Saved: 6/3/2013 || User: scudd || Print Date: 6/3/2013

Aspect Consulting
June 2013

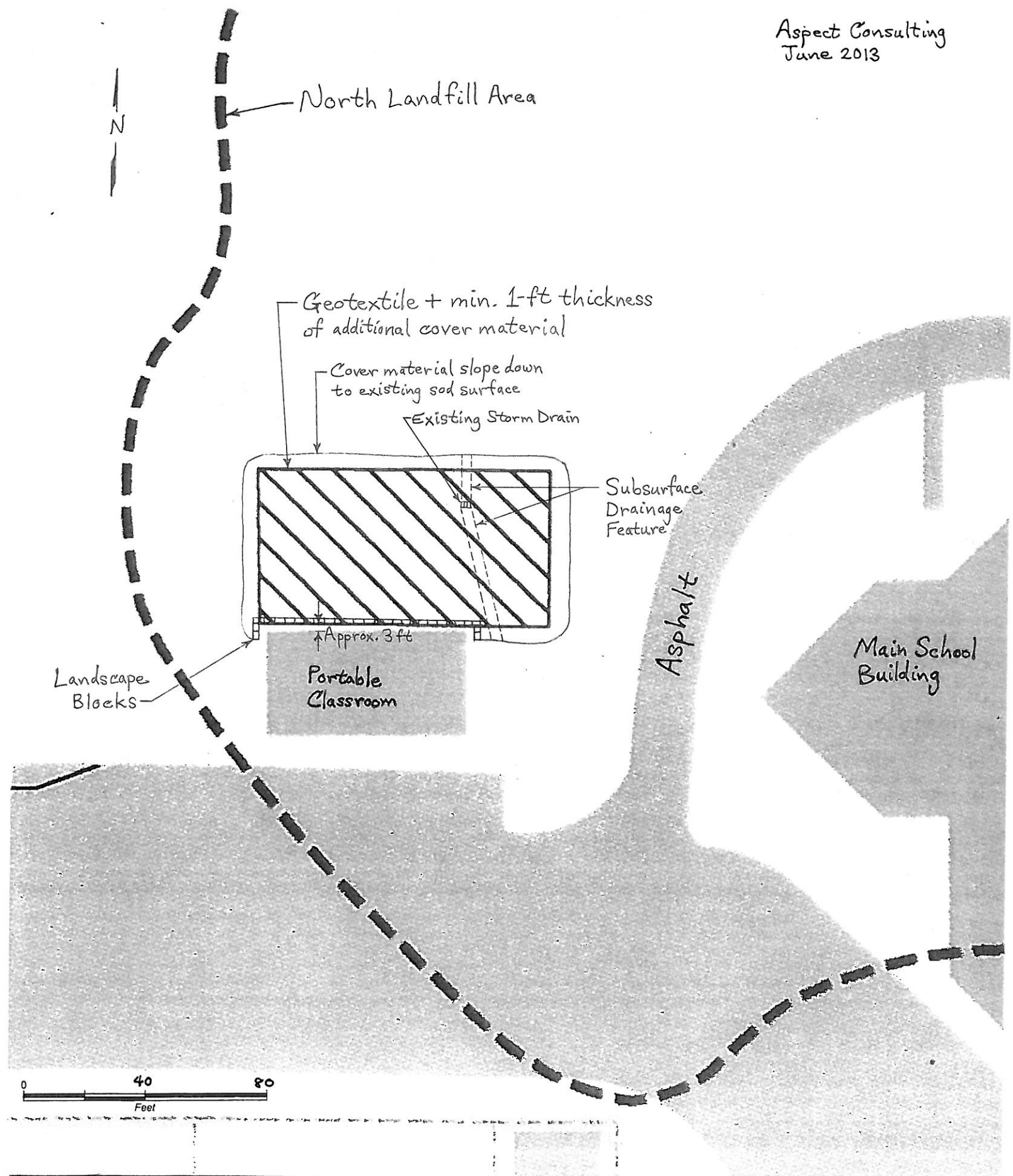

Figure A-1
Conceptual Design - Additional Cover North of Portable Classroom
Summer 2013 Interim Action, Crownhill Elementary School

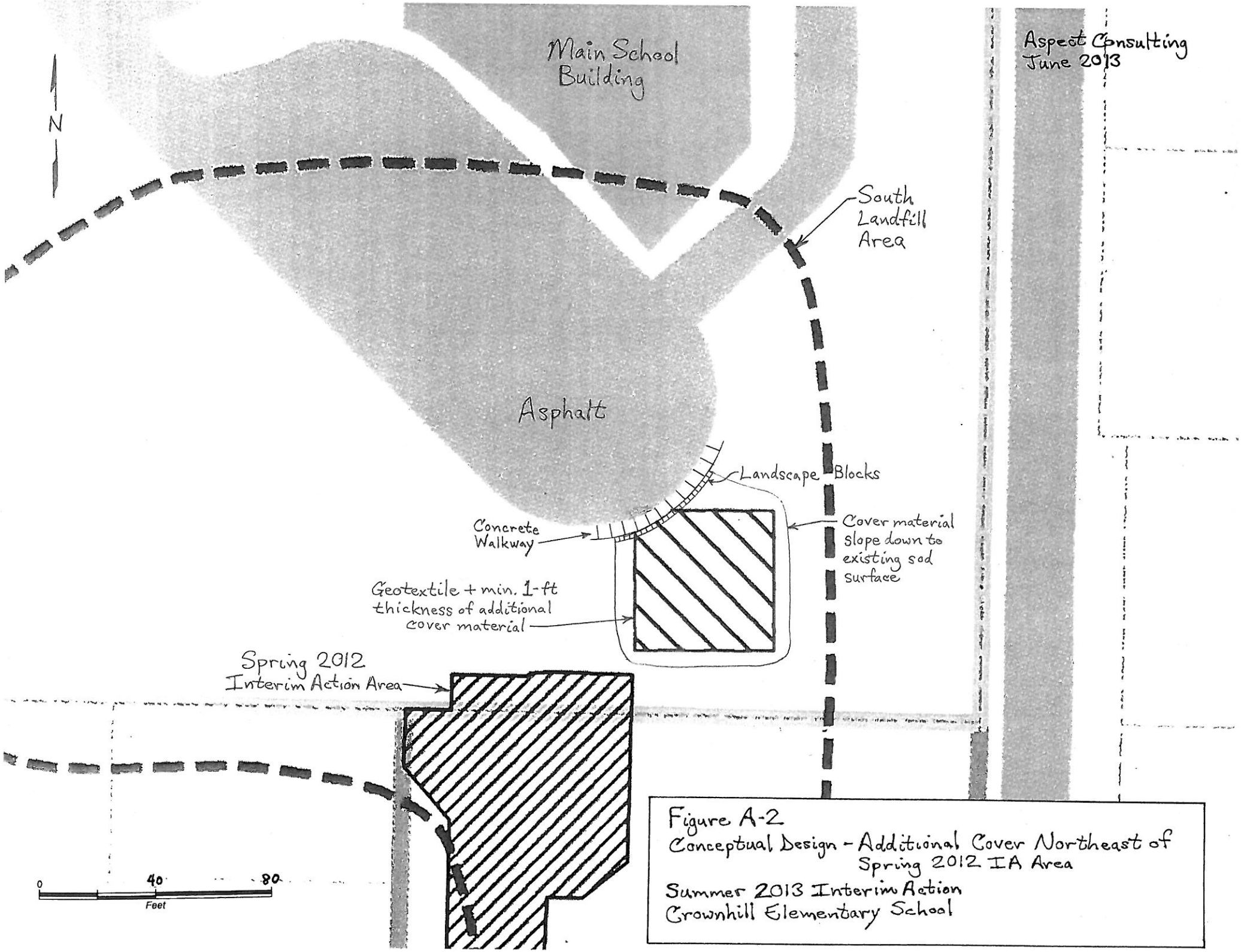

Figure A-2
Conceptual Design - Additional Cover Northeast of Spring 2012 IA Area
Summer 2013 Interim Action
Crownhill Elementary School