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October 11, 2017

Mr. Andrew Gunnoe
Deputy County Manager & Fiduciary Manager
Kanawha County Commission
409 Virginia Street East
Charleston, WV 25301

Re: Multi-Sports Complex
Shawnee Golf Course

Dear Mr. Gunnoe:

Enclosed please find a report detailing tasks to be done at the proposed Multi-Sports Complex near Dunbar, WV.

Fly Ash Areas

Terradon Corporation has delineated fly ash disposal areas based on historical records and recent geotechnical investigations by American Geotech, Inc. I have also reviewed the borehole information conducted by the Union Carbide Corporation as part of the environmental study. The existing soil cap on the fly ash/bottom ash consists of 1 foot to 4.5 feet thick silty clay and sandy clay.

Based on the above information, a minimum of 3 feet soil cap must be maintained throughout the fly ash/bottom ash fill areas. This should be done by not cutting into existing soil cap where thickness is at least 3 feet, and filling areas with clay where existing soil cap thickness is less than 3 feet. It appears that the suitable clay soil may be available on site for fill material.

Golf Course & Greens Area Top Soil

The fungicides, insecticides and pesticides are only applied to the greens comprising of approximately 2 acres at the Shawnee Golf Course. None of these substances are on USEPA - Resource Conservation and Recovery Act (RCRA) list of Hazardous Wastes. The amounts applied annually in most cases are very small. The half-life of the active ingredient varies from ½ hour to 1 year. These chemicals are also used on edible crops, lawns, gardens and golf courses.

Considering the half-life, biodegradability, small annual amount and application on only 3% of the areas in the golf course, further testing of the soils is not necessary. Any excess top soil removed from the golf course may be used for fill material elsewhere as long as the minimum 3 feet cap of existing soil material is kept throughout the proposed Multi-Sports Complex.

- ENGINEERS
- DESIGNERS
- SURVEYORS

- ENVIRONMENTAL
- MUNICIPAL WASTE
- INDUSTRIAL WASTE
- STORMWATER/SCP
- NPDES PERMITS
- CIVIL DESIGN
- LAND PLANNING
- LAND SURVEYS
- DIGITAL MAPS
- HYDROLOGY
- ENVIRONMENTAL SITE ASSESSMENT
- GPS/GIS
- CONSTRUCTION MANAGEMENT

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Existing Ponds Decommissioning

1. The pond closer to the swimming pool contains approximately 2,422,000 gallons and the pond closer to the Kanawha River contains approximately 932,000 gallons according to the information provided by American Geotech, Inc. Fish from the ponds shall be harvested and relocated to the big pond near the Juvenile Detention Center.
2. Water from the existing ponds may be pumped or siphoned off at a rate of less than 1,000 gpm into the existing storm sewers. Care shall be taken not to discharge any pond bottom sludge/muck into the storm sewers.

The sludge/muck in the bottom of the ponds needs to be mixed with lime at a rate of 2 pounds per square feet for disinfection.

The bottom of the ponds then need to be filled with shot rock with a minimum clay cap of 3 feet on top of the rock. The area can then be covered with topsoil, seeded and mulched.

Proposed Utility Trenches

Care shall be taken not to disturb fly-ash layers below the existing soil cap. However, if necessary to disturb the fly-ash for installation of any utilities, the bottom and side walls shall have a minimum 1 foot clay layer and a minimum of 2 foot clay layer on top of the utility lines. The area can then be covered with topsoil, seeded and mulched.

Please call me at (304) 342-7168 if you have any questions.

Very truly yours,
S & S ENGINEERS, INC.

Ashok M. Sanghavi, P.E., DEE, QEP
Senior Engineer
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