



**GeoInsight®**

Environmental Strategy & Engineering  
*Practical in Nature*

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## MEMORANDUM

TO: Dan Bisson, Team Design, Inc.  
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FROM: Mike Penney, GeoInsight, Inc.

RE: **LANDFILL REUSE PRELIMINARY SUMMARY  
JONES AVENUE SITE REDEVELOPMENT  
NEW PORTSMOUTH MIDDLE SCHOOL  
PORTSMOUTH, NH**

DATE: August 22, 2006

GeoInsight Project 4684-000

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As requested, GeoInsight, Inc. (GeoInsight) prepared this memorandum to describe a preliminary evaluation of the potential reuse of the closed Jones Avenue Landfill (the site) owned by the City of Portsmouth (City). The evaluation was performed in consideration of the potential selection of the property, including the landfill, as a site for a proposed new Middle School for the City.

GeoInsight has significant expertise in the area of landfill design, permitting, operation, closure, remediation, and assessment. Based upon our history of involvement with and understanding of landfills, and our corporate desire to promote sustainable development, GeoInsight began researching the potential for landfill reuse in late 1990s. We quickly discovered that the northeast was one of the few areas where landfill reuse was not common place. Because of the densely settled nature of many northeastern communities, new land was at a premium and many municipalities already had closed landfills that were unproductive land, it made sense to us that reusing landfills would return value to the land. Additionally, reuse would allow future maintenance performed on athletic fields to also serve as the maintenance for the landfill caps.

In early 2000, GeoInsight became involved with the Town of Goffstown to assist with their landfill closure, because they were planning on implementing some type of landfill

reuse scenario. We then completed a successful design of a closure that included athletic fields above the landfill cap and performed oversight of the construction. The design resulted in significant interaction with the New Hampshire Department of Environmental Services (NHDES) Waste Management Division (WMD), whose staff worked with us to identify basic landfill reuse criteria that could be applied at other landfills in the State.

Nearly concurrent with the closure of the Goffstown Landfill, GeoInsight was approached by the City of Portsmouth to evaluate the reuse of the Jones Avenue Landfill for possible recreational athletic fields. It was through this process that GeoInsight became familiar with the location and layout of the Jones Avenue site, surroundings, and details regarding the historic operation of the landfill, its closure, and associated on-going monitoring and maintenance. GeoInsight engaged in very preliminary discussions with the NHDES at that time regarding the site and identified that the NHDES would not be opposed to reuse of the Jones Avenue landfill, provided such reuse was in keeping with the reuse criteria. GeoInsight then performed a preliminary assessment of a number of conceptual athletic field layouts for the City and identified additional steps that would likely have to be taken if design activities were to be pursued. The City did not decide to move forward with reuse of the site at that time (2002), but was made aware of the site's potential value by GeoInsight's preliminary work.

In early 2006, while researching renovation, expansion, or relocation for the City's Middle School, one of the potential building sites that was identified for a new school was the Jones Avenue site. The site was favorable for a number of reasons and was regarded as a strongly favorable location if renovation or expansion of the existing school was not feasible. While researching the property with City officials, Team Design was made aware that some preliminary landfill reuse assessment had been performed by GeoInsight. Team Design then invited GeoInsight to take part in the project team with Appledore Engineering, Inc. (AEI) because of our experience with the site.

GeoInsight's participation on the team included meetings to discuss landfill reuse topics, referencing similar projects done in Goffstown and Nashua that the NHDES reviewed, providing conceptual ideas for athletic field layouts to AEI, and then arranging a meeting with the NHDES WMD to renew discussions regarding reuse of the landfill.

The focus of the meeting with the NHDES was to present the possibility of reuse of the landfill in combination with development of outlying areas as a school. NHDES concurred that there was precedent that the redevelopment could work provided the design took into account reuse criteria. Different aspects of landfill reuse were discussed, including new athletic fields, parking areas, roadways, and other low intensity use. The NHDES agreed in concept that these would be plausible scenarios for the site.

It is important to note that not all landfills are readily suitable for reuse. Landfills containing relatively fresh waste, high concentrations of organic matter, and/or very deep waste can be problematic due to high gas production and settlement. Similarly, landfills that received bulk chemicals (such as drums and sludges) from industrial activities may also present special problems due to the need to control gas and ground water migration.

The Jones Avenue landfill, however, is relatively ideal for reuse because of its age, the presence of ash (which is quite stable), and a significant monitoring history indicating that settlement, gas production, and ground water quality are not significant issues at the site.

Reuse of a landfill, including the Jones Avenue landfill, will require consideration of the following technical criteria, which are each, in and of themselves, relatively straightforward engineering details. Primary issues identified to be applicable to the Jones Avenue site include:

- evaluating whether the landfill generates gas, assessing the nature of the gas, and providing provisions to intercept potential gas migration between the landfill and a new school building;
- maintaining the integrity and function of the cap over the existing waste to prevent contact, providing minimum separation distances between a new surface and the cap, and providing provisions for point loads above the cap, if applicable;
- assessing the potential for settlement or subsidence of the landfill, and accommodating such potential into the new design;
- incorporating the new reuse design configuration into an overall geotechnical stability evaluation of the landfill site; and
- maintaining control of surface water runoff to minimize the potential of existing ground water quality degradation.

Based upon GeoInsight's assessment of the landfill site and proposed use, we believe that the Jones Avenue landfill is a favorable site for redevelopment, and that such reuse would be complimentary to overall site development.