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MEMORANDUM

Date: April 22, 1999

To: Robert F. Troiano

From: Donna Pallister, P.E., L.S.P., L.E.P.

Subject: Review of Letter dated April 16, 1999 from Latin American Professionals Organization of Rhode Island, Inc. (OPLARI) to Gertrude Blakey, Providence School Board

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As you requested, we have reviewed the technical information in the above referenced letter. Many of the comments and recommendations in the letter have already been addressed in the Site Investigation Report, which will be available for public review after the Rhode Island Department of Environmental Management (RIDEM) completes their review. Responses to specific points in the letter are listed below:

Page 1: "it is a known fact that liner system constructed in and around any landfill will not last forever and will therefore place a burden on future administration and generation" "We want to remind you that repair of such liner is almost impossible, when the liner has failed."

This site was not equipped with a liner when it was used as a landfill. Liners are required to be installed in new landfill cells, however, they were not required or installed at the time this landfill was in operation. The purpose of a liner is to prevent liquids or precipitation associated with the solid waste, and the solid waste itself, from coming into contact with underlying groundwater. At this site, although no liner was installed, groundwater sampling and analysis has indicated that no adverse impact to groundwater has occurred.

In summary, the site does not have a liner, a liner is not required to be installed, and future maintenance of a liner will not be required.

Page 2: Table of Landfill Gas Composition

This table provides general typical constituents of concern and landfill gas concentrations for landfills. Soil gas at 12 locations at this site has been analyzed for methane, carbon dioxide and oxygen to determine the site specific conditions. Methane was detected in only one of the 12 samples, at 0.2 percent. Carbon dioxide was detected in 8 of 12 samples, but the highest concentration, 5.2 percent, was much lower than the typical values presented in the table. The on-site monitoring found oxygen values to ranging from 12.8 to 20.5 percent, indicating that oxygen is available for aerobic degradation of solid waste in the landfill.

Soil gas samples collected from the site were also analyzed for volatile organic compounds. The analytical method used is capable of identifying and quantifying 39 compounds down to a detection limit of one half of a part per billion by volume. The 39 compounds analyzed for include common industrial solvents and petroleum related compounds. Although some compounds were detected, ATC found that the concentrations were below health based standards published by the Connecticut Department of Environmental Protection (RIDEM does not have any standards for soil gas). We

also compared the concentrations to OSHA standards for workplace air, and found that the concentrations of all compounds detected were below the OSHA standards.

Although sampling and analysis did not detect elevated concentrations of the landfill gas constituents, a soil gas collection system is proposed to be installed beneath the school as a precaution. The soil gas collection system will be designed to intercept any landfill gases, and prevent them from entering the schools. The soil gas collection systems will be equipped with monitors to detect landfill gases, and to ensure that the system is working properly. Therefore, students and other personnel in the schools will not be exposed to even the low concentrations detected in soil gas at the site.

Page 3, Item 1) the findings of the Risk Assessment Study which will evaluate human and environmental risk

ATC's Site Investigation Report includes a risk assessment. ATC performed their risk assessment by comparing the results of the investigation to standards derived by the Rhode Island Department of Environmental Management (RIDEM) based on human health risks. The risk assessment was performed in accordance with regulation 8.0 Risk Management of the RIDEM *Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases*.

The Risk Assessment concluded that some risk existed if the site was left untouched, but that the risks could be eliminated by the proposed remedy.

Page 3, Item 2) Findings of the United States Environmental Protection Agency (USEPA) site evaluation.

USEPA has not reviewed the data for this site because the site is not currently in any of the USEPA administered programs. The site is regulated by the RIDEM, who has reviewed the investigation and proposed construction for the site.

Page 3, Item 3) Fate and transport study findings.

ATC evaluated migration pathways in the Site Investigation Report to evaluate fate and transport of materials found at the site. The fate and transport of contaminants was considered in the design of the remedy for the site.

Page 3, Item 4) The Contents of a Corrective Action Plan, which will present remediations options and costs.

ATC's Site Investigation report includes an evaluation of remedial alternatives. Three options were evaluated, and the preferred option was the construction of a cap, and installation of a soil gas collection system beneath the buildings. RIDEM has concurred that this is the preferred remedial alternative.

Page 3, Item 5) The air quality in and around the closed landfill.

The air quality has not been evaluated to date. Without action, there are no controls or monitors in place to mitigate any affects of the landfill on air quality. After the cap and soil gas collection system are installed, any emissions from the landfill will be controlled and monitored, and subject to regulations limiting emissions to safe levels.

Page 3, Item 6) The effect on wild biota, particularly plants and animals.

The undeveloped site did not contain any valuable wildlife habitats. It was also not considered a valuable open space or recreation area. After the site is developed, wild plants and animal habitat will be eliminated.

Page 3, Item 7) The levels of methane and volatile organic chemicals being emitted.

As noted above, this has been evaluated. The concentrations of methane and volatile organic chemicals being emitted was found to be very low. As a precaution, however, construction plans include a soil gas collection system beneath the two schools to prevent any future emissions from entering the school buildings.

Page 3, Item 8) Whether the gas collection system effectively and comprehensively capture the methane and Volatile Organic Compounds (VOCs) if one was installed.

As noted above, measurements at the site detected only very low concentrations of methane and VOCs. However, a gas collection system is proposed to be installed under both buildings, along with perimeter monitoring wells to monitor for migration of methane. The systems are being designed to prevent migration of soil gas into the site buildings. Monitors will be used inside the site buildings to ensure that the soil gas collections systems work as designed.

Page 3, Item 9) The exact cost and sources of funds for recycling the removed waste.

Solid waste is proposed to be removed from the south end of the site prior to construction of the elementary school. Due to the age and condition of the waste, recycling is not likely to be feasible. Instead, we anticipate that the waste material will be transported to the Rhode Island Central Landfill for disposal as a solid waste. The cost will depend on the volume of waste material removed and the tipping and transportation cost. The cost will be part of the construction cost for the schools and will be included in the bonds used to finance the school construction.

Page 3, Item 10) What the neighbors expect from the schools and remediation of the closed landfill.

Several public meetings have been held to discuss this issue and neighbors concerns are being considered in the project design. Please note that the proposed school site is currently vacant land which is platted as approximately 100 individual lots, with numerous owners. It is unlikely that the site conditions would improve any time soon if the schools were not being constructed at the site.

Page 3, Item 11) The historic picture of the adjacent neighborhood.

ATC reviewed historical aerial photographs for the site and vicinity. Copies of some of these aerial photographs as well as other information about the history of the site and vicinity are included in the Site Investigation Report.

Page 3, Item 12) Whether the proposed site was cited by Regulatory Agencies.

ATC reviewed files at RIDEM regarding the regulatory status of the site. The file information indicated that between 1970 and 1975, The Rhode Island Department of Health, Division of Air Pollution Control, received complaints about odors at the site. There was also a complaint about rats, and concerning the dumping of a six foot long shark.

In addition, RIDEM investigated the site and performed sampling to evaluate allegations of dumping of auto fluff at the site.

Page 3, Item 13) The effect of installing lined cells on the landfill.

As noted above, no liner was installed prior to deposition of solid waste at the site. Installation of a liner under the solid waste already buried would require digging up the waste, and therefore would not be practical.

Page 3, Item 14) When and how the lives of our children exceed the costs of proposed schools.

We can not and would not attempt to put any kind of dollar value on any human life. The purpose of the proposed remedy for this site is to prevent children and all other users of the site from ever coming in contact with the solid waste at the site or any byproduct of the solid waste (soil gas). As long as people do not come in contact with the material, it can not harm them. The proposed remedy will prevent contact with skin,as well as ingestion or inhalation of any potentially hazardous materials.

Page 4, Item 15) The effect of removal of the waste on the landfill and the composition.

In evaluating remedial alternatives for the site, ATC evaluated the option of removing the solid waste from the site. They estimated the cost of this remedial alternative at $25,000,000, and therefore determined that it was not a feasible option. ATC estimated that there is 200,000 cubic yards of solid waste at the site. Excavating and transporting this material from the site would be difficult and could result in odors and noise which would affect neighbors. Transportation of the that quantity of material would require approximately 10,000 truckloads to leave the site, again, with a possible adverse impact to the surrounding neighborhood.