# *MEMORANDUM*

TO: Ms. Miriam Siegfried, P.E.

FROM: Frederic J. Smith, P.E.

DATE: June 22, 2006

**RE: Lagoon No. 1 Sludge Removal Quantity**

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ms consultants has reviewed the aerial survey performed by Aerocon Photogrammetric Services, Inc. on May 23, 2006 for Lagoon No. 1. Subsequent volume calculations performed by ms determined that Kokosing Construction Company removed & disposed of 309,717 CY. The methodology of determining this volume is described below.

- The existing top of sludge surface was based on the June 7, 2005 aerial survey, which was performed at the completion of Contract No. 1030, Part 1. The finished bottom surface was based on the previously stated May 23, 2006 aerial survey. The corresponding volume between these two surfaces is 304,689 CY.

- The following adjustments were performed to the May 23, 2006 aerial survey:
  - Five depressed areas retaining surface water were present within this aerial survey. The depth of water of these areas were measured in the field on May 23, 2006 by the Contractor & a ms representative. These depths along with an assumed side slope of 2H:1V were utilized to calculate an additional sludge volume of 4,704 CY.
  - One irregular depressed area holding surface water within the northeast corner of Lagoon No. 1 was field measured by the Contractor & a ms representative on May 23, 2006. This area was not delineated in the aerial survey because Aerocon could not accurately define the random surface water lagoon basin interface. This area, calculated similarly to the previously stated water area, represents an additional sludge volume of 2,459 CY.

- The following reductions were performed to the calculated volume between the two aerial surveys.
  - The construction debris removed & disposed reduced the sludge volume by 700 CY.
  - The trash & debris removed & disposed reduced the sludge volume by 1,435 CY.

In accordance with Section 02100 Sludge Removal of the Contract Specifications, the total calculated volume of sludge removed & disposed from Lagoon No. 1 is 309,717 CY.

The Contract quantity of sludge removal & disposal for Lagoon No. 1 was 271,844 CY at $8.75 per cubic yard. The Contractor has been awarded payment of $1,359,220.00 for removing the entire as-bid quantity. The full contract amount was awarded to the Contractor upon completing the sludge removal from Lagoon No. 1 and providing elevations of the lagoon basin that were below those shown within the Contract Drawings. Consequently, the Contractor is owed an additional $331,388.75 for removing an additional 37,873 CY.

The remaining force account, which will be adjusted on Change Order No. 4, which currently has a balance of approximately $256,323.82, which leaves a remaining balance of $58,570.97 owed to the Contractor.

The difference between the Contract quantity of sludge removed & disposed from Lagoon No.1 and the actual quantity of sludge removed & disposed can be attributed to increased depths across the northwest basin of the lagoon, additional sludge encountered adjacent to the electric poles along the southern boundary and additional sludge that was quantified as construction debris.

If you have any questions or wish to further discuss the final sludge removal quantity, please feel free to contact Shiloh Archer or myself.