
APPENDIX F— DRA BUILDING LOCATION REVIEW

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March 20, 2012

VIA PRIVATE CARRIER & EMAIL

Mr. Wayne S. Pennell
Deputy Executive Director
Operations and Maintenance
Maryland Aviation Administration
Terminal Building, Third Floor
P.O. Box 8766, BWI Airport
Baltimore, Maryland 21240-0766

**Re: Martin State Airport, Middle River, Maryland
Request for on-Airport Dump Road Area Treatment Building Location
and Dump Road Area Interim Remedial Action Proposed Plan Review**

Dear Mr. Pennell,

As you know, Lockheed Martin Corporation (LMC) has proposed an Interim Remedial Action (IRA) treatment system to intercept and treat a plume of volatile organic compound (VOC)- impacted groundwater associated with the former Dump Road Area (DRA) landfill at Martin State Airport, in order to provide containment and preventing the migration of impacted DRA groundwater into Frog Mortar Creek (FMC). Due to the need to construct the treatment system as soon as possible, and the lack of suitable off-airport locations, LMC is requesting that the Maryland Aviation Administration (MAA) approve the construction of a treatment building on the footprint of the Dump Road landfill itself, on MAA's Martin State Airport property.

We have also attached a copy of the IRA Proposed Plan. LMC initiated public review of the DRA IRA by issuing the Proposed Plan at our public information session on February 8, 2012. This Proposed Plan proposes the preferred alternative (interim) remedy first introduced to MAA in October, 2010, in the draft document titled, "*Interim Remedial Action – Feasibility Study for the Groundwater Operable Unit at the Dump Road Area Site at Martin State Airport.*"

The public comment period for the Proposed Plan concluded March 8, 2012. Under separate cover letter, Lockheed Martin will provide MAA with the public comments that were received. This Proposed Plan has also been submitted for formal Maryland Department of the Environment consideration and review. The favor of MAA's reply with any comments about the Proposed Plan would be appreciated by May 1, 2012.

The remainder of this letter provides further details of: 1) the evaluations performed to identify potential off-airport treatment building locations; and, 2) the evaluations of on-airport locations and additional requirements associated with the construction of the IRA treatment building on MAA property.

LMC has evaluated several potential off-airport locations for the treatment building. These included locations that would require acquisition of land outside of MSA, as well as locations at our Middle River Complex (MRC). However, all of the off-airport locations carry significant limitations and drawbacks, and LMC believes that on-airport locations in the vicinity of the DRA offer the best combination of constructability, ease of maintenance, and achievable schedule to expedite construction of the DRA IRA and prevent the discharge of VOCs to FMC.

Background

The DRA at MSA is the location of a 22-acre landfill associated with former industrial operations. The land is currently owned by MAA, and a portion is leased from the MAA by the United States Federal Government (through the National Guard Bureau) for use by the Maryland Air National Guard (MDANG).

Groundwater in the DRA is impacted by volatile organic compounds (VOCs), including trichloroethene (TCE) and associated breakdown products, 1,4-dioxane, and heavy metals. The plume is currently migrating towards FMC, a tidal estuary of Chesapeake Bay. It is our understanding that the Maryland Department of the Environment (MDE) will publish a swimming advisory on their website for a portion of FMC adjacent to the DRA shoreline due to detected concentrations of vinyl chloride in surface water. Signs warning of the advisory are expected to be installed along the shoreline sometime this spring.

The Dump Road IRA will consist of a groundwater extraction and treatment system. A line of 16 extraction wells will be installed between the landfill area and Frog Mortar Creek on the east side of the DRA, as shown on **Figure 1**. The land is wooded, and includes ponds and wetlands within the Chesapeake Bay Critical Area. The current 30% design of the IRA assumes the off airport construction of a treatment building to house the process components of the treatment system. The design calls for an engineered steel building with approximately 14,400 square feet of floor space (80 feet wide by 180 feet long), with a roof peak 26 feet above the floor slab.

*Due to its size, Figure 1 appears on the next page
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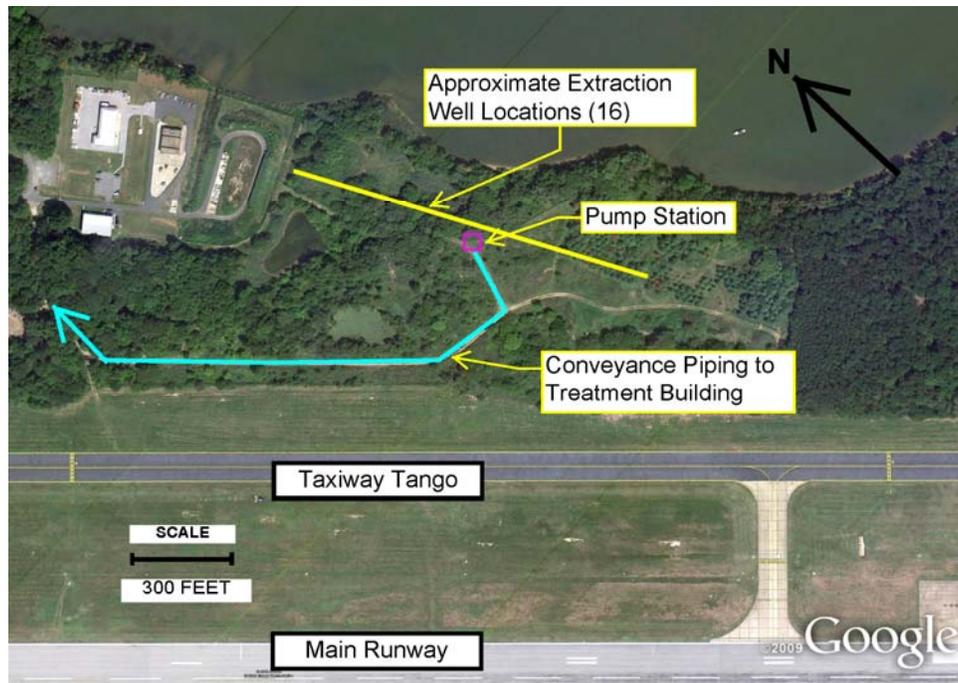


FIGURE 1 - CURRENT 30% DESIGN PUMP STATION AND PIPING LAYOUT (TREATMENT BUILDING AT AN OFF-AIRPORT LOCATION)

Should the location of the treatment building be some distance from the extraction wells, it will require the construction of a pump station within the DRA (a structure approximately 25 feet square and 15 feet tall) where extracted groundwater from the wells would be pumped for collection. The consolidated flow would then be pumped to the remote treatment building. The treatment steps in the current design include metals removal, air stripping to remove VOCs, activated carbon for the offgas treatment, a chemical oxidation system for destruction of 1,4-dioxane, and ion exchange for final metals treatment prior to a surface water discharge. Discharge to a publicly owned treatment works (POTW) via sanitary sewer has been discouraged by Baltimore County, and LMC understands that a permit for a POTW discharge would only be granted as a last resort.

Operating staff will require daily access to the treatment building. Regular deliveries of treatment-related chemicals and daily maintenance will also be required at the treatment building, as well as occasional access to replace vapor- and liquid-phase activated carbon and removal of accumulated solids generated by the metals-removal step.

The DRA groundwater has elevated concentrations of iron and manganese which will likely lead to significant solids buildup in the raw water piping, requiring frequent maintenance to keep the lines clear. Cleaning could include “pigging,” chemical flushes, water jetting, or a combination of techniques. Numerous closely-spaced manhole structures are planned along the entire length of the conveyance piping route between the pump station and the treatment building to provide access for manual cleaning.

Ideally, the treatment building should be located as near as possible to the DRA in order to mitigate the risks and maintenance challenges associated with pumping impacted groundwater long distances.

Off airport Alternatives

LMC has evaluated several potential off-airport locations for the treatment building. These included locations that would require acquisition of nearby land outside of MSA, as well as locations at our Middle River Complex (MRC).

LMC performed a local real estate market survey to identify potential off-airport properties that could be acquired for construction of the treatment building. The nearest potentially-suitable private property for locating the treatment plant is located approximately 4,000 feet to the north on Lynbrook Road, while the nearest potentially-suitable parcel that is for sale is over a mile away on Eastern Boulevard. The nearest available parcel at MRC is almost two miles (by pipeline) from the DRA.

The real estate market survey focused on three nearby parcels that were under consideration for acquisition. A local real estate broker was commissioned to approach the property owners to evaluate their interest in selling their property. One property owner refused to meet with the broker; the second property was less desirable because it was leased by multiple tenants, and was likely too small to efficiently fit the treatment building footprint; and the third parcel, located on Lynbrook Road, was part of a larger occupied parcel and the owner was unwilling to sell or subdivide the parcel.

An evaluation of the technical and engineering pros and cons of the various off airport locations was also performed, including the potential parcel on Lynbrook Road and locations at MRC. Piping distances between the pump station in the DRA and the various treatment building locations ranged between 4,000 ft and 11,000 ft. The evaluation of the off-airport alternatives considered piping installation in open trenches between the treatment building and the pump station, as well as an alternative that utilized directional drilling from MRC, under the airport facilities, and ending in the DRA. All the off-airport locations had significant drawbacks, including:

- Long piping runs conveying contaminated groundwater through the entire National Guard Bureau Federal leasehold and along public roads (Lynbrook Road or Eastern Boulevard), or just inside the Martin State Airport northern fence line parallel to Eastern Boulevard in order to reach properties at MRC. These lines will likely require frequent access for cleaning, and long piping distances increase the potential for leaks or damage, with associated potential off airport releases of contaminated water;
- Locations closest to the DRA are at least 4,000 feet away (on Lynbrook Road) and require acquisition of land that is currently not for sale;
- Maintenance situations could entail three teams operating simultaneously in widely spaced locations (inside the treatment building, along the conveyance piping route, and at the extraction wells/pump station), resulting in a large number of maintenance personnel accessing various areas of MAA and MDANG facilities;
- Significant length of return piping for treated water discharge to Frog Mortar Creek outside of the Federal leasehold; and
- Costs over the life of the treatment system will likely increase with distance due to increased construction and long-term maintenance costs.

However, all of the off-airport locations carry significant limitations and drawbacks, and LMC believes that on-airport locations in the vicinity of the DRA offer the best combination of constructability, ease of maintenance, and achievable schedule to expedite construction of the DRA IRA and prevent the groundwater discharge of VOCs to FMC.

Proposed On airport Alternatives

In consideration of the difficulties associated with locating the treatment building on a parcel off airport property, three on-airport treatment building alternatives have been evaluated.

Potential on airport locations for the treatment building are shown on **Figure 2**. They include:

- Alternative 1: MAA-owned parcel near the DRA on the National Guard Bureau leasehold;
- Alternative 2: MAA-owned land in the DRA adjacent to the planned IRA extraction wells; and
- Alternative 3: MAA-owned land in the DRA, but south of the landfill footprint.

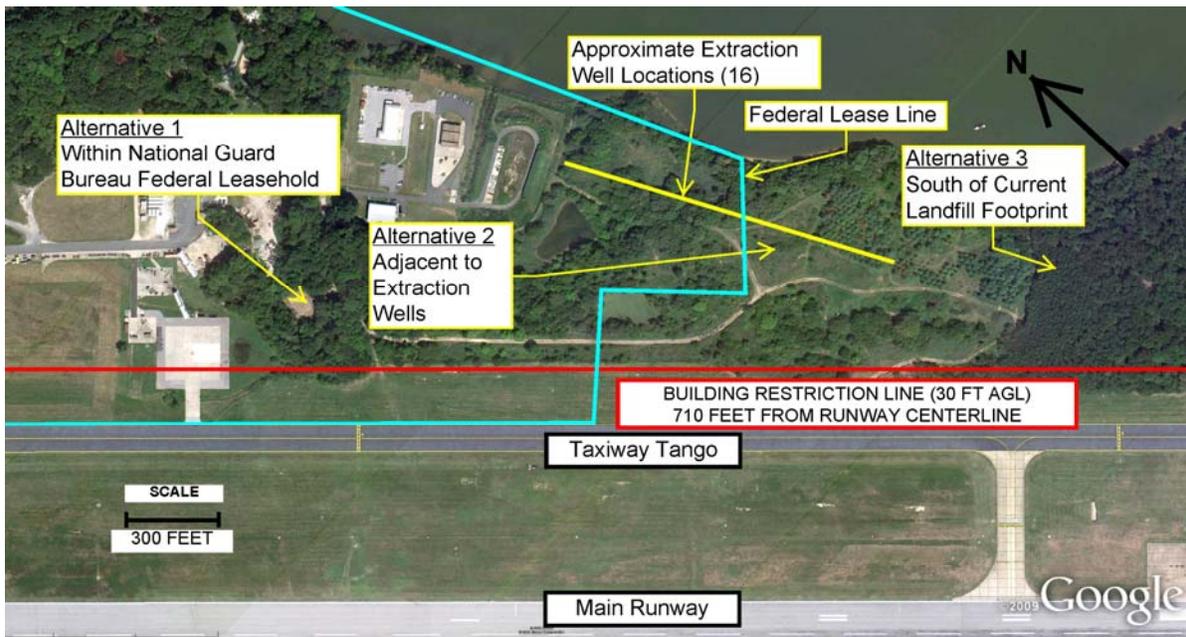


FIGURE 2 - PROPOSED ON-AIRPORT TREATMENT BUILDING LOCATIONS

LMC understands that there are challenges common to all three on-airport locations, including:

- All locations likely require modification to the Airport Layout Plan (ALP), and the need to obtain FAA approval;
- Daily access for maintenance staff and periodic deliveries through the MDANG security portal will be necessary;
- Utilities such as potable water, sanitary sewer, power, and natural gas will need to be conveyed long distances from off the airport property, or access to MDANG utilities will need to be negotiated;
- Due to the proximity of the airport runway and Taxiway Tango, airport safety concerns need to be mitigated both during construction and for the permanent siting of the structure; and
- All three sites are located within the Chesapeake Bay Critical Area, and require significant clearing, grading, and addition of impervious surface. These impacts will likely require mitigation at an off-airport location.

Conversely, all three sites also offer definite advantages when compared to any off-airport location:

- Short piping runs from the extraction wells to the treatment building, easing maintenance and reducing the potential for leaks or damage;
- The sites are in a remote area with no nearby residences and a strong security presence;
- Frog Mortar Creek is very close by for surface water discharge of treated water;
- All system components would be located on state-owned land, likely streamlining the permitting process because the State of Maryland would have sole jurisdiction; and,
- All maintenance tasks would be confined to a relatively small area of the site, streamlining staffing and oversight tasks.

Additional advantages and disadvantages unique to each location are discussed below.

Alternative 1

Alternative 1 would place the treatment building close to the DRA, in the southern portion of the National Guard Bureau Federal leasehold (Figure 2). Groundwater pumped from the extraction wells would be consolidated in a pump station, and from there pumped to the treatment building location.

Beyond the advantages common to the three on airport alternatives, Alternative 1 has an additional benefit:

- No waste is believed to be buried at Alternative 1 location, simplifying the process of designing and constructing the treatment building at this location (compared to Alternative 2).

Disadvantages of this alternative include:

- The proposed treatment plant location within the National Guard Bureau Federal leasehold would require modifying a Federal lease between the United States Government and MAA. It is unknown how readily such a modification could be accomplished, if at all; and
- The treatment plant would occupy an area within the MDANG footprint; the area would be unavailable to MDANG for any other use.

Alternative 2

Alternative 2 would place the treatment building in the DRA within the landfill footprint, immediately adjacent to the row of extraction wells that will be installed to intercept the groundwater plume (Figure 2). The extraction wells would pump groundwater directly to the treatment building; no pump station would be required.

Specific advantages of this alternative include:

- Very short piping runs from the extraction wells to the treatment building, easing maintenance and reducing the potential for leaks or damage;
- The pump station can be eliminated;

- This location will likely require the removal of fewer trees than Alternatives 1 and 3, and therefore will likely be favored by the stakeholders over Alternatives 1 and 3; and,
- This location offers a direct discharge of treated water to FMC, and will be accomplished outside of the Federal leasehold.

However, this location has a significant disadvantage when compared to Alternatives 1 or 3:

- The treatment building would be located within an area with significant quantities of buried waste, as well as impacted groundwater. Special foundation design may be required, a vapor barrier will be necessary beneath the building, and some consideration will need to be placed on either removing the waste material prior to construction, consolidating it and capping it in place, or some combination.

Alternative 3

Alternative 3 would place the treatment building in the DRA south of the landfill footprint, at a location beyond the limits of landfilled waste (Figure 2). In many ways this alternative is similar to Alternative 1. The pump station would be required, and the distance from the pump station to the treatment building is approximately the same for each alternative.

Advantages and disadvantages of Alternative 3 are similar to Alternative 1, with the exception of the need to modify a Federal lease between the United States Government and MAA, since Alternative 3 is not within the National Guard Bureau Federal leasehold.

The advantages include:

- Constructing beyond the limits of waste simplifies the process of designing the treatment building at this location (compared to Alternative 2); and
- This location offers a direct discharge to FMC, accomplished outside of the Federal leasehold.

The primary disadvantage of this location is related to environmental concerns:

- The site is located within the Chesapeake Bay Critical Area, and requires more clearing, grading, and tree removal than Alternatives 1 and 2. Nearby wetlands may also complicate permitting requirements.

Summary

As demonstrated above, LMC has carefully evaluated potential off-airport locations for constructing the IRA treatment building, but the drawbacks of constructing off-airport are significant, and may also delay implementation of the IRA and our ability to prevent migration of VOCs into Frog Mortar Creek in a timely manner.

Based on our review of the on airport options, Alternative 2 adjacent to the extraction wells and off the Federal leasehold has clear advantages over Alternatives 1 and 3, and we believe any disadvantages can be managed. Given these considerations, LMC is requesting MAA approval to locate the treatment building adjacent to the extraction wells. A possible building layout is shown below on Figure 3:

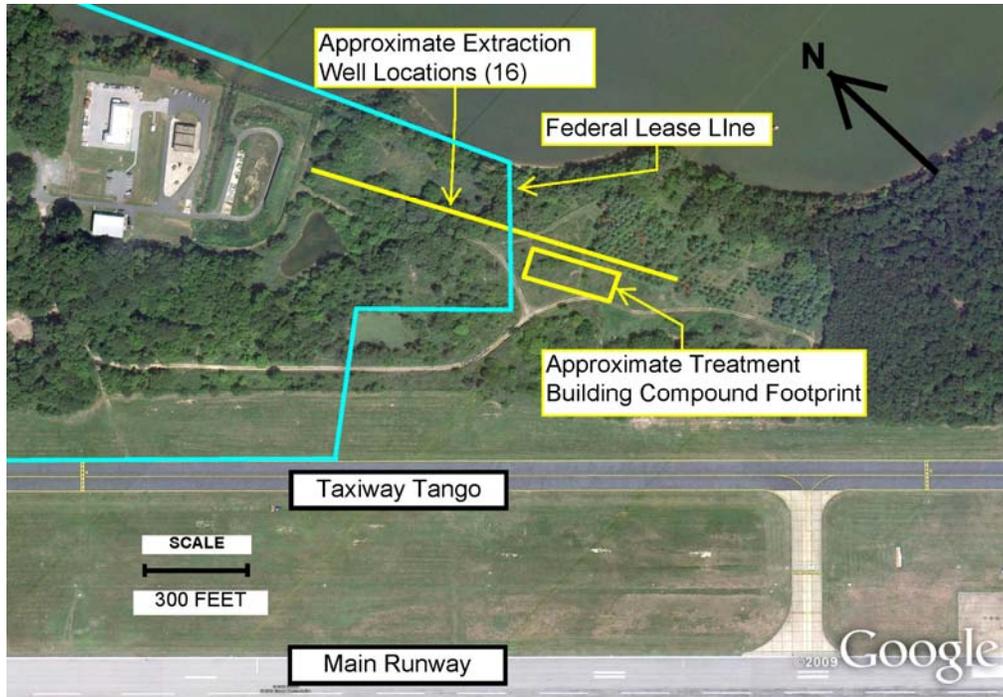


FIGURE 3 - PROPOSED ON-AIRPORT LOCATION FOR TREATMENT BUILDING

LMC is committed to working with MAA to expedite the approval of Alternative 2 as a location for the treatment building, including supporting any permitting requirements and incorporating any design changes necessary to meet the requirements of the FAA, MAA, MDANG, and MDE.

LMC also recognizes that there will be numerous permitting, design, and construction elements that will require coordination and cooperation in order to receive the necessary approvals and complete construction in a timely manner. These include:

- **Building design elements.** Currently the IRA design calls for an engineered steel building, approximately 80 feet wide, 180 feet long, and 26 feet tall at the roof peak above the floor slab. The building would rest on a footprint approximately 120 feet wide and 280 feet long (approximately 34,000 square feet) in order to provide the necessary space for parking, deliveries, and maintenance.
- **Cleared area/tree removal.** In addition to the 34,000 square feet of site impact represented by the building footprint, an additional 90,000 square feet of clearing and road improvements are expected to provide access to the treatment building from the end of the paved portion of Lynbrook Road, as well as permanent access paths to each of 16 extraction wells.
- **Wildlife impacts.** LMC recognizes that there may be limitations to on airport construction from the possible presence of the least tern, as well as nesting bald eagles on the MDANG parcel. We believe that we can construct the treatment building on airport without impacts to these species.
- **Utilities.** The treatment building will require potable water, sanitary sewer, electric power (480-volt, 3-phase, 700-amp service), and natural gas. These could be obtained from MDANG if they have sufficient capacity and approvals can be obtained, or new service lines could be brought on-airport from Eastern Boulevard.

- **Easements.** In addition to easements associated with the buried utilities noted above (water, sewer, power, natural gas), 9 of the planned 16 extraction wells will need to be installed on the Federal leasehold in order to provide capture of the contaminated groundwater plume. Regular access will be required to maintain and clean the wells. In addition, piping and electrical lines will be buried between the extraction wells and the treatment building. The piping will likely require regular access for cleaning.
- **Air emissions.** The current treatment system design includes an air stripper to remove VOCs from groundwater. Although the air stream would be treated to remove VOCs prior to discharge, any residual, post-treatment air discharge emissions may be considered an air emission source for the airport.

LMC is ready to discuss our plans further with MAA once you and your staff have had an opportunity to review this request. LMC stands ready to support efforts associated with obtaining Federal Aviation Administration approval, permitting requirements, and addressing other aspects that may impact Martin State Airport and the Maryland Air National Guard. Please do not hesitate to contact me at 240-460-7508 or tom.d.blackman@lmco.com if you have any questions.

Sincerely,



Thomas D. Blackman
Project Lead, Environmental Remediation

Attachment: **Proposed Plan**, Interim Remedial Action, Groundwater Operable Unit at the Dump Road Area Site (MD-304) at Martin State Airport, Middle River, Maryland

cc: via email with attachment

Christine Kline, Lockheed Martin
Norm Varney, Lockheed Martin
Dale Truskett, Lockheed Martin
Arthur O'Connell, MDE
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Mark F. Williams, Manager, Division of Environmental Compliance
175th MANG Commander, care of Walt L. Moddison, Major, USAF