



October 30, 2017

Wayland Recreation Commission
41 Cochituate Road
Wayland, MA 01778

**Re: Athletic Field at Oxbow Meadows
Licensed Site Professional Peer Review
Wayland, Massachusetts**

Dear Wayland Recreation Commission:

Tetra Tech reviewed a letter from Schofield Law Group LLC including an appended opinion letter that was prepared by Underground Energy LLC regarding potential residual contamination at the former Nike missile site at 133 Oxbow Road in Wayland, Massachusetts (the Site). In consideration of the assertions and recommendations contained within this letter, Tetra Tech reviewed applicable and available documents to research the described issues and develop an opinion relative to the planned development of a portion of the Site into a recreational field. Our understanding of the conditions at the Site and our recommendations are presented below.

Historical Background

As documented in the opinion letter and other source documents, the 13.65-acre Site operated as a Nike missile site from 1955 through 1964 by the United States Army and then from 1964 until 1974 by the Army National Guard. During the time that the Site was operated as a missile site, surface to air missiles were stored in bunkers that were located in the area of the proposed recreation field. The National Guard reportedly used the facility as a storage facility from 1974 through 1997.

Environmental assessment and remediation activities were performed by the Army National Guard at the Site in the mid-1990s to address petroleum aromatic hydrocarbon (PAH) compounds in surficial soils in accordance with the Massachusetts Contingency Plan (MCP) under the Massachusetts Department of Environmental Protection (MassDEP). Remediation was completed in accordance with the MCP.

A pre-acquisition environmental assessment including the collection, sampling and analysis of soil and groundwater samples for analysis of potential contaminants of concern was performed by Bois Consulting Company, Inc. in the mid-2000s on behalf of the Town of Wayland. Hazardous building materials inspections were also performed to evaluate potential contaminant sources that would need to be mitigated prior to demolition. Prior to the Town of Wayland acquisition in 2009, the former missile bunkers and other Site structures were demolished/decommissioned. Pre-demolition inspection within the bunkers identified hydraulic equipment that was used to raise the missiles from the bunkers; however, no fire extinguishing/suppression systems were noted in the bunkers or support structures.

As part of MassDEP-approved decommissioning efforts of the former missile bunkers in 2009, hydraulic equipment was removed; the concrete roof and upper portions of the concrete bunker walls were demolished; the concrete bottoms of the bunkers were penetrated; and soil was imported to fill and cover the former bunker areas. Since that time, the Site use has been for passive recreation including walking trails; however, approximately 3 acres on the southeasterly portion of the Site were developed with 16 residential units. A portion of the passive recreation parcel of the Site is to be converted to a grass recreation field.

Opinion Letter Summary

A letter dated September 27, 2017 from Schofield Law Group LLC to the Town of Wayland Zoning Board of Appeals included an appended opinion letter that was prepared by Underground Energy LLC dated September 26, 2017 regarding the possible presence of perfluorinated compounds (PFCs) including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) at the Site.

As presented in the opinion letter, PFCs use included firefighting foams for flammable liquids, and it is suspected that firefighting foam may have been stored and used at the Site, although it was acknowledged that “there is no documentation of PFC use at the former Nike Missile site”. The opinion letter also briefly discusses the possible presence of other “emerging contaminants” at the Site; however, the suspected presence of these emerging contaminants is not substantiated in the letter. Recommendations within the opinion letter include a sampling program prior to redevelopment or earthwork as follows:

- An assessment of the location and condition of any wells at the Site and in the area; and,
- Sampling and analysis of groundwater from all on-Site monitoring wells and any nearby municipal wells for analysis of all promulgated drinking water constituents and emerging contaminants including PFCs, hexavalent chromium, nitrosamines, perchlorates, and 1,4-dioxane.

PFCs/PFAS Overview

PFCs, or more accurately per- and polyfluoroalkyl substances (PFAS), were developed in the 1940s and used for decades to make products that resist heat, oils, grease, stains and water. PFAS are considered an “emerging contaminant” whose presence in the environment (predominantly groundwater) has only recently been considered by state and federal regulators; however, regulatory standards are being developed by some regulatory agencies (although not yet by MassDEP). The most common route of exposure to humans is ingestion (i.e. consumption of contaminated water or food), and high risk exposures can result in adverse health effects.

Tetra Tech Opinion

It is our opinion that the pre-acquisition and decommissioning activities that were performed at the Site in the mid to late 2000s were of the appropriate nature and scope to adequately assess suspected contaminants of concern at that time and appropriately decommission the former structures. However, further investigation of other contaminants that may have not been previously evaluated (including emerging contaminants such as PFAS) may be warranted if a suspected source exists, and the presence of this contaminant may present an exposure that presents excessive risk. Further, any project that could potentially exacerbate or mitigate future remediation of identified or suspected contaminants should also be reviewed.

We agree that a review of PFAS use and storage at the Site is warranted based on the information contained within the opinion letter and the developing regulatory framework regarding PFAS. As such, Tetra Tech reviewed the assertions presented in the opinion letter relative to possible sources of PFAS, potential exposures to PFAS, and the potential impact of the planned recreational field. Following is a summary of our review:

- PFAS Sources: Based on our review of available records, the likelihood of a significant source of PFCs/PFAS at this Site is low. This opinion is based on the lack of documentation suggesting that PFAS firefighting foams ever existed at the Site including no observed firefighting infrastructure within the bunkers or surrounding area. Further, the Maryland Department of the Environment commissioned a study entitled Emerging Contaminants at Nike Sites Initiative (ECI). The ECI’s objectives included identifying Nikes Sites in Maryland where PFCs/PFAS may have been used and assessing the potential impact of PFC/PFAS, specifically aqueous film forming foam (AFFF) that may have been used for fire suppression. In summary, “According to available information, perfluorinated compounds such as PFOS and PFOA were not used in AFFF by the military until approximately 1965. By this time, liquid fuels used in Ajax and Atlas missiles were being phased out and replaced with solid fuel-propelled missiles. This timeline corroborates the ACE’s (Army Corp of Engineer’s) conclusion that the use of AFFF containing PFOS or PFOA on Nike bases is unlikely.” The ECI study dated May 2017 is appended to this letter.
- Exposure – Site Soils: PFAS do not effectively sorb to soils. Decades of rainwater since PFAS would have theoretically been released would have substantially flushed PFAS through the soils and into groundwater which is located over 45 feet below ground surface. Further, due to the documented importation of soil in the area of the former bunkers (reportedly several feet), the theoretical presence of any residual PFAS in soils would be beneath imported soils in the area of the former missile bunkers. Development of the recreation field is predominantly a surficial grading process with little to no excavation of subsurface soils. Further, it is believed that the surface of the field will be comprised

of imported topsoil to support the vegetated cover. Therefore, exposure of PFAS in Site soils resulting from a theoretical historic release, if present, is not a likely concern in the area of the proposed recreation field.

- Exposure – Drinking Water: The nearest municipal drinking water wells are over 2,000 feet away from the Site. Based on the attached MassGIS Phase I Site Assessment map dated October 25, 2017, the Site is NOT located within the Zone II (contribution area) of any public water supply wells, which is contrary to statements within the Underground Energy LLC opinion letter. Also, according to Town of Wayland and Town of Lincoln Health Department and Board of Health records, there are two (2) private drinking water wells and six (6) private irrigation wells located within one-half mile of the Site. The drinking water wells are located at #1 Weir Meadow Path in Wayland (approximately one-half mile south-southwest of the Site) and #82 Birchwood Lane in Lincoln (approximately 1,500 feet north-northwest of the Site).

It is possible that the detection of PFAS in area drinking water wells could warrant further investigation of all potential sources of PFAS in the area; however, if the Site was considered a potential source, the presence of the recreation field at the Site would not preclude such an investigation. Lastly, Tetra Tech attempted to locate the previously-installed groundwater monitoring wells that were installed at the Site in 2004; however, the monitoring wells are believed to have been destroyed or decommissioned. Assessment for specific compounds of interest is typically driven by evidence of the use or storage of such compounds. Given the lack of evidence that past operations on the Site could have served as a source for the compounds in question, replacement of these monitoring wells is not believed to be warranted at this time.

- Potential Project Impacts: The development of a portion of the Site into a recreation field should be considered generally independent of any potential future investigation into residual environmental contamination at the Site. Site access in the area of the proposed recreation field for future investigation and remediation activities would not be substantially impacted by the presence of a grass field. Should additional investigation be warranted at some point in the future based on new information or changes in regulatory framework, the presence of an athletic field should not hinder such an investigation. Therefore, at this time, it is our opinion that the professional standard of care does not support further environmental investigation activities at the Site.

Summary

Based on available information about the Site, there is currently no suspected source of contaminants (including PFCs/PFAS and other emerging contaminants) that warrant further investigation activities prior to development of the recreational field at the Site. Although investigative tasks are typically driven by site history and potential for release of oil or hazardous materials (OHM), one may always *choose* to add more conservative elements to an investigation out of an abundance of caution. However, given the record and the history of the site, including past investigations, we do not believe that replacing the former monitoring wells at this time in order to collect soil and/or groundwater samples for laboratory analysis targeting emerging contaminants is supported. If new future information suggesting such an investigation is warranted, such as detection of contaminants at neighboring wellheads where hydraulic connection to the Site is demonstrated or strongly inferred, such an investigation can be carried out at that time without significant hindrance from use as an athletic field.

If you have any questions or comments, please feel free to contact us at (508) 786-2200.

Very truly yours,

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Director or Remediation, Assessment and Compliance

Michael E. Billa, P.G., P.E., L.S.P.
Vice President

Attachments: MD Emerging Contaminants at Nike Sites Initiative, Maryland Department of the Environment, May 2017
MassDEP Phase 1 Site Assessment Map, 133 Oxbow Road, Wayland

