



QUASSAICK CREEK WATERSHED ALLIANCE



July 21, 2020

Nicole Wireman, REM
Restoration Program Manager NGB/A4VR
National Guard Bureau
3501 Fetchet Avenue
Joint Base Andrews, MD 20762-5157

Re: Comments on Draft Final Expanded Site Inspection Report at Stewart Air National Guard Base

Dear Ms. Wireman:

We respectfully submit these comments on the Draft Final Expanded Site Inspection Report for Per- and Polyfluoroalkyl Substances for the 105th Airlift Wing, New York Air National Guard, Stewart Air National Guard Base located in Newburgh, New York (“Draft Expanded SI Report” or the “Report”).

As detailed below, we have identified several aspects of the Draft Expanded SI Report that warrant further consideration as the Air National Guard (“ANG”) evaluates the data and progresses to the next phase of the remediation process, the Remedial Investigation. The conclusions drawn from the data presented in Draft Expanded SI Report will inform the ANG’s proposed plan to finally address PFAS pollution at Stewart Air National Guard Base (“SANGB or the “Base”) resulting in off-base contamination of several public and private drinking water supplies and fish. Getting this right is a paramount public health issue for our community.

More than four years after PFAS were first detected in public drinking water supplies, the ANG’s historic use of these chemicals continues to put the health of those exposed at risk. It also imposes serious costs to New York State, which has funded the provision of water from an alternate source and/or filtration of water sources, and risk of future costs to communities already burdened with high utility rates. Meanwhile, PFAS-contaminated water continues to flow from SANGB into local waterways and groundwater, threatening several public and private drinking water supplies in the vicinity of the base. Ensuring that the ANG proceeds expeditiously towards a comprehensive cleanup - one that will fully decontaminate the legacy sources of PFAS contamination present at SANGB - is a necessary step to safeguard the long-term health of our community.

The use of PFAS-containing chemicals for training, storage and use in firefighting at SANGB has left the Base polluted with these chemicals. In some areas of the Base, PFAS has been measured at levels several orders of magnitude above those deemed safe by public health agencies. Given the well-documented adverse health effects associated with exposure to PFAS, and the fact that these chemicals resist breaking down in the environment, our primary goal is to work with the ANG to stop the flow of PFAS from the Base. We know migration off-base can occur through groundwater and surface water flow. PFAS has been detected in private and municipal wells in the Town of New Windsor and the Town of Newburgh - in addition to the well-documented contamination of Washington Lake, which had served as the primary drinking water reservoir for the City of Newburgh for decades. Understanding these pathways for how PFAS contamination spreads is a critical step to any future cleanup at the Base, and to ultimately resolving the drinking water contamination crisis. It is also important to recognize that Base pollution has contaminated fish in several local waterways, putting at risk the health of those who rely on subsistence fishing, recreational anglers, and wildlife.

Our comments are designed to assist the ANG in fulfilling its promises to the community. Due to the extremely short comment period, we offer these comments provisionally. What follows is a summary of our comments and should not be considered complete or exhaustive. These comments represent the views of our organizations, but not of the Restoration Advisory Committee (“RAC”). Further review and comments by the RAC may be required, particularly to ensure the scope of the subsequent Remedial Investigation is sufficient to define the extent of PFAS pollution and to address all off-base impacts.

I. The ANG’s Practices to Date Fail to Ensure Meaningful Community Input

As a preliminary matter, we want to first express our concern regarding the ANG’s process for soliciting community input to inform remedial activities underway at SANGB. RAC organizational members only received a copy of the Draft Expanded SI Report on July 8th - five calendar days before the comment deadline - leaving us only two full business days to read the 500+ page document, digest the data and findings, formulate a response, and draft these comments. Moreover, we obtained a copy of the Draft Expanded SI Report not from ANG, but rather from the New York State Department of Environmental Conservation (“DEC”).

The ANG attempted to share a copy of the Draft Expanded SI Report on June 13th, but only sent an email to two members of RAC, one of which is the community co-chair. Though the email was quickly forwarded to the whole RAC, the RAC members then faced numerous issues accessing the document using the link provided, and confusion about the ANG’s stated intention to restrict the sharing of the document. It is incumbent on the ANG to share documents for comment directly with all RAC members and ensure the document is actually accessible for meaningful input. Even counting the ANG’s first attempt at sharing the document, the RAC members were only provided a month to comment on this highly technical document. Not only was no technical support provided by the ANG, but the ANG raised additional barriers to access technical expertise from both the RAC organizational members and outside technical consultants.

Naturally, this truncated review period inhibits our ability to meaningfully contribute to ANG’s efforts to address PFAS contamination in our community. It also runs counter to public statements made by the

Department of Defense (“DOD”) regarding its engagement with communities. In a 2019 report to Congress, DOD stated that “the Department will work in collaboration with regulatory agencies and communities, and will continue to facilitate open and transparent information sharing” as it moves through the cleanup process.¹

The ANG failed to meet that standard here. As members of the community that will have to live with the effects of PFAS exposure and the consequences of remediation decisions, it is imperative that our perspective be factored into the cleanup at SANGB.

Going forward, we ask that the full RAC be afforded sufficient time to review any important materials that result from remedial activities at SANGB, and that their sharing of technical documents be explicitly unrestricted, so they can take advantage of any and all assistance available. The need for technical expertise in reviewing a document such as this is also further evidence of the RAC’s need for funding to cover the costs of independent third-party experts. More broadly, we ask that ANG abide by the public participation standards applicable to New York State public bodies under the Open Meetings Law.

II. The Scope of the Investigation Must Ensure that PFAS Exposures Will Not Threaten Human or Ecological Health

A. The ANG Must Use Health-Protective Screening Levels to Assess PFAS Contamination

Simply stated, the screening levels (“SLs”) used in the Draft Expanded SI Report are outdated and inadequate to protect public health. For PFOA and PFOS, the SLs proposed by ANG are 40 ppt in water and 0.13 mg/kg in soil; for PFBS, the SLs are 40,000 ppt in water and 130 mg/kg in soil.² These SLs are crucial as the results of samples compared to these levels will underpin decision-making with respect to the remediation at SANGB going forward. Per the Draft Expanded SI Report, “[a] release is considered to be confirmed” only if the measured PFAS concentrations exceed the SLs.³ ANG intends to use these SLs “for decisions on all [potential release locations] in the future.”⁴

The SLs that ANG proposes to guide remediation at SANGB will not safeguard drinking water supplies from the adverse health consequences attributable to ANG activities. For some PFAS, adverse health effects can be expected at levels as low as 1 ppt in water.⁵ Neighboring states have adopted binding drinking water regulations far more stringent than the SLs proposed here. Moreover, in just days New York State is expected to promulgate the most stringent drinking water regulations for PFOA and PFOS at levels four times more protective than the ANG’s SLs. These Maximum Contaminant Levels

¹ U.S. Dep’t of Defense, Drinking Water Contamination Report to Congress (July 2019), <https://denix.osd.mil/derp/featured-content/reports/dod-drinking-water-contamination-report-to-congress/>.

² Draft Expanded SI Report at ES-2.

³ Draft Expanded SI Report at ES-2.

⁴ Draft Expanded SI Report at 5-1.

⁵ See New Jersey Drinking Water Quality Institute, Maximum Contaminant Level Recommendation for Perfluorooctanoic Acid in Drinking Water: Basis and Background at 3 (Mar. 2017), <https://www.nj.gov/dep/watersupply/pdf/pfoa-recommend.pdf>; Alissa Cordne et al., *Guideline Levels for PFOA and PFOS in Drinking Water: the Role of Scientific Uncertainty, Risk Assessment Decisions, and Social Factors*, 29 J. Exposure Sci. & Env’tl. Epidemiology 157, 163 (2019), <https://www.nature.com/articles/s41370-018-0099-9>.

(“MCLs”) will be translated into enforceable Water Quality Standards that determine remediation goals. ANG must use the proposed MCLs as guidance for setting SLs, otherwise the entire analysis to date will be rendered useless once the MCLs are promulgated.

ANG’s SLs are also out of sync with the latest science from the federal government. The Agency for Toxic Substances and Disease Registry (“ATSDR”) develops what are called minimum risk levels (“MRLs”) based on health and toxicological data pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”). As ATSDR states, these minimum risk levels are intended to be used as “screening levels” that should be used to “identify environmental exposures that might harm people’s health.”⁶ ATSDR’s MRLs, when converted to drinking water concentrations for PFOA and PFOS, are far lower than the levels selected to inform remedial activities at SANGB.⁷ A pending update to those MRLs demonstrate that levels even lower than proposed by New York State are needed to limit public health risks from environmental exposures.⁸

There is no science-based reason for ANG to continue to rely on SLs based on outdated Health Advisory Levels issued by the U.S. Environmental Protection Agency (“EPA”).

The impact of the lax SLs used by ANG to interpret the PFAS sampling data presented in the Draft Expanded SI Report, is to underplay risks to the people exposed to polluted drinking water and limit proposed next steps in the remediation process. For example, the Draft Expanded SI Report presents data for seven surface water samples taken from Patton Brook and a wetland near the former base landfill. The Draft Expanded SI Report notes that only one sample exceeded the outdated 40 ppt SL for PFOA and PFOS, and concludes that “this pathway would not have represented a significant source to Lake Washington.”⁹ However, all samples exceed health-protective levels based on New York State’s proposed MCL and ATSDR’s draft MRLs and should be subject to further investigation and addressed in any remediation. This is only one example of how the SLs used in Draft Expanded SI Report fail to protect the community around SANGB.

We therefore concur with DEC and the City of Newburgh, who have advised ANG on numerous occasions as to the insufficiency of SLs used to evaluate contamination at SANGB. To the extent that the ANG seeks stakeholder support of its remediation activities, we insist that no conclusions be drawn or recommendations be made based on the proposed SLs, which are not in line with impending New York State regulations and the latest science.

⁶ ATSDR, ATSDR’s Minimum Risk Levels (MRLs) and Environmental Media Evaluation Guides (EMEGs) for Perfluoroalkyls (PFAS) at 1 (Nov. 2018), <https://www.atsdr.cdc.gov/pfas/docs/PFAS-MRL-HA-H.pdf>

⁷ *Id.* at 2.

⁸ See ATSDR, Toxicological Profile for Perfluoroalkyls at 15–16 tbl. 1-2 (draft. June 2018), <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>; Ass’n of Safe Drinking Water Admrs., Press Release: ATSDR Releases Draft Toxicological Profile for PFAS (June 21, 2018), <https://www.asdwa.org/2018/06/21/atsdr-releases-draft-toxicological-profile-for-pfas/> (converting to drinking water standards).

⁹ Draft Expanded SI Report at 4-16, 6-16.

B. The ANG Must Screen for All PFAS Possible Using EPA- or DEC-Validated Methods

The screening criteria used at SANGB are also outdated and entirely insufficient with respect to the range of PFAS analyzed in the Draft Expanded SI Report. DEC guidance recommends testing for 21 PFAS and contains detailed laboratory and data quality guidelines to ensure accurate results.¹⁰ Moreover, EPA has developed two analytical methods that can “effectively measure” 29 PFAS.¹¹ Yet the ANG chose a method that can measure 18 PFAS chemicals and limited analysis at SANGB to six out of those 18, providing at best an incomplete picture of the PFAS contamination.

The Expanded SI Report states that the PFAS samples were analyzed using “modified EPA Method 537.” The EPA states, that “EPA is not aware of a standardized description of the modified methods, nor is the Agency aware of studies that have validated the performance of these modified methods across multiple laboratories. Therefore, EPA cannot address the performance of ‘modified methods’ in a general manner.¹² In contrast, EPA states that using “Method 537.1 will ensure that both government and private laboratories can effectively measure 18 PFAS in drinking water, *which is a critical step for estimating exposure and potential health risks to PFAS.*”¹³ The Report only contains results for six PFAS utilizing the unvalidated “modified 537 method” based on their inclusion on the EPA’s third Unregulated Contaminant Monitoring Rule (“UCMR3”).

Limiting testing to only six PFAS is arbitrary and unreasonable. Other Department of Defense sites undergoing investigations in New York State have tested for the 21 PFAS recommended by DEC.¹⁴ And previous surface water sampling undertaken by the City of Newburgh found detectable concentrations of more than 20 PFAS in the vicinity of the Base.¹⁵ As DEC and the City of Newburgh have pointed out, testing for only six PFAS is “insufficient” and “does not provide for a full evaluation of PFAS.”¹⁶ Nor is it likely that testing for additional PFAS will add expense to or delay any sampling efforts. We are missing a critical step to understanding the potential risks posed by the ongoing contamination emanating from SANGB. We must have a more complete understanding of the range of PFAS impacting our community.

Not only is ANG’s failure to account for additional PFAS -unreasonable, its previous response to this concern, stating that testing for additional PFAS is “outside the contracted scope of work,” seems to

¹⁰ See DEC, Guidelines for Sampling and Analysis of PFAS Under NYSDEC’s Part 375 Remedial Programs apps. G–I (Jan. 2020), <https://nysba.org/app/uploads/2020/02/DEC-PFAS-Sampling-and-Analysis-January-2020.pdf>.

¹¹ EPA, *EPA PFAS Drinking Water Laboratory Methods* (last updated Apr. 27, 2020), <https://www.epa.gov/pfas/epa-pfas-drinking-water-laboratory-methods>; see EPA, *EPA Analytical Methods for PFAS in Drinking Water* (Dec. 2019), https://www.epa.gov/sites/production/files/2019-12/documents/table_of_pfas_methods_533_and_537.1.pdf.

¹² EPA, *supra* note 11.

¹³ EPA, *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS): Methods and Guidance for Sampling and Analyzing Water and Other Environmental Media* at 1 (updated Jan. 2020), https://www.epa.gov/sites/production/files/2020-01/documents/pfas_methods-sampling_tech_brief_7jan2020-update.pdf (emphasis added).

¹⁴ See Ltr. from Justin C. Starr, P.G., DEC, to Joday Ann Murata, ANG Readiness Ctr. at 1 (May 21, 2019).

¹⁵ See Memo. from Rick Shoyer & Steve Kirschner, Advanced GeoServices Engineering P.C., to Amy Kendall, Knauf Shaw at tbl. 1 (Apr. 22, 2019).

¹⁶ Starr, *supra* note 14, at 1; Ltr. from Alan J. Knauf, Knauf Shaw LLP, on behalf of City of Newburgh, to Randy Chambers, Nat’l Guard Bureau at 1 (Aug. 10, 2018).

downplay the legitimate health concerns expressed by residents in and near Newburgh. If all 18 PFAS have been measured by Method 537.1, all results must be reported. If all 18 were not measured, future tests must include results for all measurable PFAS, using the latest available EPA validated methods, which at present include EPA Methods 533 and 537.1, which together can measure 29 PFAS, including short-chain PFAS that are of particular concern for the efficacy of treatment technologies in use or being contemplated. EPA Method 533 is specifically designed to test for 25 short-chain PFAS, including 11 that are not detected by Method 537.1.

For all future testing, it is imperative that ANG incorporate all recent advances in PFAS analysis to test for the broadest possible range of PFAS at any given time. This is critical given the changing formulations of PFAS-firefighting foams used and spilled at SANGB over decades, up to and including today, the emerging science about the propensity of PFAS to transform in the environment, and the growing scientific evidence that PFAS should be regulated as a class due to similarities in their extreme persistence and toxicity to multiple bodily systems.¹⁷ A recent study found over 240 distinct PFAS in AFFF and AFFF-contaminated groundwater,¹⁸ underscoring the need for ANG to test samples using Total Oxidizable Precursor Assay or other techniques to quantify as broad a range of PFAS as possible.

The deficiencies laid out above demonstrate that the methodology and design of the investigation to date will fail to identify significant health risks for the community around the SANGB. ANG must ensure that screening levels are health-protective and that all PFAS that can be tested will be tested. Going forward, the ANG needs to periodically assess and update its methodology to ensure it is in line with the latest science.

C. The ANG Must Study All Relevant Human Health and Ecological Receptors and Pathways

As defined in the Draft Expanded SI Report, “a receptor is the entity (organism, population, community, or set of ecological processes) that may be affected by contact with, or exposure to, a contaminant,” and “a ‘pathway’ is the means by which a contaminant migrates through a particular environment to a receptor.”¹⁹ If the remediation is to comprehensively remove threats to public health and the environment, then all receptors and pathways must be defined and addressed. The Preliminary Assessment and Site Investigation, under CERCLA, should include a “comprehensive survey of targets,” defined as “a receptor that is within the target distance limit for a particular pathway. Targets include wells and surface water intakes supplying drinking water, populations, human food chain organisms, sensitive environments, wellhead protection areas, and resources.”²⁰ The Draft Expanded SI Report fails to fulfill this requirement.

¹⁷ Carol F. Kwiatkowski et al., *Scientific Basis for Managing PFAS as a Chemical Class*, *Envtl. Sci. & Tech. Ltrs.*, (pub. June 30, 2020), <https://pubs.acs.org/doi/10.1021/acs.estlett.0c00255>.

¹⁸ Krista A. Barzen-Hanson et al., *Discovery of 40 Classes of Per- and Polyfluoroalkyl Substances in Historical Aqueous Film-Forming Foams (AFFFs) and AFFF-Impacted Groundwater*, 51 *Envtl. Sci. & Tech.* 2047, 2048 (2017).

¹⁹ Draft Expanded SI Report at viii, x.

²⁰ EPA, *Interim Final Guidance for Performing Site Inspections Under CERCLA* at 4, 121 (1992), <https://semspub.epa.gov/work/11/174029.pdf>.

Only a single receptor, Washington Lake, is recognized in the Draft Expanded SI Report. There are at least five other receptors that need to be investigated as part of the Remedial Investigation, to understand and eliminate any pathways from the SANGB to these receptors, including potential groundwater pathways. These receptors include:

- City of Newburgh’s Browns Pond reservoir in the Town of New Windsor, which is contaminated with PFAS,²¹
- Public and private wells in the watershed surrounding Beaverdam Lake, which has confirmed PFAS contamination,²²
- Town of New Windsor’s Kroll well, which is part of its public drinking water and which is contaminated with PFAS,²³
- Town of New Winsor’s Butterhill wells, which are part of its public drinking water system and which are contaminated with PFAS,²⁴
- Private wells in the Town of New Windsor and the Town of Newburgh that are contaminated with PFAS,²⁵ and
- Fish in Recreation Pond, Silver Stream, Washington Lake and Moodna Creek, which are under state catch and release health advisory due to contamination with PFAS.²⁶ Contaminated fish are a concern for both human health exposure and ecological effects.

While not exhaustive, these specific pathways of PFAS contamination should be identified for study as part of the Remedial Investigation:

- Known surface water pathway from SANGB to Recreation Pond, Silver Stream, Washington Lake and Moodna Creek, affecting fish,
- Potential groundwater pathway through fractured bedrock to Browns Pond,
- Potential groundwater pathway through fractured bedrock to Kroll well,
- Known and potential surface and groundwater migration pathways through sand-and-gravel aquifer from Moodna Creek to Butterhill wells,

²¹ New York State Dep’t of Health, *Frequently Asked Questions: Newburgh Area PFOS Contamination* (rev. Feb. 2017), <https://www.health.ny.gov/environmental/investigations/newburgh/faq.htm>.

²² See DEC, Perfluorooctane Sulfonic Acid (PFOS) in Surface Water - Beaverdam Lake Watershed, https://www.dec.ny.gov/docs/remediation_hudson_pdf/newburghpfosfig10.pdf; see also DEC, Investigation Report: Stewart ANG Base and Newburgh Watershed at 4, 8, & tbl. 1 (Aug. 2016) (“DEC 2016 Investigation Report”) (noting SL exceedances at a tributary feeding Beaverdam Lake and noting the possibility that drinking water wells could be impacted by contamination in Beaverdam Lake); Allison Dunne, *NYS Officials Update Beaver Dam Lake Residents on PFOA, PFOS Testing*, WAMC, Feb. 7, 2017, <https://www.wamc.org/post/nys-officials-update-beaver-dam-lake-residents-pfoa-pfos-testing> (noting PFAS detections in private wells).

²³ Ltr from David J. Chiusano, DEC, to George Meyers, Supervisor, Town of New Windsor (May 26, 2020), available at <https://newwindsor-ny.gov/Portals/0/LiveArticles/1270/May%202020%20Kroll.pdf?ver=2020-07-09-154057-807>.

²⁴ Ltr. From David J. Chiusano, DEC to George Meyers, Supervisor, Town of New Windsor (May 13, 2020), <https://newwindsor-ny.gov/Portals/0/LiveArticles/1270/May%202020%20BH.pdf?ver=2020-07-09-154057-290>.

²⁵ New York State Dep’t of Health, *New Windsor Area Private PFOS Results* (updated Sept. 6, 2017), https://www.health.ny.gov/environmental/investigations/newburgh/images/new_windsor_area_private_wells.png.

²⁶ New York State Dep’t of Health, *Hudson Valley Region: Health Advice on Eating Fish You Catch at 15* (undated), <https://www.health.ny.gov/publications/6545.pdf>.

- Known surface water pathway from SANGB to Beaverdam Lake,
- Potential groundwater migration pathways from Beaverdam Lake and its tributaries to public or private wells,²⁷ and,
- Potential groundwater migration pathways from SANGB to private wells in Town of New Windsor and Town of Newburgh.

III. Conclusions about Potential Groundwater Contamination Pathways to Washington Lake and other Receptors are not Supported by Evidence in the Record

A. No Conclusion about Groundwater Migration from SANGB can be Made Without a Thorough Investigation

The Draft Expanded SI Report prematurely concludes that “[a] groundwater PFAS plume does not appear to be migrating to or impacting Lake Washington.”²⁸ Such a conclusion is not supported by evidence in the record. The ANG’s data collected to date is insufficient to rule out the potential for a direct hydrological connection between groundwater from SANGB and Washington Lake. Moreover, PFAS-contaminated groundwater is very clearly impacting the storm drain system, whose discharges ultimately reach Washington Lake from Recreation Pond. Therefore, any conclusions drawn from the data presented in the Draft Expanded SI Report must be revisited or justified in detail.

Contrary to the ANG’s conclusion, there is reason to believe that a groundwater plume could be migrating to Washington Lake. Hydrological evidence suggests that Washington Lake may be partially groundwater-fed. When the then-Village of Newburgh first tapped this water source, in 1853, it was called Little Pond, and had none of the surface water inputs from Silver Stream and Patton Brook that are part of the water system today. The diversions for Silver Stream (1887) and Patton Brook (1892) and a series of work to raise the height of the dam (1853, 1892, 1907, 1912) gave Washington Lake the greater capacity we know today. But groundwater that presumably once bubbled up to fill Little Pond can reasonably be assumed to be contributing to today’s Washington Lake.²⁹

We also know that on-base groundwater at various depths is contaminated with PFAS, and that off-base groundwater has been impacted as well. To the extent that PFAS emanating from SANGB is impacting groundwater in and around the Base, it should be assumed that PFAS is in turn polluting Washington Lake. It is ANG’s burden to explain how the conclusion that PFAS is not impacting Washington Lake is plausible given these hydrological characteristics, which it has not met in the Draft Expanded SI Report. The potential that a groundwater plume is migrating to and continues to pollute Washington Lake is still very much plausible.

²⁷ DEC, in its 2016 Investigation Report, noted that “certain public water supply wells may be in communication with surface waters in Beaverdam Lake” and recommended additional investigation to determine the extent of PFAS contamination. DEC 2016 Investigation Report at 4, 11.

²⁸ Draft Expanded SI Report at ES-3, 7-1.

²⁹ See W.L.F. Warren, *An Abridged History of Newburgh Water Works, from 1852 to March 1, 1901, a Period of 49 Years* (1901).

Moreover, the evidence collected to date by ANG and others clearly shows the existence of a groundwater pathway for PFAS contamination to Recreation Pond and ultimately, Washington Lake. The Draft Expanded SI Report shows that groundwater is a net source of PFOS and PFOA into Recreation Pond, which discharges to Silver Stream and ultimately, Washington Lake. At the same time, an estimated 30 µg/day of PFOA and PFOS seep into groundwater from Recreation Pond. And downgradient from Recreation Pond, monitoring well RPMW-01 shows levels of PFOS almost *fifty times* higher than New York State’s pending drinking water standard. This plainly suggests that PFAS-contaminated groundwater is migrating from Recreation Pond in the direction of Washington Lake. The ANG must collaborate with state and local stakeholders in developing a methodology to fully characterize the nature and extent of PFAS contamination emanating from the Base through groundwater as part of the next phase.

In the meantime, ANG must revise its numerous conclusions downplaying the role of groundwater as a potential conduit for PFAS contamination. It is clear that without more data, no conclusions with respect to the relative magnitude of groundwater contributions from the Base to Washington Lake and other off-base resources can be made.³⁰ The statement that “PFAS were not detected in groundwater at elevated levels across the entire SANGB but isolated to distinct areas”³¹ should also be clarified or contextualized, since Figure 10 shows that almost all of the groundwater wells downgradient from known and suspected PFAS discharges show exceedances of the ANG’s inflated SLs.

There also appear to be several misleading and/or incorrect conclusions related to off-Base groundwater impacts. For example, just before trying to rule out the existence of a groundwater plume impacting Washington Lake, the Draft Expanded SI Report states that “[e]xcept for SL exceedances near Recreation Pond, there were no screening criteria exceedances in off-Base groundwater.”³² In discussing Washington Lake groundwater results, the Draft Expanded SI Report notes “[p]revious groundwater results . . . showed detections of PFOS”, but goes on to state that “[n]o previous groundwater sample results at [Washington Lake] wells exceed the SL.”³³ This is contradicted by the March 2019 Final Site Inspection Report Addendum, which shows significant levels of PFOA and PFOS for nearly all groundwater wells, including one result exceeding the 40 ppt SL for PFOA and PFOS used in the Draft Expanded SI Report, and another result just shy of that level.³⁴ The statement about Washington Lake wells must be deleted, and all conclusions regarding off-Base groundwater impacts must be revised to reflect the uncertainty in the current data.

³⁰ For example, the conclusion that that “[g]roundwater has not been identified as a primary route of transport for PFAS from the Base” is misleading given that a full investigation has not yet taken place and must be removed. Draft Expanded SI Report at 2-4.

³¹ *Id.* at 7-1.

³² *Id.*

³³ *Id.* at 6-17.

³⁴ Monitoring well LWMW-03 (sample ID STWRT-LW-MW03_051718) measured 56.9 ppt of PFOA and PFOS combined on May 17, 2018, a clear exceedance of the ANG’s screening criteria. See N.Y. Air Nat’l Guard, Final Site Inspection Report Addendum at tbl. 3 (Mar. 2019). Monitoring well LWMW-01 (sample ID STWRT-LW-MW01) measured 38.1 ppt of PFOA and PFOS combined on the same date, less than 2 ppt shy of the SL. See *id.*

B. Groundwater from SANGB is Clearly Contributing to PFAS Discharges to Recreation Pond through the Storm Drain System

The extreme PFAS concentrations in dry weather samples indicates that PFAS must be infiltrating the SANGB storm drain system through the groundwater. None of the evidence presented in the Draft Expanded SI Report rules out the possibility that a groundwater plume is impacting Washington Lake through this pathway. The ANG itself acknowledges that “[g]roundwater infiltration through joints and cracks in stormwater pipes results in a consistent dry weather base flow,” and that PFAS are “consistently detected in catch basins during dry weather sampling events” above the SL.³⁵ Several areas at SANGB were found to have “high potential for groundwater infiltration to the storm drain system.”³⁶ Video surveys found “observable groundwater infiltration” through “[c]racks and breaks” from the 17K culvert as well.³⁷ Ten out of 11 dry weather samples along the storm drain exceeded the ANG’s SLs, with exceedances ranging from almost four times to over 100 times the SL for PFOA and PFOS combined.

There has been no attempt to delineate or characterize the groundwater contamination that is impacting the storm drain system. Without this data, DEC’s hypothesis that “the storm sewer system at [SANGB] is intercepting a plume or plumes of groundwater resulting from past releases of [PFAS-containing firefighting foam]” is very much still plausible.³⁸ Additional investigation into this potential model of contamination is warranted.

Moreover, this groundwater infiltration is in turn impacting downstream discharges. The contamination is conveyed to Recreation Pond and ultimately discharged via Outfall 010, which has extremely high levels of PFAS. From there, the contamination enters a tributary of Silver Stream. Silver Stream, when not diverted to contribute to Washington Lake, flows into the Moodna Creek, a tributary of the Hudson River. People are advised against eating any fish caught in these waters - Recreation Pond, Silver Stream, Washington Lake or Moodna Creek - due to this contamination. As DEC noted back in 2016:

*The pattern of PFOS detections in the outfall samples during high and low flow conditions, and in the inlet and outlet samples of the 17K storm sewer pipe suggests that the on-site drainage system is intercepting a PFOS groundwater plume(s) below the water table and discharging it to the ANG Base retention pond. PFOS may have been released to the soil and groundwater during historic AFFF spills and other discharges which are known to have occurred at the site.*³⁹

The ANG seeks to rule out this model of contamination by suggesting that “subsurface materials do not present a ready pathway for a groundwater plume.”⁴⁰ Again, this conclusion is not supported by evidence

³⁵ Draft Expanded SI Report at 7-1.

³⁶ *Id.* at 6-1. The Draft Expanded SI Report notes that “roughly 50 percent of the linear footage of the on-base storm drain system was inspected for dry weather flow.” *Id.* at 4-2. Plus, 280 feet of the stormwater pipe south of the Route 17K culvert could not be inspected. *Id.* at 419. The ANG must conduct a more comprehensive evaluation of the storm drain system in future investigations. This should include an evaluation of the potential impact of sediment to the system, which may be infiltrating into pipes via groundwater.

³⁷ *Id.* at 6-2.

³⁸ DEC 2016 Investigation Report at 1.

³⁹ *Id.* at 10.

⁴⁰ Draft Expanded SI Report at 2-4.

in the record. As DEC and others have pointed out, there has been no attempt to evaluate subsurface characteristics across the site, rendering any conclusion about this potential pathway premature at best. Clearly, groundwater is flowing into the storm drain and has migrated off-Base. Fractured shale bedrock at SANGB will remain an important potential migration pathway for polluted groundwater until we have data to rule this out. Data as to the subsurface characteristics throughout the Base needs to be part of any subsequent investigation.

Based on the above, it appears that a groundwater plume at SANGB may well be impacting Washington Lake through direct migration and/or through the storm drain system. The ANG's attempt to eliminate this model is simply not justified. Rather than abandoning this line of inquiry, the ANG must continue to investigate groundwater infiltration of the storm drain system. Another round of testing to examine groundwater adjacent to the pipes should be part of the next phase of the investigation.

C. The Pattern of Wet and Dry Weather Sampling Suggests that Groundwater Intrusion, not Surface WaterFlow, May be the Primary Mechanism of Contamination to Washington Lake

As stated above, dry weather flows in the storm drain system show extremely high PFAS concentrations, with one sample measuring over 4,000 ppt of PFOA and PFOS combined. There are several catch basins where these dry weather discharges exceed wet weather ones. Yet the Draft Expanded SI Report underplays the clear significance of groundwater in concluding that “[s]tormwater to surface water flow is the primary mechanism for PFAS to” Washington Lake.⁴¹ Such a conclusion, especially without any attempt to explain the extremely high levels of PFAS discharges during dry weather, is unsupported by data in the record established to date.

A more appropriate reading of the data would support the inference that, for at least some catch basins, the pattern of dry and weather sampling suggests that groundwater intrusion into the storm drain is in fact the primary mechanism for PFAS contamination, as DEC proposed four years ago. This groundwater contribution to Recreation Pond is a base load, and stormwater adds to this contamination - not the other way around. The magnitude of the additional stormwater loading varies by outfall, but even in the absence of that loading groundwater would serve to contaminate Washington Lake from Recreation Pond.

Unless the ANG can affirmatively support the conclusion that groundwater is not the primary pathway, the conclusion that stormwater to surface water is the primary mechanism must be removed from the Expanded SI Report. The next phase must include additional investigation to determine the relationship between groundwater and surface water flows.

In sum, the data does not support the conclusion that a groundwater plume is not impacting Washington Lake. This statement needs to be removed from the Expanded SI Report and the ANG must work with local and state partners to ensure that groundwater contamination is fully delineated in the next phase of the investigation.

⁴¹ *Id.* at 7-1.

D. Exfiltration and Hydraulic Connectivity at SANGB must be Understood to Inform Next Steps.

Work performed during the Expanded SI raised the possibility of exfiltration from the storm drain system to groundwater.⁴² To understand the flow of PFAS contamination at and beyond SANGB, we need to understand the dynamics of this pathway. Without this information it will be impossible to know whether exfiltration is a source of PFAS to groundwater. Given what we know about the deteriorated condition of the storm sewers, the ANG must study the impact of exfiltration to groundwater from the pipes at the same time it studies the impact of infiltration to the pipes. The nature of this relationship will impact the volume of water ultimately conveyed to Recreation Pond and beyond, which is crucial to our understanding of the flow of PFAS contamination to off-base receptors. This investigation should be conducted as part of a broader effort to understand the connectivity between groundwater, stormwater, and surface water.

E. Conclusions Are Often Based on Too-Limited Data, Including Single Samples in Some Cases

In three instances, sweeping conclusions appear to be drawn based at least in part on single samples:

- To “Evaluate Surface Water and Groundwater PFAS Contributions to and from Recreation Pond,” a single sample was collected from a single new monitoring well.
- To “Evaluate Surface water and Groundwater PFAS Contributions to Lake Washington,” a single sample was collected from a single new monitoring well, in addition to existing monitoring wells, many of which showed extensive evidence of contamination.
- To “Evaluate Soil and GW Quality at Potential Release Location (PRL) 16,” a single sample was collected from a single new monitoring well.

In addition, at least three existing monitoring wells, MW-10, MW-12, and MW-15, could not be sampled because they were dry at the time of sampling.

In each case, the paucity of data undermines ANG’s attempts to make sweeping conclusions that will impact the future of the remediation at SANGB. Clearly, any conclusions based on individual samples are unjustified and must be deleted. In general, where existing data is limited, ANG must refrain from drawing conclusions and instead flag those data categories that need to be supplemented in future investigations.

F. Landfill-area Contamination Must Be Further Studied and Remediated

Testing data for both ground and surface water in the vicinity of the landfill show SL exceedances, including measurements as high as 1,220 and 1,830 ppt combined PFOA and PFOS, more than 100 times greater than the proposed New York State MCLs. The landfill is a source of off-base contamination, and a potential pathway of contamination exists to Washington Lake via groundwater and/or Patton Brook, and

⁴² See *id.* at 4-3.

private drinking water wells via groundwater. All sources of PFAS contributing to pathways of contamination affecting identified receptors must be addressed, including the landfill area. There is sufficient evidence to identify the landfill area as a confirmed release location of PFAS because SLs are exceeded in several sample results.

G. All Receptors Must be Considered to Assess Potential Groundwater Pathways

Finally, as previously stated, because all receptors have not been considered, significant potential groundwater pathways must be studied to understand the PFAS pollution at SANGB's impact on Browns Pond, and private and public wells, including the Town of New Windsor's Kroll and Butterhill wells.

IV. Options to Adequately Treat Stormwater at Recreation Pond Must be Further Studied

Filtering contaminated Recreation Pond water prior to its discharge to a tributary of Silver Stream has been recognized since 2016 as a critical interim step in protection of public health and the environment from the PFAS contamination at SANGB.⁴³ The conclusions in the Draft Expanded SI Report that the volume of stormwater "discharging from Recreation Pond likely exceeds the ability to treat it all using conventional filtration media" and that "Recreation Pond will likely require a treatment capacity so large, that it may not be feasible given the observed site conditions" are premature given the status of remediation and unsupported by the evidence presented.

Numerous steps could be taken to minimize reliance on the filter at Recreation Pond, none of which have been implemented to date. Strategies that can address capacity concerns include, but are not necessarily limited to:

- reducing the flow of groundwater infiltrating SANGB storm sewers, via slip-lining or other methods, which would also have the result of reducing PFAS loading to Recreation Pond;
- reducing stormwater volumes, by re-routing some or all of the existing storm sewers that discharge to Recreation Pond, such as those originating from Route 17K and Stewart International Airport; and
- expanding stormwater storage capacity of Recreation Pond or building new storage capacity.

These and/or other strategies must be considered comprehensively as treatment systems are designed and implemented to meet the long-stated and still-essential goal of eliminating PFAS-contaminated discharges from Recreation Pond.

Further, in addressing these questions of capacity, it is imperative that future studies consider realistic storm scenarios. While the source of information used for analysis is the most currently up-to-date (National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 10, Version 3), analysis of stormwater-related pollution and treatment should consider future scenarios, as overall precipitation

⁴³ See Ltr. from Dan Shapley and John Parker, Riverkeeper, to Chairman John Degnan, Port Authority of New York and New Jersey & Col. Howard Wagner, Stewart Air National Guard Base (May 12, 2016).

volumes are predicted to increase, with “more frequent storm events and heavier downpours.”⁴⁴ Reliance on the historical record alone is insufficient, given the magnitude of projected changes to come.

V. Contaminated Recreation Pond Sediment Must Be Remediated

One of the conclusions in the Draft Expanded SI Report is that, “[s]ediment in Recreation Pond likely contributes PFOS and PFOA to the surface water, however, the potential contribution from sediment is relatively low compared to contributions from stormwater and surface water.” One of the models estimated combined PFOA and PFOS contribution from sediment as high as 20 grams per day. Minimizing the importance of this pathway does not serve the goal of ensuring that the community’s drinking water is safe to consume. All sources of PFAS contributing to Recreation Pond and downstream water contamination must be addressed, including sediment contamination. The reduction or elimination in groundwater- and stormwater- associated PFAS loading should be assumed, and the sediment-associated loading addressed as part of a comprehensive remediation.

Moreover, given that preliminary results indicate that sediment may be an important source of PFAS contamination, the model should be refined to improve the accuracy of future results and to minimize reliance on assumptions. This will serve to increase our understanding of sediment-to-water flux and the potential magnitude of this pathway.

VI. Investigations of Soil Contamination are Insufficient

The Draft Expanded SI Report details only 10 soil samples from three locations, which is insufficient to characterize the extent of the PFAS soils contamination for a Base that spans approximately 267 acres. The available testing data reveals that PFAS concentrations on the Base are highest in soils. PFAS have an affinity for and are highly mobile in water. Rainwater will mobilize PFAS in contaminated soil, resulting in:

- PFAS-polluted stormwater that flows through the stormwater system to discharge to Recreation Pond and beyond, and/or
- PFAS-polluted groundwater, which infiltrates stormwater system to discharge to Recreation Pond and beyond, and/or
- PFAS-polluted groundwater that flows off-base to receptors that may include Washington Lake, Browns Pond, Kroll Well, Butterhill Wells, private wells or other receptors.

The soil on the base holds the greatest volume of PFAS. This is the likely source of the PFAS in stormwater. Without addressing the massive volume of PFAS in the soil, PFAS will mobilize with every rain or snowmelt event and continue to contaminate the environment and impact human health.

VII. Additional Technical Comments and Questions

The following are miscellaneous comments and questions that warrant further consideration:

⁴⁴ DEC, *Impacts of Climate Change in New York* (last accessed July 17, 2020), <https://www.dec.ny.gov/energy/94702.html>.

- **Stormwater modeling.** The Draft Expanded SI Report describes plan deviations indicating that only one or two storms were used to inform models that will be critical in understanding the flow of pollutants into and through Recreation Pond.⁴⁵ We are concerned that too few storm events were measured to properly calibrate, as evidenced by the fact that modeling results varied quite substantially from observed values.⁴⁶ As ANG acknowledges, further data inputs and refinement is necessary.⁴⁷
- **Stormwater monitoring.** The Draft Expanded SI Report documents that stormwater monitoring stations collected flow measurements every 15 minutes.⁴⁸ Such limited measurements provides insufficient resolution for measuring flashy responses to rain in a stormwater system, particularly one with as much impervious pavement as the SANGB. It is certainly feasible to record measurements at shorter intervals, even as low as once a minute. Given the unreliability of the modeling results presented in the Draft Expanded SI Report, ANG must correct this issue.
- **General.** In several places, the report describes “significant” or “not significant” contributions of PFAS. Science increasingly shows adverse health effects at PFAS levels below 1 ppt. Thus, we believe all PFAS discharges from the Base are significant, and particularly those that exceed anticipated New York State MCLs and Water Quality Standards and the much higher SLs. While we recognize that priority actions need to be identified based on the magnitude of contamination affecting drinking water sources, any contamination that may result in an exceedance of health- and science-based thresholds at identified receptors is significant.
- **Pore water sampling.** ANG must incorporate pore water sampling in subsequent investigations. This data will serve to refine conceptual site model.⁴⁹
- **Retention basins.** The presence of glycol – or rather, the lack thereof - was used to assess PFAS contributions from the retention basins.⁵⁰ We ask for clarification and contextualization to help understand these results. In particular, the final Expanded SI Report should address the issue of whether glycol can be used as an indicator in other areas and whether there is a broader connection between glycol and PFAS? We agree that additional sampling is warranted and urge that this sampling be included in future investigations.
- **Groundwater impacts downgradient of SANGB.** The Draft Expanded SI Report notes that five of the six PFAS sampled were detected at monitoring well SLMW-21S.⁵¹ Concentrations of PFOA and PFOS exceeded New York State’s anticipated MCL and presumed Water Quality Standards, and the combination of PFOA and PFOS exceeded the ANG’s SL. Monitoring at SLMW-21S was meant to “evaluate seasonal variations for PFAS in groundwater downgradient of [SANGB],” but the Draft Expanded SI Report does not offer any explanation for what the

⁴⁵ See Draft Expanded SI Report at 4-4-4-5.

⁴⁶ See *id.* at 6-12-6-14.

⁴⁷ The Draft Expanded SI Report notes that the “all of the outfalls would benefit from further inspections to refine the inputs into the calibrated model.” *Id.* at 6-13. We concur with the conclusion that “[a]t a minimum, all of the outfall discharging into Recreation Pond would benefit from additional flow monitoring and sampling, including the collection of discrete samples throughout the event, at location upstream of the outfall to help refine the calibration.” *Id.*

⁴⁸ *Id.* at 4-5.

⁴⁹ Porewater sampling would be conducted in the surface water bodies to understand the contribution of PFAS in the sediment. It could also be a useful indicator in ecological evaluations, *i.e.* measuring impact to benthic organisms.

⁵⁰ See *id.* at 6-19.

⁵¹ *Id.*

elevated PFAS levels mean for modeling groundwater from SANGB.⁵² The exceedances must be explained in the context of groundwater migration off-base in the final Report.

- **Groundwater sampling at former base landfill.** Many of the 13 monitoring wells sampled in the vicinity of the former landfill showed exceedances of the SLs, with additional wells showing detections of PFAS. The next phase of investigation should, at a minimum, include offsite wells at similar depths to those with confirmed exceedances and detections.
- **Independent data verification and analysis.** For all data going forward, we believe independent third-party verification and analysis should be available to the RAC, in order both to expedite thorough and detailed review of data gathered and to evaluate conclusions reached based on the data gathered throughout the remediation process.
- **Revisiting previous results.** Numerous samples from earlier investigations, including the March 2019 Final Site Inspection Report Addendum, were below previous SLs but exceed the SL proposed by ANG here. These previous results need to be reassessed in the context of the more stringent SL, and all results should be periodically reassessed as the ANG adopts more health-protective SLs.

VIII. Conclusion

We believe the Department of Defense when it states publicly that “[e]nsuring the health and safety of our servicemembers, the families living on our installations, and the surrounding communities is one of our top priorities.”⁵³ Drawing the proper conclusions from the data collected for the Expanded SI and throughout the site inspection phase is a critical juncture for the future well-being of the Newburgh-area community. As the ANG notes, the data presented in Draft Expanded SI Report will be used to inform the process of “determining the most significant contributions of PFAS leaving the SANGB at Recreation Pond and ultimately impacting [Washington Lake].”⁵⁴ This data will be used to “aid in developing [interim remedial measures] and establish [data quality objectives] for the [remedial investigation] phase.”⁵⁵ Using this data wisely will set the stage for a future cleanup that protects Washington Lake and other drinking water sources while allowing the regional ecosystem to rebound from decades of contamination. While we do not dispute the critical importance of remediating and preventing future contamination of Washington Lake, we must reiterate that other receptors, including public drinking water supplies and contaminated food sources, are also of concern.

There is a distinct risk that the premature or incorrect inferences drawn in the Draft Expanded SI Report, if finalized, would narrow the scope of remediation at SANGB in ways that would be both counterfactual and unjust. The downside of that is nothing short of a perpetuation of a public health crisis. For all of us to get what we want out of this process, we must ensure that decisions are data-driven, and based on diligent good faith science in the interest of promoting public health and ecological health. Hastily ruling out plausible contamination pathways may expedite a cleanup, or make it less expensive, but it will not

⁵² *Id.* at 4-17.

⁵³ Stmt. of Maureen Sullivan, Deputy Ass’t Sec’y of Def. for Env’t., U.S. Dep’t of Defense, *in Hrg. Before the Subcommittee on Environment of the Committee on Oversight and Reform, House of Representatives, 116th Cong. at 12* (Mar. 6, 2019), <https://www.congress.gov/116/meeting/house/109020/documents/HHRG-116-GO28-Transcript-20190306.pdf>.

⁵⁴ Draft Expanded SI Report at 4-1.

⁵⁵ *Id.*

address the toxic legacy from the Air National Guard's use of PFAS at Stewart Air National Guard Base. We look forward to working with you in taking the next step to restoring the Washington Lake watershed, and other receptors affected by pollution sources at the Base.

Respectfully submitted,

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cc: Col. John M. Kelly