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**Updated Statement of Basis and Response to Comments
Renewal of Hazardous Waste Storage and Treatment Permit
ATK Launch Systems, LLC - NIROP Facility
EPA ID No. UT3170027277
October 8, 2020**

1. INTRODUCTION.

On January 31, 2019, the Director of the Utah Division of Waste Management and Radiation Control (the Division) received an application for the renewal of the Hazardous Waste Storage and Treatment Permit for the ATK Launch Systems, LLC Bacchus Facility – Navy Industrial Reserve Ordnance Plant (ATK - NIROP Facility) (DSHW-2019-001243). This Statement of Basis and Response to Comments addresses the Director's final decision to revise and renew the ATK - NIROP permit.

2. FINAL PERMIT DECISION.

Pursuant to the Utah Solid and Hazardous Waste Act, § 19-6-101, *et. seq.*, Utah Code Annotated 1953, as amended, and the regulations promulgated by the Utah Waste Management and Radiation Control Board, codified in the Utah Administrative Code R315 (R315 Rules), and pursuant to the Solid Waste Disposal Act, 42 U.S.C. § 3251, *et. seq.*, as amended by the Resource Conservation and Recovery Act of 1976, 42 U.S.C. § 6901 *et. seq.*, and the Hazardous and Solid Waste Amendments of 1984, the Director revised and renewed the hazardous waste Part B permit (Renewed Permit) issued to ATK Launch Systems, LLC¹ (ATK) and the United States Navy (collectively the Permittees) for the storage and treatment of hazardous waste on the Naval Industrial Reserve Ordnance Plant (NIROP), EPA Identification Number UT3170027277.

The Director has reviewed and considered all comments submitted during the public comment period in this decision. The Director's decision to renew the permit is based on his findings that the ATK - NIROP renewal application, the administrative record for this decision, and the

¹ Effective August 1, 2020, the permittee, ATK Launch Systems, Inc. changed its name and corporate form to ATK Launch Systems, LLC. (DSHW-2020—11282).

Renewed Permit meet all applicable requirements in the Utah Solid and Hazardous Waste Act and the R315 Rules.

Based on the comments received, ATK has agreed to re-evaluate its energetic waste and to consider alternative treatment technologies. Thus, the following additional conditions in the Renewed Permit:

- I.HH.1. Within one year of the effective date of this permit renewal, the Permittees shall submit to the Director, for approval, a written evaluation of each energetic hazardous waste stream identified in Condition IV.B.1. The written evaluation shall include:
 - I.HH.1.a. an assessment, including the basis, whether each waste stream must be treated by open burning at the NIROP Burning Grounds because of necessary safety requirements, including if the waste still may be defined as waste explosives which have the potential to detonate or as bulk military propellants;
 - I.HH.1.b. a signed certification stating the Permittees have determined each specified waste stream must be treated by open burning at the NIROP Burning Grounds because of the specified necessary safety requirements, for example the waste may be defined as waste explosives which have the potential to detonate or bulk military propellants which cannot be safely disposed through other modes of treatment, and that any health effects associated by the specified waste stream have been addressed in ATK's Human Health Risk Assessment;
 - I.HH.1.c. a permit modification to remove from Condition IV.B.1 any wastes in which the Permittees cannot certify a need to continue open burning at the NIROP Burning Grounds as required in Condition I.HH.1.b;
 - I.HH.1.d. an assessment whether each waste stream identified in Condition IV.B.1 may be safely treated with alternative technologies other than open burning; and
 - I.HH.1.e. if the Permittees determines one or more alternative technologies are viable for a specific waste stream, the Permittees shall include a proposal and schedule to implement treatment methods other than open burning. The detailed evaluation may also include the option of shipping energetic wastes to other permitted facilities for treatment or disposal.
- I.HH.2. Within one year of the effective date of this permit renewal, the Permittees shall submit to the Director, for approval, a work plan and schedule to investigate if per- and poly-fluoroalkyl substances (PFAS) are generated and released from ATK - NIROP open burning operations.

3. FACILITY BACKGROUND.

The ATK – NIROP facility is located at 5000 South 8400 West, in West Valley City, Salt Lake County, Utah. The facility is owned by the U.S. Navy, NIROP, and operated by ATK. ATK is a wholly owned subsidiary of Northrop Grumman Innovation Systems, Inc. The ATK - NIROP Facility is located within the approximately 10,000-acre boundaries of the ATK Bacchus Facility. The Bacchus Facility was established in 1915 as a producer of commercial blasting powder. In 1958, the Bacchus Facility was renovated into a solid rocket propulsion research, development and production facility. Since its inception, the Bacchus Facility has been owned by various companies.²

Currently, ATK produces and prepares propellant ingredients, manufactures solid propellants, and produces solid propellant rocket motors at the Bacchus Facility. As a result of its propellant operations, ATK generates both reactive and non-reactive hazardous waste, as defined by Utah Admin. Code R315-260. ATK may store hazardous waste at the ATK - NIROP Facility in accordance with applicable R315 Rules or the Renewed Permit. Non-reactive and certain reactive hazardous waste may be stored onsite until shipped to a permitted hazardous waste management facility. ATK routinely transports a large portion of the reactive waste generated at the Bacchus Facility to its Promontory Facility in Box Elder County, Utah. All reactive wastes transported to the Promontory Facility must meet applicable U.S. Department of Transportation (U.S. DOT) and hazardous waste shipping requirements.³ Reactive wastes that remain at the Bacchus Facility for open burning are difficult to ship because they are odd sized, generated in small quantities, have explosive safety hazards, or are prohibited from transport as a “forbidden explosive” as defined in 49 C.F.R. § 173.54. The Renewed Permit allows ATK to thermally treat certain reactive hazardous waste and reactive contaminated waste at the NIROP Burning Grounds pursuant to requirements in the permit.

4. PERMIT APPLICATION REVIEW SUMMARY.

- a. The Division issued the original permit in September 2009, which was last modified in 2018.
- b. The Division determined the permit renewal application was complete in accordance with Utah Admin. Code R315-15-270-10(c)(2).
- c. The Renewed Permit is based on the premise that the information submitted in the original permit application, as modified by subsequent amendments, permit modification

² Hercules, Inc. established the Bacchus Works in 1915. Alliant Techsystems, Inc. purchased Hercules Aerospace, including the Bacchus Facility in 1995. Orbital Sciences Corporation merged with Alliant Techsystems, Inc. Defense and Aerospace Division in February 2015 to form Orbital ATK, Inc. Northrop Grumman Corporation acquired Orbital ATK, Inc. in June 2018.

³ Explosives, including explosive waste may be transported only if “it has been tested and classed and approved by the Associate Administrator for Hazardous Materials Safety.” See 49 U.S.C. § 173.51.

requests received throughout the term of the original permit, supporting documents, and the permit renewal application, as modified by subsequent amendments, is accurate.

- d. Following a review of the permit renewal application, the Director found that the application reasonably met all applicable provisions of Utah Admin. Code R315-264 and R315-270. Subsequently, the Division prepared a draft permit renewal for the Part B Hazardous Waste Storage and Treatment Permit for the ATK - NIROP Facility.
- e. The Renewed Permit included necessary conditions and procedures for ATK to manage three hazardous waste container storage units – ES-2, ES-3, and Ash Storage Plant and a thermal treatment unit – NIROP Burning Grounds in accordance with applicable R315 Rules.
 - i. The ES-2 container storage unit is a totally enclosed concrete and steel structure with a sprinkler system. ATK may store up to 40,000 pounds of explosive waste in the ES-2 container storage unit.
 - ii. The ES-3 container storage unit is a totally enclosed concrete and timber structure with a sprinkling system. ATK may store up to 25,000 pounds of explosive waste in the ES-3 container storage unit.
 - iii. The Ash Storage Pad is a 45-foot x 45-foot concrete pad located outside of the NIROP Burning Ground fence used to store trash and scrap metal generated at the NIROP Burning Grounds in one of two containers.
 - iv. The NIROP Burning Grounds consists of 17 burn pans used to treat reactive waste surrounded by five-foot high earthen berms in a five-acre area. The 1/4 to 3/8-inch thick carbon steel burn pans are placed on an asphalt containment area. Each pan has a leachate collection system. Two burn cages also treat waste lightly contaminated with explosives such as nitroglycerin or HMX that cannot be transported off site.⁴
- f. The Renewed Permit is organized as follows:
 - i. Module I – Standard Conditions
 - ii. Module II – General Facility Standards
 - iii. Module III – Storage in Container
 - iv. Module IV - Thermal Treatment of Energetic Wastes
 - v. Attachment 1 – List of Acronyms

⁴ An Approval Order issued by the Division of Air Quality on September 18, 2019 limits the open burning operation to treating up to 4,500 pounds per day of scrap explosive and hazardous material. When Salt Lake County has issued a “no burn” order, then ATK may only treat up to 400 pounds of unstable waste, including nitroglycerin waste, laboratory waste, and unburned waste from a previous burn attempt.

- vi. Attachment 2 – Part B Operation Plan – Facility Description
- vii. Attachment 3 – Waste Analysis Plan
- viii. Attachment 4 – Part B Operation Plan – Process Information
- ix. Attachment 5 – Procedures to Prevent Hazard
- x. Attachment 6 – Contingency Plan
- xi. Attachment 7 - Personnel Training Plan
- xii. Attachment 8 – Closure Plan
- xiii. Attachment 9 – Soil Monitoring Plan

5. PUBLIC PARTICIPATION.

- a. Public Comment Period. The Division offered a Fact Sheet and the draft Renewed Permit for review and public comment beginning on June 16, 2020 through July 31, 2020 at 5:00 p.m. MDT. The Fact Sheet summarized changes in the draft Renewed Permit.
- b. Public Hearing. The Division held a virtual public hearing at 5:00 p.m. MDT on July 15, 2020.
- c. Public Comments. The Division received comments from 52 individuals, three of which represent organizations during the comment period. Nine individuals submitted comments after the close of the comment period; nevertheless, the Director considered all 52 comments in his decision. Notice of the Directors final permit decision will be sent to the 15 commenters that provided a mailing address.

6. RESPONSE TO COMMENTS.

- a. Director's Statement.

I appreciate each commenter taking the time and interest to review the ATK - NIROP draft renewal permit and to make comments. The Resource Conservation and Recovery Act (1976) and subsequent federal rules (40 C.F.R. § 265 (May 19, 1980)) granted ATK's predecessor, Hercules, Inc. and the U.S. Navy the ability to continue storing and open burning hazardous waste in accordance with promulgated regulations until 1992 unless it filed a hazardous waste permit application and ultimately received a Part B permit. A timely Part B permit application was filed. Notwithstanding that 52 out of 53 commenters oppose issuance of the Renewed Permit, under law, I have no scientific or regulatory basis to deny the permit or mandate ATK - NIROP use a different technology if it can demonstrate it meets the performance and permitting standards developed by the EPA and adopted by Utah. The Division will continue to oversee the Reissued Permit to ensure compliance with the permit and any new regulatory requirements. Notably, ATK has agreed to continue to minimize the types of waste open burned, to evaluate the waste for potential sources of PFAS, and to evaluate and potentially initiate the use of alternative technologies instead of open burning.

b. Comments regarding the legal standard applied to ATK - NIROP open burning.

- i. Interim status rules. Commenter 1 (Laura Olah), states “Title 40, Section 266.382” provides “open burning of hazardous waste is prohibited except for open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot be safely disposed through other modes of treatment.”

Commenter 1’s citation is incorrect. Title 40 § 266.382 does not exist. The correct citation is 40 C.F.R. § 265.382 which addresses interim status open burning requirements.⁵ Interim status rules specify minimum standards that are generically applied to all hazardous waste facilities, based on a type of facility such as open burning, until such time that a facility is permitted under Utah Admin. Code R315-264 and R315-270 or closed. The provisions of 40 C.F.R. § 265.382 do not apply to the ATK - NIROP Burning Grounds, instead ATK must meet the part B permit requirements specified in Utah Admin. Code R315-264-601 (or 40 C.F.R. § 264.601). The Utah Admin. Code R315-264-601 permitting standards require ATK to demonstrate its site specific open burning operations meet the health and environmental based performance standards. While not specifically required, the Division, as the permit writer, may consider certain interim status requirements if applicable when drafting the permit.

- ii. Until EPA changes its rules, open burning remains a legal option under federal and state law. Commenter 19 (U.S. Environmental Protection Agency, Region VIII) quotes an EPA report⁶ stating “[t]he variance allowed treatment by [open burning/open detonation] only during the interim status period and only until additional viable technologies could be developed.” Region VIII adds that “‘ . . . the Agency (EPA) regards the Subpart X rule as a means of allowing flexibility for technological development and innovation’ and was not intended to perpetuate the use of . . . [open burning].”⁷ Region VIII further asks whether ATK provided a justification to continue open burning or whether ATK conducted an evaluation of alternative technologies.

As discussed above, notwithstanding commenters desire to impose another treatment method than open burning, current federal and state law allow ATK to continue to open burn its waste if it meets the performance standards specified in R315-264-601. EPA provided no specific comments regarding meeting applicable performance standards. Additionally, although, Region VIII’s comments quote the EPA Alternative Technology Report, that open burning was allowed “only” during interim status and “only” until other technology was developed, the report clearly states that the report “does not substitute for . . .

⁵ The State of Utah adopted and incorporated by reference 40 C.F.R. § 265.382. See Utah Admin. Code R315-265.

⁶ *Alternative Treatment Technologies to Open Burning and Open Detonation of Energetic Hazardous Wastes, Final Report,* (EPA Alternative Technologies Report) EPA 530-R-19-007 (December 2019).

⁷ Citing 52 Fed. Reg. 46946, 46947 (December 10, 1987).

RCRA, or other regulations, nor is it a regulation itself. Thus, it *does not impose legally binding requirements* on EPA, States, or the regulated community, and may not apply to a particular situation based upon the circumstances (emphasis added).⁸

Moreover, while “the Agency [expressed in the preamble it] regards the Subpart X rule as a means . . . for technological development and innovation,” nowhere did it state that open burning should not be permitted.⁹ To the contrary, the preamble concludes “the Agency believes that the generic permitting standards under Subpart X would be just as applicable to open burning . . . as any other Subpart X unit.”¹⁰ EPA, in fact, specifically identified open burning of explosive wastes as an example of a unit covered under Subpart X.¹¹ EPA also acknowledged to the National Academies that it “has no current regulation or policy that prohibits or limits the issuance of [hazardous waste Part B] permits for [open burning] facilities or that promotes alternative technologies.”¹²

While Region VIII implies ATK must provide (1) a justification for continued open burning and (2) an alternative technology assessment, the current law does not require either. If practical and viable, the Division agrees that a treatment alternative treatment technology for explosive wastes that eliminates emissions is indeed desirable; but if EPA did intend to require alternative technologies and eliminate the option of open burning as asserted by Region VIII, it must change its rules. Under current law, the Division will continue to oversee and enforce the Reissued Permit and encourage ATK to explore other technologies.

c. Management of hazardous waste generated by ATK.

Commenters are concerned with the emissions and health effects from the open burning of explosive waste and propellants. In reading the response to comments, it may be beneficial to understand how ATK manages its hazardous waste at the ATK - NIROP Facility. As a result of its propellant operations, ATK generates both reactive and non-reactive hazardous waste, as defined by Utah Admin. Code R315-260. The explosive or propellant wastes classified as Division (or Class) 1.1 explosives which have a mass explosion hazard affecting almost the entire load instantaneously, e.g., extremely shock sensitive nitroglycerin; and Division (or Class) 1.3 explosives which have a fire hazard

⁸ EPA Alternative Technologies Report at i.

⁹ See generally, 52 Fed. Reg. 46947-46962.

¹⁰ 52 Fed. Reg. at 46948.

¹¹ 52 Fed. Reg. at 46951-52.

¹² *Alternatives for the Demilitarization of Conventional Munitions*, the National Academy of Science, Engineering and Medicine (NASEM) (2019) at 10 (citing response provided via e-mail on October 20, 2017, by K. Shuster, engineer, senior technical expert, U.S. EPA). Since the publication of the NASEM report, EPA has published its EPA Alternative Treatment Technologies Report.

and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.¹³

1. NIROP Burning Grounds. Reactive waste treated at the NIROP Burning Grounds are either difficult to ship or prohibited from shipment because the wastes are odd sized making it difficult to handle, generated in small quantities, or have explosive safety hazards. For example, ATK must treat certain waste explosives or propellants at the NIROP Burning Grounds due to (1) the waste being time-sensitive and may become unstable or (2) transportation of the waste is prohibited under U.S. DOT rules, 49 C.F.R. § 173.54 as a “forbidden explosives,” e.g., nitroglycerin, unstable propellants, or an explosive that has not been approved for transportation by the U.S. DOT.
2. Explosive Waste Transported Off-Site for Treatment. Most of the Division 1.3 explosive wastes and a portion of the Division 1.1 explosive wastes generated at the ATK Bacchus Facility are transported to ATK’s Promontory Facility in Box Elder County. All reactive wastes transported to the Promontory Facility must meet applicable U.S. DOT approved shipping requirements and applicable hazardous waste rules.¹⁴ For 2020, the Bacchus Facility generated 202,825 pounds of explosive waste of which it open burned 24.73 % at the NIROP Burning Grounds and 75.27 % at the Promontory Facility. In 2019, 31.23% of the explosive waste generated at the Bacchus Facility was open burned at the NIROP Burning Grounds and 68.77 % was treated at the Promontory Facility.¹⁵
3. Other ATK generated hazardous waste that are not waste explosives or military propellants are all shipped off-site for treatment or disposal at hazardous waste permitted facilities.

d. Remaining comments.

The Division addressed the remaining comments under the following five areas:

- Stop the open burning which causes a risk to human health and the environment.
- Use an alternative treatment technology.
- Eliminate certain waste streams from open burning.
- Open burning can cause PFAS contamination.

¹³ See 49 C.F.R. §§ 173.50; 173.53.

¹⁴ “The shipping containers and transportation handling techniques for all explosive materials and wastes must be examined as per [U.S. DOT] 49 CFR 173.51 or an authorized military agency prior to shipment.” See Renewed Permit, Attachment 4 at ¶ 4.5.1. Explosives, including explosive waste may be transported only if “it has been tested and classed and approved by the Associate Administrator for Hazardous Materials Safety.” See 49 U.S.C. § 173.51.

¹⁵ Email from Kris Blauer to Hao Zhu, forwarding email from Robert Weston (September 22, 2020).

- Open burning causes perchlorate contamination in the groundwater.
- e. Comments Addressing the Risk of Open Burning Operation at the NIROP Burning Grounds.

In addition to six commenters who opposed permit reissuance without stating a basis, the remaining 46 commenters also opposed reissuance because of general health or environmental concerns.

- i. Risk Assessment. ATK relied upon a site-specific Risk Assessment¹⁶ to demonstrate that open burning of waste explosives and propellant at the NIROP Burning Grounds meet applicable performance standards specified in R315-264-601. The emissions modeled in the Risk Assessment were based on the specific types of waste that may be open burned under the Reissued Permit, defined as hazardous waste due to their reactivity,¹⁷ e.g., explosive or propellant wastes. An EPA accepted dispersion model estimated the distribution and deposition of possible pollutants. The model considered all known chemicals that potentially could be emitted by ATK's explosive wastes (Class 1.1 and 1.3) during open burning operation. Various emission studies confirmed the potential emission constituents released, emission concentrations and the rate of release for ATK specific explosive waste.¹⁸ Considering a conservative estimate of the projected distribution, concentration, and deposition of pollutants, the Risk Assessment calculated the estimated health effects to the public based on the potential human exposure concentrations.¹⁹
- ii. Risk Assessment Findings. The Risk Assessment, based on conservative and health protective assumptions, estimated total cancer risk at 2×10^{-9} and a total non-cancer Hazard Index at 0.01 for both adult and child receptors if residing at

¹⁶ The Risk Assessment was conducted using a three-tiered approach – Tier 1 a conservative initial screening evaluation; Tier 2 a more refined screening analysis, and Tier 3 an extensive site-specific risk assessment. Calculations were performed in accordance with guidance in the *North Carolina Protocol for Performing Indirect Exposure Risk Assessments for Hazardous Waste Combustion Units* (Research Triangle Institute, January 1997) and the *Risk Assessment Guidance for Superfund* (RAGS) (U.S. EPA, 1989).

¹⁷ Pursuant to Utah Admin. Code R315-261-23, “a solid waste exhibits the [hazardous waste] characteristic of reactivity if . . . [i]t is normally unstable and readily undergoes violent change without detonating, [i]t reacts violently with water, [i]t forms potentially explosive mixtures with water, . . . [i]t is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement, [i]t is reasonably capable of detonation or explosive decomposition or reaction at standard temperature and pressure, [i]t is a forbidden explosive as defined in 49 CFR 173.54 or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.”

¹⁸The emission factors of open burning were derived from a series of complex Bang Box and Bang Box/ODOBi studies for ATK's waste streams for both Class 1.1 propellant and Class 1.3 waste. The off-site concentrations of open burning emissions from Class 1.1 explosives were estimated using the Open Burning and Open Detonation Model with the specific regional terrain and weather conditions. The off-site concentrations from open burning Class 1.3 explosive waste were estimated using the Open Burning and Open Detonation Model combined with the AERMOD dispersion model.

¹⁹ The risk was evaluated for chronic (long-term) exposure which includes soil ingestion, consumption of above-ground produce, consumption of animal products (beef and cow-milk), ingestion of human milk, and direct inhalation in the areas of impact.

the property fence line.²⁰ Consistent with the EPA standards, the Risk Assessment must demonstrate it meets the target risk levels of cancer risk less than one in a million or 1×10^{-6} and noncancer Hazard Index less than or equal to 1, for residential receptors in accordance with Utah Admin. Code R315-101. Based on the findings from years of risk assessment efforts in quantifying the risk associated with open burning, the Division determined ATK demonstrated it met the applicable performance standards.

iii. Renewed Permit Based on Risk Assessment Findings.

Based on the Risk Assessment, the Renewed Permit imposed certain conditions on the open burning operations at the NIROP Burning Grounds, including the quantity and type of wastes treated, wind direction and speed, weather conditions, and addressing winter inversion days. In addition, the burn operations are also restricted under an Approval Order issued by Utah Division of Air Quality.

1. Permit Requires ATK to Annually Review and Verify Risk Assessment Assumptions. To ensure the continued applicability of the Risk Assessment, the Renewed Permit requires that ATK annually submit to the Director a report on its open burning operations. Among other requirements, the report requires ATK to (1) provide an accounting of the volume and types of waste open burned, (2) verify that the waste treated in the previous year were at or below the concentrations estimated in the Risk Assessment, and (3) to determine the need to update assumptions in the Risk Assessment, including emission factors, slope factors, and reference doses for carcinogenic and non-carcinogenic health effects and acute reference doses related to the compounds identified as risk driving compounds of concern to determine if assumptions have changed since the previous annual review.
2. Annual Soil Sampling Condition. The previous permit mandated ATK conduct soil sampling each year during 2010 to 2015, and again in 2020 for the NIROP Burning Grounds at locations potentially affected by open burning activities. The Renewed Permit requires ATK to continue

²⁰ The residential receptors were assumed to be present at the point of the highest off-site exposure for the Tier 1 analysis. Based on the rigorous air dispersion modeling and deposition modeling for the open burning of reactive wastes at the NIROP site and under the off-site residential scenario, the highest off-site exposure point was at the property fence line; although the fence line border surrounding the facility is in an area zoned for commercial/industrial uses. Because there is no actual residential receptor at this location, additional conservatism is introduced into the final risk numbers. In addition, a hypothetical subsistence farmer scenario was evaluated in the Tier 2 analysis as the average exposure assuming ingestion of farm milk and beef for 40 years in the agricultural zone. There is no subsistence farmer in the area at the present time and unlikely in the future due to rapid land development in the area.

conducting the soil monitoring in areas with the highest off-site impact on a five-year basis.

- a. No Increase of Dioxins and Furans Above Background Concentrations. Based on the emission Bang Box/OBODi studies and the air dispersion and deposition modeling, dioxins and furans were determined to be the risk driver for open burning activities in comparison with all other semi-volatile and volatile organic compounds. Based on the annual soil samples, no data showed concentrations of dioxin and furans have increased beyond background concentrations. Background concentrations are one to three orders of magnitude higher than the soil concentrations estimated from air dispersion modeling from the NIROP Burning Grounds Risk Assessments.
- b. Perchlorate Not Detected. Additionally, perchlorate has not been detected in any of the soil monitoring samples. These results are consistent with the ODOB_i studies which determined that perchlorate is completely burned during treatment as no perchlorate was detected in the ODOB_i emission samples.
- c. Hydrochloric Acid Emission. The Risk Assessment modeled the distribution of hydrogen chloride emissions from the NIROP Burning Grounds and determined there are no health effects from hydrogen chloride for both adults and sensitive groups at the fence line.^{21, 22}
- d. Other Chemicals of Concern. The Risk Assessment determined that the majority of the total risk was from contributions from dioxins and polycyclic aromatic hydrocarbons (PAHs). Several other chemicals of concern evaluated in the risk assessment were reported as non-detect and their contribution to total risk was considered not significant and therefore, met the performance standard.

3. Explosive Waste Contaminated with Solvents.

- a. ATK may generate rags contaminated with explosive waste and residual concentrations of solvent from wiping down slum pot

²¹ The Risk Assessment considered the EPA inhalation reference dose and the reference concentration for hydrogen chloride.

²² Also note, the Approval Order from the Utah Division of Air Quality limits the quantity of propellant open burned each day and the 12-month rolling average of the release of hydrochloric acid and chlorine to an allowable level under the Clean Air Act. The volume of propellant approved for open burning at the NIROP Burning Grounds is based on a site-specific plume height study and calibration of the Products of Combustion and Dispersion model.

collection containers to reuse the containers.²³ Soap and water are primarily used to clean slum pots but a solvent may be required if HMX cannot be removed with soap and water.²⁴

- b. ATK may also open burn research or analytical laboratory explosive waste that contain solvents in the NIROP Burning Grounds. The laboratory waste is explosive waste with no free liquids.
- c. An independent third party, authorized by the U.S. DOT, conducts a series of tests to classify ATK energetic waste streams as explosive to determine, in part, whether the waste stream may be transported off-site. The third party must reclassify each waste stream if there is a change in the process in generating the waste. ATK characterizes the solvent portion of the waste based on generator knowledge of the solvent used.
- d. Based on meeting the performance standards, ATK may open burn explosive laboratory waste and rags contaminated with both residual solvent and explosive waste in the NIROP Burning Grounds if the waste cannot be safely disposed by other means. EPA clarified that “[t]he open burning of solvents is strictly prohibited” unless “the waste solvent is a waste explosive that has the potential to detonate.”²⁵ For example, ATK nitroglycerin contaminated rags are classified as a forbidden explosive under U.S. DOT rules and may not be transported. Also, the Risk Assessment considered all chemicals of concern and determined residual solvents did not add significant risk.

f. **Comments Requesting Alternative Treatment Technologies.**

Thirteen commenters demanded or urged open burning be replaced with alternative technologies. Commenter 1 described a few generic alternative technologies. Commenter 19 (EPA Region VIII) asserts that “[s]ince the previous renewal of the ATK - NIROP permit, new technologies have been developed and brought to market that can *likely* treat all the waste streams currently treated via OB at ATK - NIROP safely and efficiently.” (emphasis added).

- i. The Division understands that new technologies have recently been developed which may possibly treat the types of waste generated at the NIROP site. The

²³ Slum pots are aluminum containers that collect contaminated materials, e.g., rags, gloves, personal protective wear. See Renewal Permit, Attachment 4.

²⁴ ATK no longer uses butyrolactone to wipe down HMX slum pots.

²⁵ Memorandum from Sylvia K. Lowrance to Robert L. Duprey (May 18, 1988).

Division further agrees that controlling or eliminating emissions from the treatment of reactive waste at NIROP is desirable. Nevertheless, as discussed above, without a rule change, if ATK - NIROP demonstrates it meets the performance standards specified in 40 C.F.R. § 264.601 then open burning is a treatment option provided by the EPA under current law, adopted by the State of Utah.

- ii. EPA Region VIII states that new technologies “can likely treat all the waste streams” at ATK - NIROP. In its comments, EPA did not provide an evaluation of which available technologies could treat specific waste streams generated by ATK; instead it relied upon generic findings from a “consensus study report” of the National Academy of Sciences, Engineering and Medicine (NASEM) – *Alternatives for the Demilitarization of Conventional Munitions* (NASEM Report) (2019). The NASEM evaluated the landscape of technologies and found that contained burning alternative treatment technologies are available, including burn chambers with pollution control equipment. However, it is critical to understand that the NASEM also recognized that replacing open burning is not as simple as identifying a possible contained burning alternative. The NASEM state that “ . . . alternative technologies, by their nature, release far fewer emissions into the environment. . . . [but] [t]here is the possibility of an increased safety risk to workers owing to additional handling requirements . . . with many of the alternative technologies, such as . . . size reduction . . . ”²⁶ The ATK - NIROP waste treated by open burning may not require extensive additional handling, but an alternative treatment must be evaluated in its totality prior to mandating implementation.
- iii. ATK has agreed to evaluate alternative technologies; thus, a compliance schedule has been added to the Renewal Permit to hold ATK to its commitment to evaluate alternative technologies at the NIROP Burning Grounds to treat energetic hazardous waste in the future.

g. Comments regarding waste handling.

- i. As a permit condition based on the site-specific Risk Assessment, open burning at the NIROP Burning Grounds is limited to treating a maximum of 80 tons per year, of which 78 tons per year may be Class 1.1 waste and 2 tons per year may be Class 1.3 waste. In recent years, ATK has utilized its treatment of energetic wastes at about 60% of the maximum treatment.

Class 1.3 contaminated waste materials such as rags, gloves, and personal protection equipment (PPE) that contain propellant are also burned at the NIROP Burning Grounds. Much of this material has been contaminated through work activities with 1.1 explosive propellant which is a safety concern

²⁶ NASEM Report at 1.

due to liquid separation of nitroglycerin in the waste. Constant efforts have been instituted in the form of Waste Minimization and Pollution Prevention at ATK to reduce the amount of energetic waste burned, including PPE.

- ii. ATK is also in the process of evaluating alternative treatment options for disposal of PPE that includes leaching and subsequent water treatment, possible shipment of waste to an offsite incinerator, and contained burn/flashing furnaces. In addition, ATK is currently reclassifying PPE wastes as 1.4 explosives so that it can be shipped to an offsite facility for treatment.
- iii. A compliance schedule has been added to the permit which requires ATK to evaluate each waste stream to determine how it could be removed or decreased from open burning operations.

h. PFAS Generation.

Because the draft Renewal Permit allows ATK to treat rocket motor initiating devices and the commenter's suggestion that ATK may use aqueous film-forming foam, commenter 1 raised concerns that PFAS will be formed and dispersed. Commenter 2 and six other commenters raised similar concerns.

- i. Per and Polyfluoroalkyl Substances (PFAS) is not a hazardous waste regulated under the R315 Rules or equivalent EPA rules. Nevertheless, the Division and ATK agree that the potential to release PFAS from open burning at the ATK - NIROP Burning Grounds should be assessed.
 - ii. In response to commenter 1, the generation of PFAS from aqueous film-forming foam is not a concern as it is not used by ATK.
 - iii. ATK does not routinely burn wastes containing Teflon that could potentially produce PFAS at the NIROP Burning Grounds. Now that PFAS analytical methods have advanced in recent years, ATK has agreed to investigate which wastes could produce PFAS or could release PFAS emissions from the open burning operation. See Reissued Permit condition I.HH.2.
- i. **Perchlorate Contamination in Groundwater.**

Commenter 1 stated that ammonia perchlorate is an active ingredient in rocket propellants and described health effects related to high levels of perchlorate exposure. Commenter 2 asserts that "burned waste contains toxic perchlorate, which often contaminates nearby drinking water wells." Commenters 1, 2, and ten other commenters raised concerns with perchlorate, including contamination in groundwater.

- i. Perchlorate contamination in groundwater at the site and downgradient of the site is a result of past practices other than open burning that occurred 40-50 years ago at the Bacchus Facility. The contamination resulted from wash down

water from manufacturing of propellants discharged directly into numerous unlined earthen ditches and sumps at the facility prior to current environmental regulations. In 1988, ATK's previous owner Hercules, Inc. entered into Stipulation and Consent Order, No. 8606396, in part, to implement groundwater monitoring, to investigate releases and contamination from past practices, and to implement corrective action. It was determined that wash down water entered the subsurface causing the groundwater contamination in the Magna City water supply. As a result of corrective action requirements, ATK has implemented a treatment system to remove perchlorate from the city water supply.

Groundwater monitoring and treatment has been ongoing for many years. The Division oversees corrective action, including groundwater remediation, related to the past practices at the Bacchus Facility under a separate hazardous waste Part B permit issued to ATK Launch Systems Inc.,²⁷ effective September 25, 2019.

- ii. No perchlorate detected from open burning. As discussed above, perchlorate has not been detected in the emission studies nor the annual soil monitoring program. At this time, there is no data that confirms the open burning at the NIROP Burning Grounds has contributed to the perchlorate contamination in the groundwater.

²⁷ The Division oversees corrective action, including groundwater remediation, related to the past practices at the Bacchus Facility under a separate hazardous waste Part B permit issued to ATK Launch Systems Inc., effective September 25, 2019