west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Entire Document
NON-CONFIDENTIAL

Application No.:	R13-0898C
Plant ID No.:	057-00011
Applicant:	Alliant Techsystems Operations LLC (ATO)
Facility Name:	Orbital ATK Allegany Ballistics Laboratory
Location:	Mineral County
SIC/NAICS Code:	3764/336415
Application Type:	Modification
Received Date:	December 2, 2015
Engineer Assigned:	Joe Kessler
Fee Amount:	$3,500
Date Received:	December 2, 2015
Complete Date:	February 1, 2016
Due Date:	May 1, 2016
Applicant Ad Date:	January 14, 2016
Newspaper:	*News Tribune*
UTM's:	Easting: 686.5 km Northing: 4,381.2 km Zone: 17
Latitude/Longitude:	39.561/-78.833
Description:	Addition of a second methylene chloride recovery unit on the nitrate ester sparging operation.

COPY

The Allegany Ballistics Laboratory was originally constructed during World War II as part of the Kelly Springfield Tire Company located in nearby Cumberland, Maryland. Because of rubber shortages, the primary product at the site at the time was mortar shells. Since that time, many additions, process changes, and ownership changes have taken place at the facility. The first 45CSR13 permit was issued for a process at the facility in 1978. Many more permits covering different sections, emission units, and processes at the facility have been issued since that time. Permit Number R13-0898 was issued on December 29, 1986 for nitrate ester sparging operations in Building 352. Since that time R13-0898A and R13-0898B were issued to ATO as Class I Administrative Updates to incorporate requirements from their 45CSR27 Consent Order (CO-R27-99-23-A(91)).

DESCRIPTION OF PROCESS/MODIFICATIONS

Existing Facility Description

Building 352 of the Allegany Ballistics Laboratory is used to air-sparge methylene chloride (1-4S) out of nitroglycerin based mixtures call "lacquers." Methylene chloride is added to nitroglycerin as a desensitizing agent to allow for safe transport over the roads from the manufacturing facility to the ATO facility. Upon receipt, the desensitized material is combined with nitrocellulose and other liquid explosives to create the lacquers. Before the lacquers can be used in the production of propellants for rocket motors, the methylene chloride must be removed. This is achieved by bubbling air through the lacquer to drive off the solvent. The solvent is then routed through an existing cryogenic recovery system (1-2C) that was originally installed in 1989. The sparging process for a single lacquer is a 4-5 day process. The methylene chloride cryogenic recovery system utilizes a low-temperature refrigeration system to condense and recover VOCs from the effluent stream.

Proposed Modifications

ATO is now proposing (after-the-fact, the control system was added in November 2015) to add a second methylene chloride cryogenic recovery system to control emissions from the nitrate ester sparging operations (1-10C). A second recovery system will be installed to supplement the existing unit. This will allow more process flexibility because there is a defrost cycle for each lacquer processed to remove ice from the system. Ice forms in system from moisture in the nitroglycerin. Approximately 25 pounds of water are removed from each lacquer processed. The defrost cycle must be completed with each lacquer to maintain recovery efficiency. The defrost cycle varies dependent upon the time of year and whether it is completed at ambient temperature or using heated air for the cycle. The minimum defrost cycle is 24 hours but is typically 4-5 days. The second system would also act as a backup to the aging system currently in use. The existing unit has been running at a recovery efficiency of 90-92% and the new unit is expected to achieve the same rate (however, to be conservative, the a minimum of 80% recovery efficiency is used in the emission calculations for both units). There are no plans to use both systems at the same time for recovery. However, concurrent use could come in the form of running the defrost cycle on one unit while the other unit is in an active recovery mode. The maximum emission limit of 3,990 pounds of methylene chloride per year will not be changes as a result of this after-the-fact change. The addition of the second control system creates no new emissions.

SITE INSPECTION

Due to the nature of the proposed modification, the author did not perform a site inspection of the facility for this permitting action. The facility was last inspected by DAQ Compliance/ Enforcement (C/E) Inspector Karl Dettinger of the North Central Regional Office on July 1, 2014. This inspection found the facility be "Status 30 - In Compliance."

AIR EMISSIONS AND CALCULATION METHODOLOGIES

ATO did not request any change in the potential-to-emit (PTE) of the nitrate ester sparging operations as a result of the permitting action evaluated herein. The second methylene chloride cryogenic recovery system (1-13E) will have the same minimum guaranteed recovery efficiency as the existing unit (80%) and no increase in production was requested. Based on information from the most recent Title V (R30-05700011-2014) Fact Sheet, the facility-wide PTE remains as given in the following table:

Table 1: Facility-Wide PTE

Pollutant	tons/year
NO_X	146.01
CO	162.69
VOC	113.03
PM_{10}	23.33
SO_2	289.50
HAPs	59.80

REGULATORY APPLICABILITY

The following will discuss each rule applicable or potentially applicable to the evaluated herein.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed modification of the Orbital ATK Allegany Ballistics Laboratory does not have the potential to increase the emissions of a regulated pollutant. Therefore, the proposed changes would normally be eligible to be reviewed as a Class II Administrative Update. However, ATO voluntarily submitted the application as a modification and it was reviewed as such. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, ATO is required to obtain a permit under 45CSR13 for the modification of the Allegany Ballistics Laboratory.

As required under §45-13-8.3 ("Notice Level A"), ATO placed a Class I legal advertisement in a "newspaper of *general circulation* in the area where the source is . . . located." The ad ran on January 14, 2016 in the *News Tribune* and the affidavit of publication for this legal advertisement was submitted on January 14, 2016.

45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration

The Allegany Ballistics Laboratory is an existing major stationary source under 45CSR14 and the proposed installation of a methylene chloride recovery unit is considered, pursuant to §45-14-2.40, a "*physical change* or a change in the method of operation." Therefore, to determine if the project is defined as a "major modification," pursuant to §45-14-3.4(a), the project is examined under a two-step applicability test: "[A] project is a major modification for a regulated NSR pollutant if it causes two types of emissions increases -- a significant emissions increase (as defined in subsection [§45-14-2.75]), and a significant net emissions increase (as defined in subsections [§45-14-2.46] and [§45-14-2.74]). The proposed project is not a major modification if it does not cause a significant emissions increase. If the proposed project causes a significant emissions increase, then the project is a major modification only if it also results in a significant net emissions increase."

Therefore, for the proposed changes to meet the definition of a major modification, the changes themselves must result in a significant emissions increase. The methodology for calculating the emissions increase under the first step is given under Sections §45-14-3.4(b), 3.4(c), 3.4(d) and 3.4(f). The substantive language relevant to the changes evaluated herein is given below:

> [§45-14-3.4(b)]
> The procedure for calculating (before beginning actual construction) whether a significant emissions increase (i.e., the first step of the process) will occur depends upon the type of emissions units being modified, according to subdivisions 3.4.c through 3.4.f.
>
> [§45-14-3.4(c)]
> Actual-to-projected-actual applicability test for projects that only involve existing emissions units. -- A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the projected actual emissions (as defined in subsection 2.63) and the baseline actual emissions (as defined in subdivisions 2.8.a and 2.8.b), for each existing emissions unit, equals or exceeds the significant amount for that pollutant (as defined in subsection 2.74)

As the total PTE associated with the nitrate ester sparging operations covered under proposed Permit Number R13-0898C is equal to approximately 2.0 TPY of VOCs, any actual increase in emissions associated with the proposed changes (not anticipated) is below the significant thresholds under 2.74 and, therefore, the proposed changes are not defined as a "major modification" under 45CSR14.

45CSR27: To Prevent and Control the Emissions of Toxic Air Pollutants - (NON APPLICABILITY)

Pursuant to §45-27-3.1, the "owner or operator of a plant that discharges or may discharge a toxic air pollutant into the open air in excess of the amount shown in the Table A [of 45CSR27] shall employ [Best Available Technology] at all chemical processing units emitting the toxic air pollutant." As noted above, Permit R13-0898B incorporated the requirements of 45CSR27 Consent Order CO-R27-99-23-A(91) - which required the installation of the methylene chloride recovery unit (which, in turn limited the facility-wide emissions of methylene chloride to amounts below the 45CSR27 trigger level). Therefore, the facility is not subject to 45CSR27.

45CSR30: Requirements for Operating Permits

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The Allegany Ballistics Laboratory, defined under Title V as a "major source," was last issued a Title V permit on July 29, 2014. Proposed changes evaluated herein must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the proposed presses and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. No additional, or increases in existing, regulated non-criteria pollutants will be emitted as a result of the changes evaluated herein. The only HAP emitted by the nitrate ester sparging operation is methylene chloride. The following table lists methylene chloride's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 2: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification/Comments
Methylene Chloride	VOC	Yes	Likely to be carcinogenic to humans

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals.* For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACT ANALYSIS

The proposed modification does not meet the definition of a "major modification" pursuant to 45CSR14 and, therefore, an air quality impact (computer modeling) analysis was not required. Additionally, based on the nature of the proposed modification, modeling was not required under 45CSR13, Section 7.

MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS

No substantive changes are being made in the monitoring, compliance demonstrations, record-keeping, and reporting requirements in the draft permit.

TESTING OF OPERATIONS

No additional testing requirements were added as a part of this modification.

CHANGES TO PERMIT R13-0898B

While only minor changes were made to the existing permitting language (addition of the second methylene chloride cryogenic recovery system), the requirements were placed in the new permitting boilerplate.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director the issuance of Permit Number R13-0898C to Alliant Techsystems Operations LLC for the above discussed changes to the Orbital ATK Allegany Ballistics Laboratory located near Short Gap, Mineral County, WV.

Joe Kessler, PE
Engineer

4-18-16
Date