State of Utah

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Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQE-IN132760008-22

March 14, 2022

Ryan Bird
US Synthetic
1260 South 1600 West
Orem, UT 84058
ryan.bird@championx.com

Dear Mr. Bird:

Re: Intent to Approve:
Minor Modification to DAQE-AN132760007-21, dated August 11, 2021, to Increase Use of Hydrofluoric Acid for Leaching Process
Project Number: N132760008

The attached document is the Intent to Approve (ITA) for the above-referenced project. The ITA is subject to public review. Any comments received shall be considered before an Approval Order (AO) is issued. The Division of Air Quality is authorized to charge a fee for reimbursement of the actual costs incurred in the issuance of an AO. An invoice will follow upon issuance of the final AO.

Future correspondence on this ITA should include the engineer's name, **Christine Bodell,** as well as the DAQE number as shown on the upper right-hand corner of this letter. Christine Bodell, can be reached at (385) 290-2690 or cbodell@utah.gov, if you have any questions.

Sincerely,

Alan D. Humpherys, Manager
New Source Review Section

BCB:AH:CB:jg

cc: Utah County Health Department

STATE OF UTAH

Department of Environmental Quality
Division of Air Quality

INTENT TO APPROVE
DAQE-IN132760008-22
Minor Modification to DAQE-AN132760007-21, dated August 11, 2021, to Increase Use of Hydrofluoric Acid for Leaching Process

Prepared By
Christine Bodell, Engineer
(385) 290-2690
cbodell@utah.gov

Issued to
US Synthetic- Synthetic Material Manufacturing

Issued On
March 14, 2022

New Source Review Section Manager
Alan D. Humpherys

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GENERAL INFORMATION

CONTACT/LOCATION INFORMATION

Owner Name
US Synthetic

Source Name
US Synthetic- Synthetic Material Manufacturing

Mailing Address
1260 South 1600 West
Orem, UT 84058

Physical Address
1260 South 1600 West
Orem, UT 84058

Source Contact
Name Ryan Bird
Phone (801) 319-8891
Email ryan.bird@championx.com

UTM Coordinates
437,490 m Easting
4,458,350 m Northing
Datum NAD83
UTM Zone 12

SIC code 3533 (Oil & Gas Field Machinery & Equipment)

SOURCE INFORMATION

General Description
US Synthetic creates man-made polycrystalline diamond cutters by using high pressure and high-temperature sintering processes. On-site baghouses vent internally and control emissions from sandblasting and grinding. Additionally, hydrofluoric acid is used to leach metals from the polycrystalline diamond surfaces.

NSR Classification
Minor Modification at Minor Source

Source Classification
Located in Southern Wasatch Front O3 NAA, Provo UT $PM_{2.5}$ NAA
Utah County
Airs Source Size: B

Applicable Federal Standards
NSPS (Part 60), A: General Provisions
NSPS (Part 60), IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
MACT (Part 63), A: General Provisions
MACT (Part 63), ZZZZ: National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Project Description
US Synthetic has requested a modification to increase the use of hydrofluoric acid for the leaching process on-site. The process increases HAP emissions. The acid is used to leach metal off the man-made polycrystalline diamond cutters and increase product performance.

SUMMARY OF EMISSIONS

The emissions listed below are an estimate of the total potential emissions from the source. Some rounding of emissions is possible.

Criteria Pollutant	Change (TPY)	Total (TPY)
CO_2 Equivalent	0	98.29
Carbon Monoxide	0	2.54
Nitrogen Oxides	0	5.11
Particulate Matter - PM_{10}	0	0.46
Particulate Matter - $PM_{2.5}$	0	0.46
Sulfur Dioxide	0	2.34
Volatile Organic Compounds	0	15.01

Hazardous Air Pollutant	Change (lbs/yr)	Total (lbs/yr)
Generic HAPs (CAS #GHAPS)	0	2
Hydrogen Fluoride (Hydrofluoric Acid) (CAS #7664393)	640	4800
	Change (TPY)	**Total (TPY)**
Total HAPs	0.32	2.40

PUBLIC NOTICE STATEMENT

The NOI for the above-referenced project has been evaluated and has been found to be consistent with the requirements of UAC R307. Air pollution producing sources and/or their air control facilities may not be constructed, installed, established, or modified prior to the issuance of an AO by the Director.

A 30-day public comment period will be held in accordance with UAC R307-401-7. A notification of the intent to approve will be published in The Daily Herald on March 17, 2022. During the public comment period the proposal and the evaluation of its impact on air quality will be available for the public to review and provide comment. If anyone so requests a public hearing within 15 days of publication, it will be held in accordance with UAC R307-401-7. The hearing will be held as close as practicable to the location of the source. Any comments received during the public comment period and the hearing will be evaluated. The proposed conditions of the AO may be changed as a result of the comments received.

SECTION I: GENERAL PROVISIONS

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO.

I.1	All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]
I.2	The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]
I.3	Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]
I.4	All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or Executive Secretary's representative upon request, and the records shall include the two-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of five (5) years. [R307-401-8]
I.5	At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]
I.6	The owner/operator shall comply with UAC R307-107. General Requirements: Breakdowns. [R307-107]
I.7	The owner/operator shall comply with UAC R307-150 Series. Emission Inventories. [R307-150]

SECTION II: PERMITTED EQUIPMENT

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO.

II.A THE APPROVED EQUIPMENT

II.A.1	**US Synthetic Material Manufacturing Plant** Diamond manufacturer
II.A.2	**Press Blasting and Leaching Process** Sintering and machining of diamond-tipped cutters Hydrofluoric acid leaching to clean diamond surface

II.A.3	**Two (2) Degreasing Units** Capacity: 15 gallons, each
II.A.4	**One (1) Emergency Generator Engine** Rating: 400 kW (536 hp) Fuel: Diesel Construction Date: 5/24/2011 NSPS applicable: Subpart IIII MACT applicable: Subpart ZZZZ
II.A.5	**One (1) Emergency Generator Engine** Rating: 250 kW (335 hp) Fuel: Diesel Construction Date: 12/20/2006 NSPS applicable: Subpart IIII MACT applicable: Subpart ZZZZ
II.A.6	**Four (4) Baghouses** Location: Building #3 Vent Internally
II.A.7	**Seven (7) Baghouses** Location: Building #2 Vent Internally
II.A.8	**Nine (9) Baghouses** Location: Building #1 Vent internally
II.A.9	**Heaters** Rating: Less than 5 MMBtu/hr Fuel: Natural Gas Location: Buildings #1, #2, #3 For Informational Purposes

SECTION II: SPECIAL PROVISIONS

The intent is to issue an air quality AO authorizing the project with the following recommended conditions and that failure to comply with any of the conditions may constitute a violation of the AO.

II.B REQUIREMENTS AND LIMITATIONS

II.B.1	**Source-Wide Requirements**
II.B.1.a	The owner/operator shall not allow visible emissions from the following emission points to exceed the following values: A. All-natural gas combustion exhausts - 10% opacity B. All other points - 20% opacity. [R307-401-8]

II.B.1.a.1	Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9. [R307-401-8]
II.B.1.b	The owner/operator shall use only natural gas as a fuel in all heaters/boilers. [R307-401-8]
II.B.2	**Hydrogen Fluoride Requirements**
II.B.2.a	The owner/operator shall not use more than 12,000 gallons of hydrofluoric acid (HF) per rolling 12-month period. [R307-401-8]
II.B.2.a.1	The owner/operator shall: A. Determine usage by examination of individual hydrofluoric acid (HF) supplier billing records B. Record usage of hydrofluoric acid (HF) on a daily basis C. Use the usage records to calculate a new rolling 12-month total by the 20th day of each month using data from the previous 12 months D. Keep the usage records for all periods the plant is in operation. [R307-401-8]
II.B.2.a.2	The owner/operator shall keep hydrofluoric acid (HF) containers and beakers capped at all times, except during transfer of HF to and from beakers. [R307-401-8]
II.B.2.b	The owner/operator shall not use a hydrofluoric acid blend that exceeds a hydrogen fluoride concentration of 30% by weight. [R307-401-8]
II.B.2.b.1	The owner/operator shall determine the hydrogen fluoride concentration by examination of the hydrofluoric acid product safety data sheet (SDS). [R307-401-8]
II.B.3	**VOC Requirements**
II.B.3.a	The owner/operator shall not emit more than the following from evaporative sources (painting, printing, coating, and/or cleaning) on site: 15.01 tons per rolling 12-month period of VOCs. [R307-401-8]
II.B.3.a.1	The owner/operator shall calculate a new 12-month total by the 20th day of each month using data from the previous 12 months. The owner/operator shall use a mass-balance method to calculate emissions from evaporative sources. The owner/operator may use the following equations with applicable units to comply with the mass-balance method: VOCs = [% VOCs by Weight/100] x [Density] x [Volume Consumed]. [R307-401-8]
II.B.3.a.2	The owner/operator shall use a mass-balance method to quantify any amount of VOCs reclaimed. The owner/operator shall subtract the amount of VOCs reclaimed from the quantities calculated above to provide the monthly total emissions of VOCs. [R307-401-8]

II.B.3.a.3	The owner/operator shall keep records each month of the following: A. The name (as per SDS) of the VOC-emitting material B. The maximum percent by weight of VOCs in each material used C. The density of each material used D. The volume of each VOC-emitting material used E. The amount of VOCs emitted from each material F. The amount of VOCs reclaimed and/or controlled from each material G. The total amount of VOCs emitted from all materials (in tons). [R307-401-8]
II.B.4	**Emergency Engine Requirements**
II.B.4.a	The owner/operator shall not operate each emergency engine on site for more than 100 hours per rolling 12-month period during non-emergency situations. There is no time limit on the use of the engines during emergencies. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
II.B.4.a.1	To determine compliance with a rolling 12-month total, the owner/operator shall calculate a new 12-month total by the 20th day of each month using data from the previous 12 months. Records documenting the operation of each emergency engine shall be kept in a log and shall include the following: A. The date the emergency engine was used B. The duration of operation in hours C. The reason for the emergency engine usage. [40 CFR 60 Subpart ZZZZ, R307-401-8]
II.B.4.a.2	To determine the duration of operation, the owner/operator shall install a non-resettable hour meter for each emergency engine. [R307-401-8, 40 CFR 63 Subpart ZZZZ]
II.B.4.b	The owner/operator shall only use diesel fuel (e.g. fuel oil #1, #2, or diesel fuel oil additives) as fuel in each emergency engine. [R307-401-8]
II.B.4.b.1	The owner/operator shall only combust diesel fuel that meets the definition of ultra-low sulfur diesel (ULSD), which has a sulfur content of 15 ppm or less. [R307-401-8]
II.B.4.b.2	To demonstrate compliance with the ULSD fuel requirement, the owner/operator shall maintain records of diesel fuel purchase invoices or obtain certification of sulfur content from the diesel fuel supplier. The diesel fuel purchase invoices shall indicate that the diesel fuel meets the ULSD requirements. [R307-401-8]

PERMIT HISTORY

This Approval Order shall supersede (if a modification) or will be based on the following documents:

Supersedes	DAQE-AN132760007-21 dated August 11, 2021
Is Derived From	NOI dated January 18, 2022
Incorporates	Additional Information dated January 25, 2022
Incorporates	Additional Information dated February 11, 2022

ACRONYMS

The following lists commonly used acronyms and associated translations as they apply to this document:

40 CFR	Title 40 of the Code of Federal Regulations
AO	Approval Order
BACT	Best Available Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDS	Classification Data System (used by Environmental Protection Agency to classify sources by size/type)
CEM	Continuous emissions monitor
CEMS	Continuous emissions monitoring system
CFR	Code of Federal Regulations
CMS	Continuous monitoring system
CO	Carbon monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent - Title 40 of the Code of Federal Regulations Part 98, Subpart A, Table A-1
COM	Continuous opacity monitor
DAQ/UDAQ	Division of Air Quality
DAQE	This is a document tracking code for internal Division of Air Quality use
EPA	Environmental Protection Agency
FDCP	Fugitive dust control plan
GHG	Greenhouse Gas(es) - Title 40 of the Code of Federal Regulations 52.21 (b)(49)(i)
GWP	Global Warming Potential - Title 40 of the Code of Federal Regulations Part 86.1818-12(a)
HAP or HAPs	Hazardous air pollutant(s)
ITA	Intent to Approve
LB/YR	Pounds per year
MACT	Maximum Achievable Control Technology
MMBTU	Million British Thermal Units
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NO_x	Oxides of nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
PM_{10}	Particulate matter less than 10 microns in size
$PM_{2.5}$	Particulate matter less than 2.5 microns in size
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
R307	Rules Series 307
R307-401	Rules Series 307 - Section 401
SO_2	Sulfur dioxide
Title IV	Title IV of the Clean Air Act
Title V	Title V of the Clean Air Act
TPY	Tons per year
UAC	Utah Administrative Code
VOC	Volatile organic compounds