Appendix A

Consultation and Correspondence

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Federal Agencies

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Preserving America's Heritage

June 24, 2019

Ms. Michelle A. Linn
Headquarters Air Force Space Command Civil Engineer
[redacted]

Ref: *Proposed Establishment of a Permanent US Space Command Headquarters within the State of Colorado*
ACHPConnect Log Number: [redacted]

Dear Ms. Linn:

On June 5, 2019, the Advisory Council on Historic Preservation (ACHP) received your notification and supporting documentation regarding the initiation of Section 106 consultation regarding the referenced undertaking. Based upon the information you provided, we have concluded that our participation at this time, pursuant to Section 800.2(b)(1), of our regulations, "Protection of Historic Properties" (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act, may be premature.

Air Force Space Command should continue consultation with the Colorado State Historic Preservation Officer, Indian tribes and other consulting parties, as appropriate, to identify and evaluate historic properties and to assess any potential adverse effects on those historic properties. If you determine, through consultation, that the undertaking will adversely affect historic properties and that a Section 106 agreement document (Agreement) is necessary, Air Force Space Command must notify the ACHP of the finding of adverse effect and provide the documentation detailed at 36 CFR § 800.11(e). In the event that this undertaking is covered under the terms of an existing Agreement, you should follow the process set forth in the applicable Agreement.

If you have any questions or require our further assistance at this time, please contact Ms. Katharine R. Kerr at [redacted] or by e-mail at [redacted] and reference the ACHPConnect Log Number above.

Sincerely,

Artisha Thompson

Artisha Thompson
Historic Preservation Technician
Office of Federal Agency Programs

From: Gissentanna, Larry [redacted]
Sent: Tuesday, August 27, 2019 12:38 PM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Cc: Militscher, Chris [redacted]; Buskey, Traci P. [redacted]
Subject: [Non-DoD Source] RE: Draft Environmental Assessment and (FONSI) for United States Space Command Headquarters Basing and Construction

Mr. Russell Perry
HQ AFSPC/A4C
[redacted]

Dear Mr Perry:

The U. S. Environmental Protection Agency (EPA) has reviewed the referenced documents in accordance with Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act. The EPA understands that Pursuant to Section 1601(c) of the National Defense Authorization Act for fiscal year 2018, the U.S. Deputy Secretary of Defense was directed to review national security space Department of Defense (DoD) components and recommend changes to Congress by August 1, 2018. The U.S. Deputy Secretary of Defense's final report to Congress recommended that the President of the United States modify the Unified Command Plan to standup a new combatant command for space ('USSPACECOM'). The U.S. Strategic Command's Joint Force Space Component Command was elevated to a combatant command and assumed these duties in 2019. The EPA further understands that the Proposed Action is to establish a permanent operational USSPACECOM headquarters as a functional combatant command.

Upon review of the DEA and FONSI, the EPA concludes that appropriate alternatives were considered and analyzed. It also appears that with mitigation and best management practices (BMPs), this project will not have a significant impact on human health and the environment on any of the sites selected as interim and permanent sites. The Proposed Action as planned would have positive short-term socioeconomic impacts in jurisdictions adjacent to or near the selected installation(s), such as employment, sales, and tax revenues generated by construction activities.

Thank you for the opportunity to provide comments on your proposed project. Please provide this office with a hard copy and electronic version of the final NEPA documents. Please remember to keep the local community informed and involved throughout the project process through community meetings and through local and social media outlets. If you have any questions, feel free to contact me via the information provided below.

Thanks again.

Sincerely,

Larry O. Gissentanna
Project Manager, DoD & Federal Facilities

U.S. Environmental Protection Agency/ Region 4
Strategic Programs Office, NEPA Section
[redacted]
Office: [redacted]

Preserving America's Heritage

September 3, 2019

Michelle A. Linn
Chief, Civil Engineer Division
Space Command
Department of the Air Force
[redacted]

Ref: *Proposed Establishment of a Permanent US Space Command (USSPACECOM) Headquarters Colorado*
ACHPConnect Log Number: [redacted]

Dear Ms. Linn:

On August 19, 2019, the Advisory Council on Historic Preservation (ACHP) received a copy of the executed Section 106 agreement document (Agreement) for the referenced undertaking. In accordance with 36 CFR 800.6(b)(1)(iv) of the ACHP's regulations, the ACHP acknowledges receipt of the Agreement. The filing of the Agreement and implementation of its terms fulfills the requirements of Section 106 of the National Historic Preservation Act and the ACHP's regulations.

We appreciate receiving a copy of this Agreement for our records. Please ensure that all consulting parties are provided a copy of the executed Agreement in accordance with 36 CFR 800.6(c)(9). If you have any questions or require additional assistance, please contact Kathrine Kerr at [redacted] or by e-mail at [redacted] and reference the ACHPConnect Log Number above.

Sincerely,

Artisha Thompson
Historic Preservation Technician
Office of Federal Agency Programs

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Native American Tribes

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SOUTHERN UTE INDIAN TRIBE

Southern Ute Cultural & Preservation Department
[redacted]

July 11, 2019

Pamela Miller
[redacted]

Dear Ms. Miller,

I have reviewed your Consultation Request under section 106 of the National Historic Preservation Act regarding the Project Specific PA USSPACECOM project and offer the following response as indicated by the box that is checked.

☐ NO EFFECT: I have determined that there are no properties of religious and cultural significance to the Southern Ute Indian Tribe that are listed on the National Register within the area of potential effect or that the proposed project will have no effect on any such properties that may be present.

☐ NO ADVERSE EFFECT: I have identified properties of cultural and religious significance within the area of effect that I believe are eligible for listing in the National Register, for which there would be no adverse effect as a result of the proposed project.

☐ ADVERSE EFFECT: I have identified properties of cultural and religious significance within the area of potential effect (APE) that are eligible for listing in the National Register. I believe the proposed project would cause an adverse effect on these properties.

☒ REQUEST FOR ADDITIONAL INFORMATION: The Southern Ute Indian Tribe requests additional information on the planned site for its impact on properties of religious and cultural importance to the Tribe as follows: We request consultation under section 106 of NHPA to be involved in the development of PA. Please provide us a timeline for this project.

Please reply to Cassandra Atencio at [redacted] and Garrett Briggs at [redacted] and refer to in future ongoing correspondence with this office.

Sincerely,

Ms. Cassandra Atencio
NAGPRA Coordinator
Southern Ute Cultural Department
Southern Ute Indian Tribe

GWYꮕ DBP
CHEROKEE NATION®
P.O. Box 948 • Tahlequah, OK 74465-0948 • 918-453-5000 • cherokee.org

Office of the Chief

Bill John Baker
Principal Chief
[redacted]

S. Joe Crittenden
Deputy Principal Chief
[redacted]

July 16, 2019

Benjamin J. Hoksbergen
Cultural Resource Manager, Archaeologist
IMRE-PWE-N
[redacted]

Re: Proposed Space Command Headquarters at Redstone Arsenal

Mr. Benjamin J. Hoksbergen:

The Cherokee Nation (Nation) is in receipt of your correspondence about **Proposed Space Command Headquarters at Redstone Arsenal** for Sites 2 and 5, and appreciates the opportunity to provide comment upon this project. Please allow this letter to serve as the Nation's interest in acting as a consulting party to this proposed project.

The Nation maintains databases and records of cultural, historic, and pre-historic resources in this area. Our Historic Preservation Office reviewed this project, cross referenced the project's legal description against our information, and found no instances where this project intersects or adjoins such resources. Thus, the Nation does not foresee this project imparting impacts to Cherokee cultural resources at this time.

However, the Nation requests that Redstone Arsenal halt all project activities immediately and re-contact our Offices for further consultation if items of cultural significance are discovered during the course of this project.

Additionally, the Nation requests that Redstone Arsenal conduct appropriate inquiries with other pertinent Tribal and Historic Preservation Offices regarding historic and prehistoric resources not included in the Nation's databases or records.

If you require additional information or have any questions, please contact me at your convenience. Thank you for your time and attention to this matter.

Wado,

Elizabeth Toombs

Elizabeth Toombs, Tribal Historic Preservation Officer
Cherokee Nation Tribal Historic Preservation Office
[redacted]

From: Freddie Romero [redacted]
Sent: Thursday, July 25, 2019 10:40 AM
To: Carver, Craig
Subject: Re: Announcing 30-day Public Comment Period: United States Space Command (USSPACECOM) Draft Environmental Assessment / Draft FONSI

Categories: Red Category

Mr. Carver,

The SYBCI Elders Council will be requesting that you meet with us in regards to this project. As you may or may not be aware, VAFB contains very sensitive areas. If needed, we would like to engage in consultation.

Also, if this project is expending any Federal monies, Sec 106consultation is required under the NHPA, 36 CFR 800.

So if would contact me at your earliest convenience, it would be most appreciated, thank you.

Freddie Romero
Cultural Resources Coordinator
SYBCI Elders Council
[redacted]

From: Carver, Craig [redacted]
Sent: Wednesday, July 24, 2019 4:14:51 AM
To: Carver, Craig [redacted]
Subject: Announcing 30-day Public Comment Period: United States Space Command (USSPACECOM) Draft Environmental Assessment / Draft FONSI

The U.S. Air Force announces the availability of the United States Space Command (USSPACECOM) Basing and Construction Draft Environmental Assessment (EA) / Draft Finding of No Significant Impact (FONSI) for a 30-day public review and comment period beginning 24 July 2019 and ending 23 August 2019. Additional information is provided in the attachment to this email.

The Draft EA / Draft FONSI is available for review and download at www.afspc.af.mil

Requests for a copy of the Draft EA / Draft FONSI on compact disc should be directed to:

Russell Perry
HQ AFSPC/A4C
[redacted]

Written comments and inquiries regarding the Draft EA / Draft FONSI should be sent to the postal mail or email address above.

NOTE: Comments submitted by email must be provided in the body of the email and not as a separate attachment or link. Emails containing attachments or links will be discarded and not considered.

Please do not reply to this message.

From: Section106 [redacted]
Sent: Monday, August 12, 2019 3:31 PM
To: Carver, Craig
Subject: RE: Announcing 30-day Public Comment Period: United States Space Command (USSPACECOM) Draft Environmental Assessment / Draft FONSI

Good afternoon Mr. Carver,

Thank you for sending the correspondence for the proposed United States Space Command Headquarters Basing and Construction for seven potential interim site alternatives and seven permanent site alternatives located at five Department of Defense Installations across the United States. There is only one that is located within the Muscogee (Creek) Nation's historic area of interest and that is the Red Stone Arsenal Army Garrison located in Madison County, Alabama. After review, there are many archaeological sites located within around the Redstone Arsenal Army Garrison, so if this installation was to be selected, the Muscogee Nation would request for a registered professional archaeologist to monitor all of the ground disturbing activities in case there was to be an inadvertent discovery of human remains or funerary objects. The Muscogee Nation would also request a confirmation if Red Stone Arsenal Garrison was selected.

Thank you,

Robin Soweka Jr.
Historic and Cultural Preservation Department | Cultural Resource Specialist
Muscogee (Creek) Nation
[redacted]
http://www.muscogeenation-nsn.gov/

From: Carver, Craig [redacted]
Sent: Wednesday, July 24, 2019 6:15 AM
To: Carver, Craig [redacted]
Subject: Announcing 30-day Public Comment Period: United States Space Command (USSPACECOM) Draft Environmental Assessment / Draft FONSI

The U.S. Air Force announces the availability of the United States Space Command (USSPACECOM) Basing and Construction Draft Environmental Assessment (EA) / Draft Finding of No Significant Impact (FONSI) for a 30-day public review and comment period beginning 24 July 2019 and ending 23 August 2019. Additional information is provided in the attachment to this email.

The Draft EA / Draft FONSI is available for review and download at www.afspc.af.mil

Requests for a copy of the Draft EA / Draft FONSI on compact disc should be directed to:

Russell Perry

HQ AFSPC/A4C
[redacted]

Written comments and inquiries regarding the Draft EA / Draft FONSI should be sent to the postal mail or email address above.

NOTE: Comments submitted by email must be provided in the body of the email and not as a separate attachment or link. Emails containing attachments or links will be discarded and not considered.

Please do not reply to this message.

(TRIBAL HISTORIC PRESERVATION)
[redacted]

[redacted] Toll Free
[redacted] Telephone

August 15, 2019
THPO ID #[redacted]

Department of the Air Force
Mr. Russell Perry
[redacted]

RE: USSPACECOM

On behalf of the Tribal Historic Preservation Office of the Cheyenne and Arapaho Tribes, thank you for the notice of the referenced project. I have reviewed your Consultation request under Section 106 of the National Historic Preservation Act regarding the project proposal and have commented as follows.

At this time, it is determined to be categorized as **No Adverse Effect;** However, if at any time during the project implementation should any change orders occur which would affect the current APE, or if inadvertent discoveries are made that reflect **additional** evidence of traditional cultural properties (TCP) such as: ceremonial or celebration objects, stone rings, villages, burial mounds, battlefield artifacts, or human remains please cease work immediately, in area of discovery and notify the Cheyenne Arapaho THPO Office within 72 hours.

Also, if inadvertent discoveries are made; pursuant to Title 36 Code of Federal Regulation Part 800.13, as amended; you will also be required to make arrangements for a professional archaeologist to visit the site of discovery and assess the potential significance of any artifacts or features that were unearth. If human remains are discovered State and Tribal NAGPRA representatives will be contacted and protocols will be executed.

Please contact me with the THPO ID number at [redacted] or [redacted] if you have any questions or concerns. Thank you again for your notification!

Best Regards,

Christopher Rednose
Technical Assistant
Tribal Historic Preservation

CC: Max Bear, THPO

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CHEROKEE NATION®

Office of the Chief

Bill John Baker
Principal Chief
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S. Joe Crittenden
Deputy Principal Chief
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August 23, 2019

Chief Michelle A. Linn, GS-15, DAFC
Department of the Air Force
HQ AFSPC/A4C
[redacted]

Re: Proposed Basing and Construction of the United States Space Command

Dear Chief Michelle A. Linn:

The Cherokee Nation (Nation) is in receipt of your correspondence about and related reports for the **Proposed Basing and Construction of the United States Space Command**, and appreciates the opportunity to provide comment upon this project. Please allow this letter to serve as the Nation's interest in acting as a consulting party to this project proposed for the U.S. Army Garrison Redstone Arsenal in Alabama.

The Nation maintains databases and records of cultural, historic, and pre-historic resources in this area. Our Historic Preservation Office reviewed this project, cross referenced the project's legal description against our information, and found instances where this project is within close proximity to such resources, including the CHEROKEE TRAIL OF TEARS, Benge, Deas, Drew, and Whitely Attachments. This significant cultural and historic resource, however, is located outside the Area of Potential Effect. Thus, the Nation does not object to the project proceeding as long as the following recommendations are observed:

1) The Nation requests that Department of the Air Force re-contact this Office for additional consultation if there are any changes to the scope of or activities within the Area of Potential Effect;

2) The Nation requests that the Department of the Air Force halt all project activities immediately and re-contact our Offices for further consultation if items of cultural significance are discovered during the course of this project; and

3) The Nation requests that the Department of the Air Force conduct appropriate inquiries with other pertinent Tribal and Historic Preservation Offices regarding historic and prehistoric resources not included in the Nation's databases or records.

If you require additional information or have any questions, please contact me at your convenience. Thank you for your time and attention to this matter.

Wado,

Elizabeth Toombs

Elizabeth Toombs, Tribal Historic Preservation Officer
Cherokee Nation Tribal Historic Preservation Office
[redacted]

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State and Local Agencies

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PLANNING & COMMUNITY DEVELOPMENT DEPARTMENT
Land Use Review Division

COLORADO SPRINGS
OLYMPIC CITY USA

June 28, 2019

Department of the Air Force
Headquarters for Air Force Space Command
Environmental Program Manager
Attn. Mr. Russell Perry
[redacted]

RE: **Section 106 Comment Response – Establishment of a Permanent United States Space Command, Peterson AFB**

FILE No.: [redacted]

Dear Mr. Perry, and Ms. Miller,

The City's Land Use Review Division of the Planning & Community Development Department, in its administration of the Certified Local Government obligations for the City, has reviewed the above-mentioned Section 106 solicitation, dated June 3, 2019, for comments concerning the proposed establishment of a permanent United States Space Command at Peterson AFB, CO. According to the submitted materials, the undertaking is not anticipated to result in any direct or visual impacts on known historic properties or resources. Since accurate potential effects are not known or cannot be detailed at this time, the City respectfully requests to be considered a consulting and interested party for the undertaking, and asks that it be party to any programmatic agreement for the undertaking.

Should further information become available or resources identified through coordination with other parties or the commencement of construction activities associated with the proposed undertaking, the City of Colorado Springs requests to be notified to ensure further action is not warranted according to applicable local, state and federal regulations.

The City of Colorado Springs is committed to excellent customer service. We would like to hear your comments about the service you received during the review of this application and your interaction with our department. Please consider completing the survey through Speak UP COS located at [redacted].Your response is completely confidential.

If you have any questions regarding the above sections, please contact me at [redacted] or by phone at [redacted]

Sincerely,

Daniel Sexton, ACIP
Senior Planner

C: City Planning File: [redacted]
Chris Staley – letter via e-mail
Mr. Russell Perry, [redacted]
Ms. Pamela Miller, [redacted]

From: Breese, Lucille [redacted]
Sent: Wednesday, July 24, 2019 7:15 AM
To: Carver, Craig
Subject: Automatic reply: Announcing 30-day Public Comment Period: United States Space Command (USSPACECOM) Draft Environmental Assessment / Draft FONSI

I am no longer employed with the City of Lompoc, please contact Brian Halvorson (email: [redacted] or phone: [redacted] or Cherridah Weigel (email: [redacted] or phone: [redacted]).

Thank you.

From: Halvorson, Brian [redacted]
Sent: Wednesday, July 24, 2019 11:27 AM
To: Carver, Craig [redacted]
Subject: RE: Announcing 30-day Public Comment Period: United States Space Command (USSPACECOM) Draft Environmental Assessment / Draft FONSI

Thank you Craig.

Just curious, when will it be announced which location (hopefully it will be VAFB!) has been selected for the new headquarters location?

Brian Halvorson
Planning Manager
City of Lompoc
[redacted]

From: Carver, Craig [redacted]
Sent: Wednesday, July 24, 2019 4:19 AM
To: Carver, Craig [redacted]
Subject: Announcing 30-day Public Comment Period: United States Space Command (USSPACECOM) Draft Environmental Assessment / Draft FONSI

The U.S. Air Force announces the availability of the United States Space Command (USSPACECOM) Basing and Construction Draft Environmental Assessment (EA) / Draft Finding of No Significant Impact (FONSI) for a 30-day public review and comment period beginning 24 July 2019 and ending 23 August 2019. Additional information is provided in the attachment to this email.

The Draft EA / Draft FONSI is available for review and download at www.afspc.af.mil

Requests for a copy of the Draft EA / Draft FONSI on compact disc should be directed to:

> Russell Perry
> HQ AFSPC/A4C
> 150 Vandenberg St. Suite 1105
> Peterson AFB, CO 80914-4230
> [redacted]

Written comments and inquiries regarding the Draft EA / Draft FONSI should be sent to the postal mail or email address above.

NOTE: Comments submitted by email must be provided in the body of the email and not as a separate attachment or link. Emails containing attachments or links will be discarded and not considered.

Please do not reply to this message.

From: Sipes, Eric [redacted]
Sent: Wednesday, July 24, 2019 7:18 AM
To: Carver, Craig
Subject: Automatic reply: Announcing 30-day Public Comment Period: United States Space Command (USSPACECOM) Draft Environmental Assessment / Draft FONSI

I will be out of the office until Wednesday, July 24th, but will be checking email as possible. If you need immediate assistance, please contact: [redacted]

ALABAMA HISTORICAL COMMISSION

468 South Perry Street
P.O. Box 300900
Montgomery, Alabama 36130-0900
334-242-3184 / Fax: 334-240-3477

Lisa D. Jones
Executive Director
State Historic Preservation Officer

August 2, 2019

Michelle A. Linn, GS-15, DAFC
Chief, Civil Engineer Division
Command Civil Engineer
Headquarters Air Force Space Command
[redacted]

Re: AHC 2019-1153
Notice of FONSI
Proposed Basing and Construction of the US Space Command Headquarters
Madison County

Dear Mr. Linn:

Thank for the notice of the Finding of No Significant Impact for the above referenced project. We look forward to initiation of consultation for this undertaking under Section 106 of the National Historic Preservation Act.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Amanda McBride at [redacted] or [redacted]. Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Lee Anne Wofford

Lee Anne Wofford
Deputy State Historic Preservation Officer

LAW/AMH/amh

From: Theresa Odello [redacted]
Sent: Thursday, August 8, 2019 3:02 PM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] Headquarters of USSPACECOM

Mr. Perry,

Thank you for the opportunity to comment on the USSPACECOM environmental assessment. I support the assessment that the vacant land at Peterson and Schriever AFBs is ideal for a new headquarters building. Furthermore, the Colorado Springs Chamber & EDC is already working to identify potential leased office space for the temporary headquarters facility.

Lastly, the socioeconomic climate in Colorado Springs is very supportive of both welcoming the new workforce, as well as providing an educated talent pool which is familiar with DoD and space disciplines.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

Best regards,

Theresa Odello, CPRP
Recreation Coordinator
El Paso County, Recreation & Cultural Services
[redacted] office
Office Hours Tuesday through Saturday

From: Zarrin - GovOffice, Adam [redacted]
Sent: Wednesday, August 21, 2019 10:47 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Cc: LOH, MICHAEL A Maj Gen NG ANG JFHQ CO/JFHQ-CO[redacted]
Subject: [Non-DoD Source] Governor Polis, Public Comment on Environmental Assessment, U.S. Space Command HQ

Transmitted on behalf of Colorado Governor Jared Polis

August 20, 2019

Gen. John W. Raymond
c/o Mr. Russell Perry
HQ AFSPC/A4C
[redacted]

General Raymond,

On behalf of the entire state of Colorado, we appreciate the opportunity to comment on the draft environmental assessment for United States Space Command. As the epicenter of national security space, Colorado is the prime location to house national efforts to ensure continued U.S. technological superiority, global leadership, and capabilities in space. Both as a member of Congress, and now as Governor, I applaud the Department of Defense's commitment to the National Environmental Policy Act (NEPA) process and ensuring that the needs of the environment are duly considered. And for these reasons, it is in the nation's best interests to base U.S. Space Command in Colorado.

Colorado has long been a champion of both our military service members and preserving and protecting our environment. We have been proactive in finding mutually beneficial arrangements that protect both the environment and the integrity of training and operations which are essential to national security. As such, I concur with the finding of no significant impact as it relates to Colorado's military installations.

Several aerospace military capabilities are already stationed in Colorado. For example, we are home to Air Force Space Command, 50th Space Wing at Schriever Air Force Base (AFB), 460th Space Wing at Buckley AFB, 21st Space Wing at Peterson AFB, U.S. Northern Command, and North American Aerospace Defense Command (NORAD). In addition, Colorado is home to the Department of Defense and Intelligence Community integration efforts at the National Space Defense Center and the United States Air Force Academy. Furthermore, the Colorado National Guard represents 85 percent and 45 percent of all Army and Air Guard units in the U.S., respectively. Finally, we have the infrastructure and communications platforms necessary to support additional sensitive national security space responsibilities.

Colorado is home to a diverse workforce with the right skills and educational background to support and develop cutting-edge solutions to the complex challenges faced in the national defense and intelligence space missions. Colorado ranks first in the U.S. in its concentration of aerospace jobs. We also have the largest aerospace economy on a per capita basis. Finally, we value the families that are essential to the service members' ability to excel and enjoy an unparalleled quality of life, be it for employment, education or recreation.

Please engage with Maj. Gen. Mike Loh, the Adjutant General of Colorado, if you require any assistance in this important undertaking. Thank you in advance for your consideration, and we invite you to visit Colorado to witness the unmatched potential we have to offer the national security, defense, and aerospace industries.

Respectfully,

Jared Polis
Governor

air pollution control district
SANTA BARBARA COUNTY

August 23, 2019

Russell Perry
HQ AFSPC/A4C
[redacted]

Re: Santa Barbara County Air Pollution Control District Comments on Draft Finding of No Significant Impact Environmental Assessment for United States Space Command Headquarters Basing and Construction

Dear Mr. Perry:

The Santa Barbara County Air Pollution Control District (District) is a state-designated special district with regulatory authority over stationary sources of air pollution in the county. Under Title V of the Federal Clean Air Act, the District issues federal operating permits to the largest sources of air pollution in the County; Vandenberg Air Force Base is one such source. More information on the District's Title V Operating Permit program is available under Title V of the federal Clean Air Act is available at www.ourair.org/title-v-permits. In addition, the District reviews environmental documents prepared by other lead agencies to ensure that air quality impacts from mobile, stationary, and area sources are addressed and that any adverse impacts are adequately mitigated. The District has reviewed the Draft Environmental Assessment (EA) for the referenced project.

Summary of Project Description and the Vandenberg Air Force Base Alternative:

The U.S. Air Force proposes to establish a U.S. Space Command (USSPACECOM) headquarters. The Proposed Action would accommodate approximately 1,870 personnel in an administrative headquarters facility setting. This requirement includes 498,000 square feet of office/administrative space and 502,000 square feet for privately owned vehicle (POV) parking, totaling 1,000,000 square feet, or approximately 23 acres. Temporary basing to conduct operations prior to the completion of the permanent facility (estimated to be 2025) would provide 595,000 square feet of interim facility space and POV parking. Existing, vacant facilities and/or temporary/modular facilities would be used at the selected installation in the interim until the permanent headquarters facility is operational. The Proposed Action would be implemented at one of five Department of Defense (DoD) installations: Buckley Air Force Base (AFB), Peterson AFB, and Schriever AFB in Colorado; Vandenberg AFB in California; and U.S. Army Garrison Redstone Arsenal (Redstone Arsenal) in Alabama.

One interim and one permanent site alternative at Vandenberg AFB met all established selection standards for the Proposed Action, and are retained for further evaluation in this EA. Interim Site Alternative 1 consists of minor interior renovations and use of existing Buildings 6523, 7225, and 10577. The permanent site alternative at Vandenberg AFB covers approximately 22.3 acres in the installation's intensively developed cantonment area. The site is bounded by California Boulevard to the northwest, 10th Street to the northeast, Arizona Avenue to the southeast, and 12th Street to the southwest. The site is divided into four similarly sized quadrants by 11th Street, which extends northwest to southeast, and an unnamed street that extends northeast to southwest between 10th and 12th streets. The site is previously disturbed, and was part of Camp Cook during World War II. Existing uses on the site's northern, eastern, and southern quadrants consist of paved parking lots that are bordered by areas of maintained lawn and ornamental trees and shrubs. The site's eastern quadrant is occupied by a modular office building, storage facility, and paved parking/lay-down area.

General Comments:

District staff has the following general comments on the Draft EA and the proposed project:

The proposed project may include equipment subject to District permitting requirements and prohibitory rules, such as emergency/standby generator engines and boilers. If such equipment is proposed and subject to District permit, the District will become a lead agency under the California Environmental Quality Act (CEQA), and the District's permit action will require CEQA review prior to issuance. When evaluating projects pursuant to CEQA, District staff compares project air pollutant emissions to District board-adopted CEQA significance thresholds (see *Environmental Review Guidelines for the Santa Barbra County APCD*, revised April 2015, www.ourair.org/landuse). We note that the analyses and findings in the Draft EA do not reference the District's CEQA significance thresholds. The District's CEQA significance thresholds are much lower than the General Conformity significance thresholds of 100 tons per year. Additional CEQA analysis and documentation will be required, and such analysis must compare project emissions to the District's CEQA significance thresholds, and must also include an analysis of project impacts on global climate change. Analysis of climate change impacts should include quantification of the proposed project's greenhouse gas (GHG) emissions, disclosure of impacts in the document, and mitigation of impacts as feasible.

If combustion equipment such as emergency/standby generator engines and/or boilers are proposed as part of the project, please include a description of such equipment in the EA. The description should include the equipment's rating (e.g. brake horsepower, BTU, etc.), fuel type, and operational hours.

Specific Comments:

District staff has the following specific comments on the Draft EA:

1. **Section 4.5 Air Quality, Page 4.5-1:** This document compares project emissions against General Conformity significance thresholds (i.e., de minimis thresholds) established by the federal Clean Air Act. The significance threshold of 100 tons per year does not correspond to the District's board-adopted significance thresholds for operational emissions, which are as follows:

    - emit (from all project sources, both stationary and mobile) less than the daily trigger for offsets or Air Quality Impact Analysis set in the APCD New Source Review Rule, for any pollutant (i.e., 240 pounds/day for ROC or NOx; and 80 lbs/day for PM10); and
    - emit less than 25 pounds per day of NOx or ROC from motor vehicle trips only; and
    - not cause or contribute to a violation of any California or National Ambient Air Quality Standard (except ozone); and

- not exceed the APCD health risk public notification thresholds adopted by the APCD Board (10 excess cancer cases in a million for cancer risk and a Hazard Index of more than one (1.0) for non-cancer risk ; and
- be consistent with the latest adopted federal and state air quality plans for Santa Barbara County.

Therefore, if the project is required to be evaluated under CEQA with the District acting as lead agency, different thresholds would be applied to the project to determine the significance of air quality impacts. The District also recommends the application of our thresholds to other CEQA lead agencies in the absence of locally-adopted thresholds.

2. **Section 4.5 Air Quality, Section 4.5.1 Criteria Pollutants Impacts, Page 4.5-1:** Proposed Action emissions from the construction and operations of the new USSPACECOM building are calculated using the Air Conformity Applicability Model, Version 5.0.1.4a (ACAM). When quantifying air quality impacts from land use projects located in California, the District recommends the use of the California Emissions Estimator Model (CalEEMod). This model can be used for a variety of situations where an air quality analysis is necessary or desirable, such as preparing California Environmental Quality Act (CEQA) or National Environmental Policy Act (NEPA) documents. If the proposed project were modeled using CalEEMod, the project's emissions may differ from the estimates in the EA and may exceed local CEQA thresholds. For example, the District utilized CalEEMod to estimate project emissions using project information consistent with what was provided in the EA. The results are included as Attachment C to this letter and indicate that project emissions are above the District's adopted thresholds for mobile sources.

3. **Section 4.5 Air Quality, Section 4.5.1.4 Vandenberg AFB, Page 4.5-10:** This section states that, *"As stated in Section 3.5.3.4, Vandenberg AFB is in federal and state attainment for all criteria pollutants. Therefore, a general conformity analysis is not required."* This statement is incorrect in regards to our air district's attainment status for state air quality standards. Vandenberg AFB is <u>not</u> in state attainment for all criteria pollutants; Santa Barbara County is classified as nonattainment-transitional for the state ozone standard and nonattainment for the state PM_{10} standard. Please correct the referenced statement.

4. **Section 4.5 Air Quality, Section 4.5.1.4 Vandenberg AFB, Page 4.5-10:** This section states that, *"The California Environmental Quality Act establishes daily significance thresholds for all pollutants by expanding the annual General Conformity thresholds. For only Vandenberg AFB, the worst-case daily net-change emissions are compared to the daily significance thresholds in Table 4.5-8. Like the annual significance indicators thresholds, all attainment criteria pollutants were below the daily significance thresholds. Therefore, the potential air quality impact from all criteria pollutants is not significant."*

   It is unclear what is meant by, or the basis for, the statement that CEQA *"establishes daily significance thresholds for all pollutants by expanding the annual General Conformity thresholds."* CEQA does not prescribe thresholds of significance for criteria pollutants. Lead agencies have the discretion to utilize thresholds of their choosing, provided such thresholds are supported by substantial evidence, as outlined in CEQA Guidelines Section 15064.7. As mentioned in previous comments, the District has adopted significance thresholds for operational emissions that are used when the District acts as a lead agency under CEQA. The District also recommends the application of our thresholds to other CEQA lead agencies in the absence of locally-adopted thresholds.

It appears that the "daily significance threshold" utilized in Table 4.5-8 is simply the annual de minimis threshold divided by 365. This threshold does not correspond with the District's daily mass emission significance threshold for any criteria pollutant, or any other locally-adopted CEQA threshold that we are aware of.

5. **Section 4.5 Air Quality, Section 4.5.4 Climate Change and Greenhouse Gas Emissions, Page 4.5-11-12:** This document uses the Environmental Impact Analysis Process (EIAP) Guide when evaluating the significance of climate change/GHG emissions impacts. Page 4.5-12 states that, "*All alternatives, except the No Action Alternative, would contribute to climate change, because each alternative is expected to generate GHG emissions. However, given the magnitude of the GHG emissions, the impact to cumulative global climate change is low*." The California State CEQA Guidelines Section 15064.4 states the following guidance when determining the significance of impacts from greenhouse gas emissions, "*In determining the significance of a project's greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions. The agency's analysis should consider a timeframe that is appropriate for the project. The agency's analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes*." Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHG emissions. As the guidelines point out, even a small project or increase in emissions can be cumulatively considerable and therefore significant.

<u>Suggested Measures Applicable to the Proposed Project:</u>

District staff suggests adopting the following measures to minimize air quality impacts and ensure compliance with state and local air quality regulations:

1. Standard dust mitigations (**Attachment A**) are recommended for all construction and/or grading activities. The name and telephone number of an on-site contact person must be provided to the District prior to start of construction.

2. District Rule 345, *Control of Fugitive Dust from Construction and Demolition Activities* establishes limits on the generation of visible fugitive dust emissions at demolition and construction sites. The rule includes measures for minimizing fugitive dust from on-site activities and from trucks moving on- and off-site. The rule can be viewed at www.ourair.org/wp-content/uploads/rule345.pdf.

3. The State of California considers particulate matter emitted by diesel engines carcinogenic. Therefore, during project grading, construction, and hauling, construction contracts must specify that contractors shall adhere to the requirements listed in **Attachment B** to reduce emissions of

particulate matter (as well as of ozone precursors) from diesel equipment. Recommended measures should be implemented to the maximum extent feasible.

4. Prior to start of construction, **District Authority to Construct permits** must be obtained for all equipment that requires a District permit. District Authority to Construct permits are required for diesel engines rated at 50 bhp and greater (e.g., firewater pumps and emergency standby generators). District permits are also required for natural gas or propane fired boilers/large water heaters with an individual unit rating over 2.0 million BTUs per hour or multiple units when the combined system design heat input rating exceeds 2.0 million BTUs per hour. Permits are required for any size units if not fired on natural gas or propane.

   Advisories: (1) In the case of a diesel-fired emergency generator, an equipment-specific Health Risk Assessment may be required as part of District permit issuance. The applicant should refer to the District's website at www.ourair.org/dice-atcm for more information on diesel engine permitting. (2) The District permit process can take several months. To avoid delay, the applicant is encouraged to submit their Authority to Construct permit application to the District as soon as possible, see www.ourair.org/permit-applications to download the necessary permit application(s).

5. All portable diesel-fired construction engines rated at 50 bhp or greater must have either statewide Portable Equipment Registration Program (PERP) certificates or District permits prior to grading/building permit issuance. Construction engines with PERP certificates are exempt from District permit, provided they will be on-site for less than 12 months.

6. Spark ignition piston-type internal combustion engines (e.g., gasoline or propane-fired) used exclusively for emergency electrical power generation or emergency pumping of water for flood control or firefighting are exempt from permit requirements pursuant to District Rule 202, Section F.1.d., provided the engine operates no more than 200 hours per calendar year and a record is maintained and is available to the District upon request. The record shall list the identification number of the equipment, the number of operating hours on each day the engine is operated and the cumulative total hours.

7. The applicant is required to complete and submit an **Asbestos Demolition/Renovation Notification or an EXEMPTION** from Notification for Renovation and Demolition (APCD Form ENF-28 or APCD Form ENF-28e), which can be downloaded at www.ourair.org/compliance-forms for each regulated structure to be demolished or renovated. Demolition notifications are required regardless of whether asbestos is present or not. The completed exemption or notification should be presented, mailed, or emailed to the Santa Barbara County Air Pollution Control District with a minimum of 10 working days advance notice prior to disturbing asbestos in a renovation or starting work on a demolition. The applicant should visit www.ourair.org/asbestos to determine whether the project triggers asbestos notification requirements or whether the project qualifies for an exemption.

8. Natural gas-fired fan-type central furnaces with a rated heat input capacity of less than 175,000 Btu/hr and water heaters rated below 75,000 Btu/hr must comply with the emission limits and certification requirements of APCD Rule 352. Please see www.ourair.org/wp-content/uploads/rule352.pdf for more information.

9. Boilers, water heaters, and process heaters (rated between 75,000 and 2.0 million Btu/hr) must comply with the emission limits and certification requirements of APCD Rule 360. Note: Units fired on fuel(s) other than natural gas still need to be certified under Rule 360. Please see www.ourair.org/wp-content/uploads/rule360.pdf for more information.

10. If contaminated soils are found at the project site, the District must be contacted to determine if Authority to Construct and/or Permit to Operate permits will be required. District permits are required for all soil vapor extraction activities. District permits are also required for the excavation, or "dig-and-haul", of more than 1,000 cubic yards of contaminated soil.

11. Advisory: The storage and transfer of diesel fuel is exempt from permit requirements under Rule 202 Section V.2 (*Storage and Transfer Equipment and Operations*) which exempts the storage of refined fuel oils with a gravity of 40° API or lower. Storage and transfer of other organic fuels may require a District permit. For more information see Rule 202 Section V.2 (www.ourair.org/wp-content/uploads/rule202.pdf) or contact APCD's Engineering Division at 805-961-8800.

12. At all times, idling of heavy-duty diesel trucks should be minimized; auxiliary power units should be used whenever possible. State law requires that:
    - Drivers of diesel-fueled commercial vehicles shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location.
    - Drivers of diesel-fueled commercial vehicles shall not idle a diesel-fueled auxiliary power system (APS) for more than 5 minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle. Trucks with 2007 or newer model year engines must meet additional requirements (verified clean APS label required).
    - See www.arb.ca.gov/noidle for more information.

13. At a minimum, prior to occupancy, any feasible greenhouse gas reduction measures from the following list should be applied to the project:
    - Energy use (energy efficiency, low carbon fuels, onsite renewable energy)
    - Water conservation (improved practices and equipment, landscaping)
    - Waste reduction (material re-use/recycling, composting, waste diversion/minimization)
    - Architectural features (green building practices, cool roofs)
    - Transportation (reduce vehicle miles traveled through employee commute trip reduction programs, such as ride-sharing programs and alternative transportation options, such as public transit, local shuttles, park-and-ride lots, etc.)
    - Electric Vehicle Infrastructure (EV charger installation, installation of pre-wiring for future EV chargers), see www.ourair.org/sbc/plug-in-central-coast and www.ourair.org/ev-charging-program for more information.

14. The application of architectural coatings, such as paints, primers, and sealers that are applied to buildings or stationary structures, shall comply with District Rule 323.1, *Architectural Coatings* that places limits on the VOC-content of coating products.

15. Asphalt paving activities shall comply with District Rule 329, *Cutback and Emulsified Asphalt Paving Materials*.

If you or the project applicant have any questions regarding these comments, please feel free to contact me at [redacted] or via email at [redacted]

Sincerely,

Carly Barham

Carly Barham
Planning Division

Attachments: Attachment A – Fugitive Dust Control Measures
Attachment B – Diesel Particulate and NO_x Emission Measures
Attachment C – CalEEMod Reports (Daily and Annual Emission Estimates)

cc: Michael Goldman, Manager, District Engineering Division
Kim Harding, Environmental Protection Specialist, 30 CES/CEIEC, [redacted]
Chron File

air pollution control district
SANTA BARBARA COUNTY

ATTACHMENT A
FUGITIVE DUST CONTROL MEASURES

These measures are required for all projects involving earthmoving activities regardless of the project size or duration. Projects are expected to manage fugitive dust emissions such that emissions do not exceed APCD's visible emissions limit (APCD Rule 302), create a public nuisance (APCD Rule 303), and are in compliance with the APCD's requirements and standards for visible dust (APCD Rule 345).

- During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site and from exceeding the APCD's limit of 20% opacity for greater than 3 minutes in any 60 minute period. At a minimum, this should include wetting down such areas in the late morning and after work is completed for the day. Increased watering frequency should be required when sustained wind speed exceeds 15 mph. Reclaimed water should be used whenever possible. However, reclaimed water should not be used in or around crops for human consumption.
- Onsite vehicle speeds shall be no greater than 15 miles per hour when traveling on unpaved surfaces.
- Install and operate a track-out prevention device where vehicles enter and exit unpaved roads onto paved streets. The track-out prevention device can include any device or combination of devices that are effective at preventing track out of dirt such as gravel pads, pipe-grid track-out control devices, rumble strips, or wheel-washing systems.
- If importation, exportation, and stockpiling of fill material is involved, soil stockpiled for more than one day shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin.
- Minimize the amount of disturbed area. After clearing, grading, earthmoving, or excavation is completed, treat the disturbed area by watering, OR using roll-compaction, OR revegetating, OR by spreading soil binders until the area is paved or otherwise developed so that dust generation will not occur. All roadways, driveways, sidewalks etc. to be paved should be completed as soon as possible.
- Schedule clearing, grading, earthmoving, and excavation activities during periods of low wind speed to the extent feasible. During periods of high winds (>25 mph) clearing, grading, earthmoving, and excavation operations shall be minimized to prevent fugitive dust created by onsite operations from becoming a nuisance or hazard.
- The contractor or builder shall designate a person or persons to monitor and document the dust control program requirements to ensure any fugitive dust emissions do not result in a nuisance and to enhance the implementation of the mitigation measures as necessary to prevent transport of dust offsite. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the Air Pollution Control District prior to grading/building permit issuance and/or map clearance.

PLAN REQUIREMENTS: All requirements shall be shown on grading and building plans and/or as a separate information sheet listing the conditions of approval to be recorded with the map. **Timing**: Requirements shall be shown on plans prior to grading/building permit issuance and/or recorded with the map during map recordation. Conditions shall be adhered to throughout all grading and construction periods.

MONITORING: The Lead Agency shall ensure measures are on project plans and/or recorded with maps. The Lead Agency staff shall ensure compliance onsite. APCD inspectors will respond to nuisance complaints.

air pollution control district
SANTA BARBARA COUNTY

ATTACHMENT B
DIESEL PARTICULATE AND NO_X EMISSION REDUCTION MEASURES

Particulate emissions from diesel exhaust are classified as carcinogenic by the state of California. The following is a list of regulatory requirements and control strategies that should be implemented to the maximum extent feasible.

The following measures are required by state law:

- All portable diesel-powered construction equipment greater than 50 brake horsepower (bhp) shall be registered with the state's portable equipment registration program OR shall obtain an APCD permit.
- Fleet owners of diesel-powered mobile construction equipment greater than 25 hp are subject to the California Air Resource Board (CARB) In-Use Off-Road Diesel-Fueled Fleets Regulation (Title 13, California Code of Regulations (CCR), §2449), the purpose of which is to reduce oxides of nitrogen (NOx), diesel particulate matter (DPM), and other criteria pollutant emissions from in-use off-road diesel-fueled vehicles. Off-road heavy-duty trucks shall comply with the State Off-Road Regulation. For more information, see www.arb.ca.gov/msprog/ordiesel/ordiesel.htm.
- Fleet owners of diesel-fueled heavy-duty trucks and buses are subject to CARB's On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation (Title 13, CCR, §2025), the purpose of which is to reduce DPM, NOx and other criteria pollutants from in-use (on-road) diesel-fueled vehicles. For more information, see www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm.
- All commercial off-road and on-road diesel vehicles are subject, respectively, to Title 13, CCR, §2449(d)(3) and §2485, limiting engine idling time. Off-road vehicles subject to the State Off-Road Regulation are limited to idling no more than five minutes. Idling of heavy-duty diesel trucks during loading and unloading shall be limited to five minutes, unless the truck engine meets the optional low-NOx idling emission standard, the truck is labeled with a clean-idle sticker, and it is not operating within 100 feet of a restricted area.

The following measures are recommended:

- Diesel equipment meeting the CARB Tier 3 or higher emission standards for off-road heavy-duty diesel engines should be used to the maximum extent feasible.
- On-road heavy-duty equipment with model year 2010 engines or newer should be used to the maximum extent feasible.
- Diesel powered equipment should be replaced by electric equipment whenever feasible. Electric auxiliary power units should be used to the maximum extent feasible.
- Equipment/vehicles using alternative fuels, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane or biodiesel, should be used on-site where feasible.
- Catalytic converters shall be installed on gasoline-powered equipment, if feasible.
- All construction equipment shall be maintained in tune per the manufacturer's specifications.
- The engine size of construction equipment shall be the minimum practical size.
- The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time.
- Construction worker trips should be minimized by requiring carpooling and by providing for lunch onsite.
- Construction truck trips should be scheduled during non-peak hours to reduce peak hour emissions whenever feasible.
- Proposed truck routes should minimize to the extent feasible impacts to residential communities and sensitive receptors.
- Construction staging areas should be located away from sensitive receptors such that exhaust and other construction emissions do not enter the fresh air intakes to buildings, air conditioners, and windows.

PLAN REQUIREMENTS AND TIMING: Prior to grading/building permit issuance and/or map recordation, all requirements shall be shown as conditions of approval on grading/building plans, and/or on a separate sheet to be recorded with the map. Conditions shall be adhered to throughout all grading and construction periods. The contractor shall retain the Certificate of Compliance for CARB's In-Use Regulation for Off-Road Diesel Vehicles onsite and have it available for inspection.

MONITORING: The Lead Agency shall ensure measures are on project plans and/or recorded with maps. The Lead Agency staff shall ensure compliance onsite. APCD inspectors will respond to nuisance complaints.

VAFB Space Command

Santa Barbara County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Government Office Building	498.00	1000sqft	11.43	498,000.00	1870
Parking Lot	502.00	1000sqft	11.52	502,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Based on project description in EA.

Vehicle Trips - Trip rate adjusted from program default to match proposed trips assumed in EA (1870 Employees = 3740 trips). Rate presented in terms of trips/SF (3740trips/498SF=7.51 trips/SF). Assumed trips are all primary and all commercial-work since only trips from employees in EA. Changed trip length from project default to match information provided in EA, 10-mile one-way commute.

Table Name	Column Name	Default Value	New Value
tblLandUse	Population	0.00	1,870.00
tblVehicleTrips	CC_TTP	62.00	0.00
tblVehicleTrips	CNW_TTP	5.00	0.00
tblVehicleTrips	CW_TL	6.60	10.00
tblVehicleTrips	CW_TTP	33.00	100.00
tblVehicleTrips	DV_TP	34.00	0.00
tblVehicleTrips	PB_TP	16.00	0.00
tblVehicleTrips	PR_TP	50.00	100.00
tblVehicleTrips	WD_TR	68.93	7.51

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.8077	54.5753	33.9063	0.0882	18.1799	2.3911	20.5711	9.9608	2.1998	12.1607	0.0000	9,040.7718	9,040.7718	1.9471	0.0000	9,066.5362
2020	3.9193	38.0543	31.5682	0.0872	3.3079	1.2287	4.5366	0.8994	1.1566	2.0560	0.0000	8,914.7220	8,914.7220	1.0051	0.0000	8,939.8485
2021	594.9416	34.7271	29.8198	0.0861	3.3079	1.0215	4.3294	0.8994	0.9609	1.8603	0.0000	8,809.0549	8,809.0549	0.9902	0.0000	8,833.8087
Maximum	**594.9416**	**54.5753**	**33.9063**	**0.0882**	**18.1799**	**2.3911**	**20.5711**	**9.9608**	**2.1998**	**12.1607**	**0.0000**	**9,040.7718**	**9,040.7718**	**1.9471**	**0.0000**	**9,066.5362**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.8077	54.5753	33.9063	0.0882	18.1799	2.3911	20.5711	9.9608	2.1998	12.1607	0.0000	9,040.7718	9,040.7718	1.9471	0.0000	9,066.5362
2020	3.9193	38.0543	31.5682	0.0872	3.3079	1.2287	4.5366	0.8994	1.1566	2.0560	0.0000	8,914.7220	8,914.7220	1.0051	0.0000	8,939.8485
2021	594.9416	34.7271	29.8198	0.0861	3.3079	1.0215	4.3294	0.8994	0.9609	1.8603	0.0000	8,809.0549	8,809.0549	0.9902	0.0000	8,833.8087
Maximum	**594.9416**	**54.5753**	**33.9063**	**0.0882**	**18.1799**	**2.3911**	**20.5711**	**9.9608**	**2.1998**	**12.1607**	**0.0000**	**9,040.7718**	**9,040.7718**	**1.9471**	**0.0000**	**9,066.5362**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	14.1022	9.4000e-004	0.1025	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2189	0.2189	5.8000e-004		0.2334
Energy	0.2409	2.1897	1.8394	0.0131		0.1664	0.1664		0.1664	0.1664		2,627.6422	2,627.6422	0.0504	0.0482	2,643.2570
Mobile	8.5805	35.2496	108.7006	0.3127	29.0127	0.2986	29.3112	7.7797	0.2803	8.0600		31,655.2873	31,655.2873	1.4419		31,691.3358
Total	**22.9235**	**37.4403**	**110.6424**	**0.3258**	**29.0127**	**0.4653**	**29.4780**	**7.7797**	**0.4471**	**8.2268**		**34,283.1484**	**34,283.1484**	**1.4929**	**0.0482**	**34,334.8262**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	14.1022	9.4000e-004	0.1025	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004		0.2189	0.2189	5.8000e-004		0.2334
Energy	0.2409	2.1897	1.8394	0.0131		0.1664	0.1664		0.1664	0.1664		2,627.6422	2,627.6422	0.0504	0.0482	2,643.2570
Mobile	8.5805	35.2496	108.7006	0.3127	29.0127	0.2986	29.3112	7.7797	0.2803	8.0600		31,655.2873	31,655.2873	1.4419		31,691.3358
Total	**22.9235**	**37.4403**	**110.6424**	**0.3258**	**29.0127**	**0.4653**	**29.4780**	**7.7797**	**0.4471**	**8.2268**		**34,283.1484**	**34,283.1484**	**1.4929**	**0.0482**	**34,334.8262**

VAFB Space Command

Santa Barbara County APCD Air District, Annual

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tblVehicleTrips	DV_TP	34.00	0.00
tblVehicleTrips	PB_TP	16.00	0.00
tblVehicleTrips	PR_TP	50.00	100.00
tblVehicleTrips	WD_TR	68.93	7.51

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

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Year	tons/yr										MT/yr					
2019	0.2114	2.1950	1.4627	3.0500e-003	0.2960	0.0943	0.3902	0.1272	0.0874	0.2146	0.0000	278.1475	278.1475	0.0606	0.0000	279.6622
2020	0.5196	5.0293	4.1899	0.0113	0.4243	0.1611	0.5854	0.1156	0.1517	0.2673	0.0000	1,049.0282	1,049.0282	0.1202	0.0000	1,052.0334
2021	6.1142	1.4944	1.3460	3.5900e-003	0.1302	0.0471	0.1773	0.0354	0.0442	0.0797	0.0000	331.5744	331.5744	0.0416	0.0000	332.6141
Maximum	**6.1142**	**5.0293**	**4.1899**	**0.0113**	**0.4243**	**0.1611**	**0.5854**	**0.1272**	**0.1517**	**0.2673**	**0.0000**	**1,049.0282**	**1,049.0282**	**0.1202**	**0.0000**	**1,052.0334**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2114	2.1950	1.4627	3.0500e-003	0.2960	0.0943	0.3902	0.1272	0.0874	0.2146	0.0000	278.1473	278.1473	0.0606	0.0000	279.6620
2020	0.5196	5.0293	4.1899	0.0113	0.4243	0.1611	0.5854	0.1156	0.1517	0.2673	0.0000	1,049.0278	1,049.0278	0.1202	0.0000	1,052.0331
2021	6.1142	1.4944	1.3460	3.5900e-003	0.1302	0.0471	0.1773	0.0354	0.0442	0.0797	0.0000	331.5743	331.5743	0.0416	0.0000	332.6140
Maximum	**6.1142**	**5.0293**	**4.1899**	**0.0113**	**0.4243**	**0.1611**	**0.5854**	**0.1272**	**0.1517**	**0.2673**	**0.0000**	**1,049.0278**	**1,049.0278**	**0.1202**	**0.0000**	**1,052.0331**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	8-20-2019	11-19-2019	1.7001	1.7001
2	11-20-2019	2-19-2020	1.4518	1.4518
3	2-20-2020	5-19-2020	1.3530	1.3530
4	5-20-2020	8-19-2020	1.3791	1.3791
5	8-20-2020	11-19-2020	1.3839	1.3839
6	11-20-2020	2-19-2021	1.3202	1.3202
7	2-20-2021	5-19-2021	1.3925	1.3925
8	5-20-2021	8-19-2021	5.5401	5.5401
		Highest	5.5401	5.5401

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.5728	8.0000e-005	9.2200e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0179	0.0179	5.0000e-005	0.0000	0.0191
Energy	0.0440	0.3996	0.3357	2.4000e-003		0.0304	0.0304		0.0304	0.0304	0.0000	3,069.2506	3,069.2506	0.1275	0.0326	3,082.1574
Mobile	1.0918	4.8080	14.3549	0.0399	3.6902	0.0389	3.7291	0.9914	0.0365	1.0279	0.0000	3,663.4511	3,663.4511	0.1707	0.0000	3,667.7189
Waste						0.0000	0.0000		0.0000	0.0000	96.1772	0.0000	96.1772	4.7691	0.0000	215.4052
Water						0.0000	0.0000		0.0000	0.0000	35.0025	217.4709	252.4734	0.1303	0.0782	279.0208
Total	**3.7085**	**5.2077**	**14.6998**	**0.0423**	**3.6902**	**0.0693**	**3.7595**	**0.9914**	**0.0669**	**1.0583**	**131.1797**	**6,950.1905**	**7,081.3702**	**5.1976**	**0.1108**	**7,244.3214**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.5728	8.0000e-005	9.2200e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0179	0.0179	5.0000e-005	0.0000	0.0191
Energy	0.0440	0.3996	0.3357	2.4000e-003		0.0304	0.0304		0.0304	0.0304	0.0000	3,069.2506	3,069.2506	0.1275	0.0326	3,082.1574
Mobile	1.0918	4.8080	14.3549	0.0399	3.6902	0.0389	3.7291	0.9914	0.0365	1.0279	0.0000	3,663.4511	3,663.4511	0.1707	0.0000	3,667.7189
Waste						0.0000	0.0000		0.0000	0.0000	96.1772	0.0000	96.1772	4.7691	0.0000	215.4052
Water						0.0000	0.0000		0.0000	0.0000	35.0025	217.4709	252.4734	0.1303	0.0782	279.0208
Total	**3.7085**	**5.2077**	**14.6998**	**0.0423**	**3.6902**	**0.0693**	**3.7595**	**0.9914**	**0.0669**	**1.0583**	**131.1797**	**6,950.1905**	**7,081.3702**	**5.1976**	**0.1108**	**7,244.3214**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Bob LeGare
Mayor
[redacted]
phone [redacted]
email [redacted]

City of Aurora

August 23, 2019

Ms. Michelle Linn
Headquarters Air Force Space Command
[redacted]

Dear Ms. Linn,

The city of Aurora appreciates the opportunity to comment on the Department of the Air Force's Environmental Assessment for the proposed basing and construction of the United States Space Command Headquarters. The city has a long and proud tradition of supporting operations at Buckley Air Force Base. One of the city's highest priorities is to support the ongoing mission at the Base to advocate for the Base to house additional missions.

Toward that end, the city has prioritized the widening and extension of 6th Avenue to better support access to the Base. The city of Aurora has also been engaged in a mission-supportive endeavor during the past several years to plan and implement a Compatible Use Buffer Project with a focus on preventing incompatible development around the Base.

The city supports the Department's assessments of the cumulative impacts of the proposed action at Buckley in the following areas: Water Resources, Geology and Paleontological Resources, Cultural Resources, Biological Resources, Air Quality, Socioeconomics, Hazardous Materials, and Waste, and Transportation.

As the Department continues its evaluation of potential locations for the Headquarters of the United States Space Command, please know that the city of Aurora is available to the Department as a resource for any information it may need to make its final determination.

Sincerely,

Bob LeGare, Mayor
Aurora, Colorado

DEPARTMENT OF TRANSPORTATION
CALTRANS DISTRICT 5
[redacted]
PHONE [redacted]
FAX [redacted]
TTY [redacted]
www.dot.ca.gov/dist05/

Making Conservation a California Way of Life.

August 23, 2019

SB-1-M29.73
USSPACECOM

Russell Perry
HQ AFSPC/A4C
[redacted]

COMMENTS FOR THE DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI) ENVIRONMENTAL ASSESSMENT FOR UNITED STATES SPACE COMMAND HEADQUARTERS BASING AND CONSTRUCTION (USSPACECOM) PROJECT

Dear Mr. Perry:

The California Department of Transportation (Caltrans) appreciates the opportunity to review the FONSI FOR THE USSPACECOM. The comments contained in this letter specifically address the proposed Vandenberg AFB site, which is located within Caltrans District 5 region. Caltrans offers the following comments:

- Caltrans supports local planning efforts that are consistent with State planning priorities intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety. We accomplish this by working with local jurisdictions to achieve a shared vision of how the transportation system should and can accommodate interregional and local travel.

- Projects that support smart growth principles which include improvements to pedestrian, bicycle, and transit infrastructure (or other key Transportation Demand Strategies) are supported by Caltrans and are consistent with our mission, vision, and goals.

- Please be aware that if any work is completed in the State's right-of-way it will require an encroachment permit from Caltrans and must be done to our engineering and environmental standards, and at no cost to the State. The conditions of approval and the requirements for the encroachment permit are issued at the sole discretion of the Permits Office, and nothing in this letter shall be implied as limiting those future conditioned and requirements. For more information regarding the encroachment permit process, please visit our

Encroachment Permit Website at:
http://www.dot.ca.gov/trafficops/ep/index.html.

- Please provide a copy of the Traffic Impact Analysis (TIA) and technical appendices including modeling. The TIA should consider traffic impacts to the State Highway System (SHS), during all phases of this project including construction, interim site, and permanent site completion.

- Additionally, the Socioeconomic and Environmental Justice section of the FONSI indicates a lack of available housing in the VAFB area for the approximate 1,870 new staff. The increase in traffic impacts will likely impact the SHS on a wider regional scale dependent upon where available housing is located. We acknowledge the mitigations measures included in the FONSI, but additional measures may be necessary and should be addressed in the requested TIA.

We look forward to continued coordination with the US Air Force on this project. If you have any questions, or need further clarification on items discussed above, please contact me at [redacted] or [redacted]

Sincerely,

Ingrid McRoberts

Ingrid McRoberts
Development Review Coordinator
District 5, LD-IGR South Branch

cc: City of Lompoc
City of Santa Maria
Vandenburg Village CSD
County of Santa Barbara
SBCAG

Lance R. LeFleur
Director

ADEM

Alabama Department of Environmental Management
adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 ▪ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ▪ FAX (334) 271-7950

Kay Ivey
Governor

August 29, 2019

CERTIFIED MAIL # [redacted]

Ms. Michelle Linn
Headquarters Air Force Space Command
[redacted]

RE: **ADEM Review:** *United States Space Command (USSPACECOM) Basing and Construction Draft Environmental Assessment (EA) / Draft Finding of No Significant Impact (FONSI),* dated July 2019
Redstone Arsenal (RSA)
U.S. EPA I.D. No. [redacted]

Dear Ms. Linn:

The Alabama Department of Environmental Management (ADEM or the Department) has reviewed the *United States Space Command (USSPACECOM) Basing and Construction Draft Environmental Assessment (EA) / Draft Finding of No Significant Impact (FONSI),* dated July 2019. Based on this review, the Department has no comments or significant concerns regarding the EA/FONSI to offer at this time. However, it should be noted that there are groundwater installation wide land use controls (LUCs) that restrict the use of groundwater at Redstone Arsenal. Therefore, these LUCs should be considered in the event the proposed work would result in contact with site groundwater. In addition, there appears to be a minor typographical error on Page 2-32, Figure 2.3-17. The legend indicates that the installation is "Buckley Air Force Base" and should be referenced as "Redstone Arsenal".

Also, it is possible to encounter contaminants that have not been determined by previous investigations. If contamination is suspected and/or encountered, the Department should be notified as soon as possible.

If you have any questions on this matter, please contact Philip Stroud of the Facilities Engineering Section at [redacted] or via e-mail at [redacted]

Sincerely,

Jason Wilson, Chief
Governmental Hazardous Waste Branch
Land Division

JW/RDA/PS/tp

cc: Clint Howard, Redstone Arsenal (via email)

3 State of California • Natural Resources Agency Gavin Newsom, *Governor*

DEPARTMENT OF PARKS AND RECREATION
OFFICE OF HISTORIC PRESERVATION
Lisa Ann L. Mangat, *Director*

Julianne Polanco, State Historic Preservation Officer
1725 23rd Street, Suite 100, Sacramento, CA 95816-7100
Telephone: (916) 445-7000 FAX: (916) 445-7053
calshpo.ohp@parks.ca.gov www.ohp.parks.ca.gov

October 4, 2019

Reply in Reference to: USAF_2019_0906_001

LtCol Jason Aftanas
Commander, 30th Civil Engineer Squadron
1172 Iceland Avenue
Vandenberg AFB, CA 93437-6011

VIA ELECTRONIC MAIL

Re: Section 106 Consultation for Construction and Basing of US Space Command Headquarters, Vandenberg AFB

Dear LtCol Aftanas:

The United States Air Force (USAF) is initiating consultation with the State Historic Preservation Officer (SHPO) regarding their effort to comply with Section 106 of the National Historic Preservation Act of 1966 (54 U.S.C. 306108), as amended, and its implementing regulation found at 36 CFR Part 800.

The USAF has chosen Vandenberg AFB (VAFB) as one of four potential locations for the construction and basing of the US Space Command Headquarters. Project activities include grading, excavation and installation of utilities, parking, sidewalks, curbs, security and other support features commensurate with the construction of an approximately 500,000 sf, four story building. The USAF identified an interim site alternative in three separate facilities within VAFB in three separate locations that would require renovation and other improvements.

Results of a pedestrian survey, Native American notification and records search of the proposed 23-acre permanent site alternative were negative for recorded subsurface resources. The USAF evaluated the following 11 facilities constructed between 1959-1969, inclusive of the three facilities subject to the interim alternative, for National Register of Historic Places (NRHP) inclusion: 6523, 7525, 10577, 7403, 7414, 7420, 7425, 7437, 8190, 8305 and 8312.

The USAF is requesting concurrence with its delineation of the undertaking's area of potential effects (APE), its determination that the 11 evaluated facilities do not meet NRHP eligibility requirements and its finding of no historic properties affected pursuant to 36 CFR Part 800.4(d)(1). Upon review of the USAF's supporting documentation, the SHPO offers the following comments:

1) The SHPO concurs that the 11 facilities evaluated by the USAF in support of its obligations under 36 CFR Part 800.4 (c)(1) do not meet NRHP eligibility requirements.

2) The USAF's reliance on alternatives for this project indicates that SHPO concurrence will inform its preferred action under the National Environmental Protection Act. The SHPO reminds the USAF that pursuant to 36 CFR Part 800.8(c) "an agency official may use the process and documentation required for the preparation of an EA/FONSI or an EIS/ROD to comply with section 106 in lieu of the procedures set forth in 36 CFR Part 800.3-800.6 if the agency official has notified in advance the SHPO/THPO and the Council that it intends to do so…" Furthermore, according to Advisory Council on Historic Preservation guidance, planning activities that do not narrow the range of alternatives to avoid, minimize, or mitigate adverse effects to historic properties are not subject to review under Section 106 of the National Historic Preservation Act. However, instances where a planning document commits the agency to a decision regarding the use of resources or the location of a project confirms the agency has restricted the availability of alternatives to avoid, minimize, or mitigate adverse effects the planning activity constitutes an undertaking that must be preceded by Section 106 compliance. As the USAF is consulting "for the VAFB alternative only" and did not adhere to the precepts stated above, the SHPO objects to the USAF's APE determination and finding of effect at this time and recommends the USAF initiate section 106 consultation should VAFB be selected as the preferred alternative.

If there are any questions, contact Ed Carroll, Historian II, at [redacted] or [redacted].

Sincerely,

Julianne Polanco
State Historic Preservation Officer

Organizations

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To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD
Subject: [Non-DoD Source] Comments on Space Command facilities expansion

From: Global Network [redacted]
Sent: Friday, July 26, 2019 1:11 PM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] Comments on Space Command facilities expansion

Here are our comments on the environmental assessment now under consideration for expansion of 'Space Command' facilities in the US.

1) The cost of a new arms race in space will be massive and we are in deep debt - we need to take care of Mother Earth and deal with climate change.

2) Space Force will necessitate huge numbers of rocket launches which pollute the environment and punch holes in the ozone layer.

3) We need to honor the United Nations Outer Space and Moon treaties that established that space should not be an arena of war. Instead the US should be negotiating a new treaty to ban all weapons in space. Russia and China for years have been urging the US to join them in doing so.

4) It is clear and obvious that the aerospace industry views space as a new profit center. The industry has identified the 'entitlement programs' (Social Security, Medicare, Medicaid and what little is left of the social safety net) as the new funding source to pay for their ambitious and dangerous plans for space control and domination in the coming years.

5) Select none of the proposed sites now under consideration. We can't afford to expand the 'Space Command' or 'Space Force' - what ever it may be called.

Bruce K. Gagnon
Coordinator
Global Network Against Weapons & Nuclear Power in Space
[redacted]
http://www.space4peace.org
http://space4peace.blogspot.com (blog)

'Thank God men cannot fly, and lay waste the sky as well as the earth.'
~ Henry David Thoreau

From: Beth Leake [redacted]
Sent: Thursday, August 8, 2019 11:25 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] HQ USSPACECOM

Mr. Perry, Thank you for the opportunity to comment on the USSPACECOM environmental assessment. I support the assessment that the vacant land at Peterson and Schriever AFBs is ideal for a new headquarters building. Furthermore, the Colorado Springs Chamber & EDC is already working to identify potential leased office space for the temporary headquarters facility.

Lastly, the socioeconomic climate in Colorado Springs is very supportive of both welcoming the new workforce, as well as providing an educated talent pool which is familiar with DoD and space disciplines.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

Best regards,

Beth Leake
Military Affairs Council (MAC) Coordinator
[redacted]

Colorado Springs CHAMBER & EDC™

cscedc.com | twitter | facebook | linkedin

From: Rocha, Randy [redacted]
Sent: Thursday, August 8, 2019 9:32 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] Re:Support USSPACECOM

Mr. Perry, Thank you for the opportunity to comment on the USSPACECOM environmental assessment. I support the assessment that the vacant land at Peterson and Schriever AFBs is ideal for a new headquarters building. Furthermore, the Colorado Springs Chamber & EDC is already working to identify potential leased office space for the temporary headquarters facility. The current infrastructure is in place to support USSPACECOM it is a natural fit backed with the strongest community support.

Lastly, the socioeconomic climate in Colorado Springs is very supportive of both welcoming the new workforce, as well as providing an educated talent pool which is familiar with DoD and space disciplines.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

Best regards,
Randy Rocha,
Colorado Springs Chamber and EDC Military Affairs, Treasurer

Randy Rocha
Director of Development
Executive Director Harrison School District Foundation
1060 Harrison Road
Colorado Springs, CO 80905
[redacted] office
[redacted] mobile
www.hsd2.org

SCHOOL DISTRICT TWO
HARRISON
Character Through Diversity, Challenge & Accomplishment

From: Evans, George D [redacted]
Sent: Monday, August 12, 2019 11:02 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] USSPACECOM in COS

Mr. Perry, Thank you for the opportunity to comment on the USSPACECOM environmental assessment. I support the assessment that the vacant land at Peterson and Schriever AFBs is ideal for a new headquarters building. Furthermore, the Colorado Springs Chamber & EDC is already working to identify potential leased office space for the temporary headquarters facility.

Lastly, the socioeconomic climate in Colorado Springs is very supportive of both welcoming the new workforce, as well as providing an educated talent pool which is familiar with DoD and space disciplines.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

Best regards,

George D. Evans III, MBA
Campus Director
Colorado Springs Campus

Colorado Springs, CO
Fort Carson, CO
Phone: [redacted]
Fax: [redacted]
Click here to Skype!

Embry-Riddle Aeronautical University
Florida | Arizona | Worldwide

From: Kevin Doran AC [redacted]
Sent: Tuesday, August 13, 2019 9:52 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] Comments on Proposed Action and Environmental Review - Draft EA for USSPACECOM Headquarters Basing and Construction

August 13, 2019

Mr. Russell Perry
HQ AFSPC/A4C
150 Vandenberg St. Suite 1105
Peterson AFB, CO 80914-4230

Via Email: [redacted]

Dear Mr. Perry,

After careful review of the *Draft Environmental Assessment* for the Basing and Construction of the United States Space Command (USSPACECOM) Headquarters, Accelerate Colorado has no issues with the environmental review and fully supports the proposed action of locating USSPACECOM at Buckley AFB in Aurora, Colorado.

Based on the Air Force's own findings presented in the environmental assessment (EA), the proposed action at Buckley AFB will have no adverse impacts on transportation, hazardous materials and waste, biological resources**,** geological and paleontological resources, and water resources. Furthermore, air quality impacts at Buckley AFB "would be below the applicable de minimis threshold at DoD installations". While there are some potential adverse effects on cultural resources at Buckley AFB, as identified in the EA, they would be "minimized by factors such as distance from the resource, and the duration and timing of construction activities". Conversely, according to the EA, the Proposed Action at Buckley AFB "would contribute to positive impacts on socioeconomic conditions resulting from construction of past, present, and reasonably foreseeable future projects by bringing new temporary workers (ranging from 5 to 60 at any given time) to the area who would make purchases at local businesses."

Taken as a whole, the Proposed Action at Buckley AFB would be a net positive for the USAF, USSPACECOM, Buckley AFB, the City of Aurora, Arapahoe County, and the State of Colorado. Additionally, the City of Aurora has taken numerous steps to foster a great working relationship with the Base to ensure its future viability for the Air Force and cement its place as a valuable member of the Aurora community. To that end, the City of Aurora has been engaged in a mission-supportive endeavor during the past few years to plan and implement a Buckley AFB Compatible Use Buffer Project with a focus on preventing incompatible development around the base. The City, in conjunction with the Trust for Public Land (TPL), is collaborating with other project stakeholders to acquire over 1,000 acres of privately-owned land adjacent to Buckley AFB to buffer the base boundaries, and over the past 20 years, Aurora and Arapahoe County have purchased over 2,200 acres of park and open space properties surrounding or near Buckley AFB at a cost of $25M. The acquisition of these properties provided the basis for the current buffer project.

Given the City of Aurora and Arapahoe County's efforts to enshrine Buckley AFB's presence in the community and the positive impacts the Proposed Action will have, Accelerate Colorado fully supports locating USSPACECOM at Buckley AFB in Aurora, Colorado. Thank you for your consideration.

Sincerely,

Kevin R. Doran
Executive Director
Accelerate Colorado
12510 E. Iliff Avenue, Suite 115
Aurora, CO 80014
O: [redacted]
M: [redacted]
[redacted]

From: Wysocki, Joseph (Joe)[redacted]
Sent: Monday, August 19, 2019 7:39 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] USSPACECOM EA

Dear Mr. Perry,
Thank you for the opportunity to comment on the USSPACECOM environmental assessment. I support the assessment that the vacant land at Peterson and Schriever AFBs is ideal for a new headquarters building. Furthermore, with our Colorado Springs Chamber & Economic Development Corporation already working to identify potential leased office space for the temporary headquarters facility, establishing the Headquarters here in Colorado Springs will be the faster and less costly approach.

The socioeconomic climate in Colorado Springs is very supportive of both welcoming the new workforce, as well as providing an educated talent pool which is familiar with DoD and space disciplines. As a retired USAF space officer and former member of the *first* USSPACECOM, I can assure you that no other location in the United States has the ready workforce and mission expertise that compares to what we have in our city.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

Very respectfully,

Joe Wysocki
Vice President and Group Lead
Joint Space and Strategic Capabilities
Systems Planning and Analysis, Inc.
Office: [redacted]
Mobile: [redacted]
[redacted]

From: Reggie Ash [redacted]
Sent: Friday, August 23, 2019 9:24 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD[redacted]
Subject: [Non-DoD Source] Comments on the USSPACECOM Draft Environmental Assessment

Mr. Perry, I appreciate the opportunity to comment on the draft environmental assessment for USSPACECOM. I support the findings in the assessment.

Considering the socioeconomic analysis, Colorado Springs receives compliments from industry professionals on our workforce development programs. I'm quite confident USSPACECOM will find that Colorado Springs meets their workforce needs, especially considering Air Force Space Command designated the University of Colorado Colorado Springs as the Space Consortium's lead university.

As a former Commander of the 21st Mission Support Group, I'm quite familiar with the base 2050 Plan, and specifically the Area Development Plans for the HQ Complex and the Golf Course. I believe installing flat parking lots on the recently acquired parcels near the runway approach provide a viable option worth further exploration. Additionally, in the near future I expect Colorado Springs to offer a plan to build an office complex on the current golf course, with an offer to allow military use of a public or private golf course at the same cost as a military course. Previously, 21 CES had a plan for this development as an annex to the 2050 Plan.

I was excited to see the announcement that USSPACECOM will be tentatively located in Colorado Springs during its stand-up phase! As the business community's lead liaison to the military in Colorado Springs, I know the entire community is energized to assist that stand-up. We also fully support the permanent basing of HQ USSPACECOM at either Peterson or Schriever AFB.

V/R
Reggie

Reggie Ash
Chief Defense Development Officer
Tel: [redacted] | Cell: [redacted]

From: Eleanor Martinez [redacted]
Sent: Friday, August 23, 2019 12:39 PM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] Support for USSPACECOM

Mr. Perry:

On behalf of Kyle H. Hybl, Air Force Civic Leader, please accept his comments in support for USSPACECOM.

Dear Mr. Perry:

Thank you for the opportunity to comment on the USSPACECOM environmental assessment. I support the assessment that the vacant land at Peterson AFB and Schriever AFB is ideal for a new headquarters building. Furthermore, the Colorado Springs Chamber & EDC is already working to identify potential leased office space for the temporary headquarters facility.

Lastly, the socioeconomic climate in Colorado Springs is very supportive of both welcoming the new workforce, as well as providing an educated talent pool which is familiar with DoD and space disciplines.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

Best regards,

Kyle

Please let me know if you need anything else or have questions.

Thank you

Eleanor Martinez

Executive Assistant to Kyle H. Hybl

[redacted]

From: Vincent Persichetti [redacted]
Sent: Friday, August 23, 2019 10:08 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] Comments on the USSPACECOM Draft Environmental Assessment

Mr. Perry, I appreciate the opportunity to add my voice to those who've commented on the draft environmental assessment for USSPACECOM. I support the findings in the assessment.

Considering the socioeconomic analysis, Colorado Springs receives compliments from industry professionals on our workforce development programs. I'm quite confident USSPACECOM will find that Colorado Springs meets their workforce needs, especially considering Air Force Space Command designated the University of Colorado Colorado Springs as the Space Consortium's lead university and Colorado Springs-based National Cybersecurity Center is standing up the nation's first Space Information Sharing and Analysis Center.

As a former Superintendent of the 21st Mission Support Group, I'm quite familiar with the base 2050 Plan, and specifically the Area Development Plans for the HQ Complex and the Golf Course. I believe installing flat parking lots on the recently acquired parcels near the runway approach provide a viable option worth further exploration. Additionally, in the near future I expect Colorado Springs to offer a plan to build an office complex on the current golf course, with an offer to allow military use of a public or private golf course at the same cost as a military course. Previously, 21 CES had a plan for this development as an annex to the 2050 Plan.

I was excited to see the announcement that USSPACECOM will be tentatively located in Colorado Springs during its stand-up phase! I know the entire community is energized to assist that stand-up. We also fully support the permanent basing of HQ USSPACECOM at either Peterson or Schriever AFB.

v/r

Vincent "Vinnie" Persichetti

Vincent Persichetti
Cybersecurity Programs Director
Tel: [redacted]

Colorado Springs
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Individuals

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From: Aileen Berrios [redacted]
Sent: Thursday, August 8, 2019 12:44 PM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Cc: [redacted] Beth Leake [redacted]
Subject: [Non-DoD Source] HQ USSPACECOM

Mr. Perry,

Thank you for the opportunity to comment on the USSPACECOM environmental assessment.

As a business owner in this community and as a long-term banker; I support the assessment that the vacant land at Peterson and Schriever AFBs is ideal for a new headquarters building.

I feel that Colorado Springs can continue to support the additional new workforce. I have personally hired (for our business Rapido Rolloff & D2 Demo & Dirt) two retired military personnel and looking at a third.

My father was a Command Master Sergeant and retired from Fort Carson plus our family has four graduates (two generations) from the Air Force Academy. So the military and their presence here is near and dear to my heart.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

Best regards, Aileen Berrios

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Better Banking = Better Business

Aileen Berrios
[redacted]
SVP Commercial Banking

Office [redacted]
Direct [redacted]
Cell [redacted]

[redacted]

www.5star.bank

-----Original Message-----
From: James Ross [redacted]
Sent: Thursday, August 8, 2019 3:32 PM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] Support for HQ USSPACECOM in Colorado Springs

Mr. Perry,

Thank you for the opportunity to comment on the USSPACECOM environmental assessment. I support the assessment that the vacant land at Peterson and Schriever AFBs is ideal for a new headquarters building. Furthermore, the Colorado Springs Chamber & EDC is already working to identify potential leased office space for the temporary headquarters facility.

In addition, the socioeconomic climate in Colorado Springs is very supportive of both welcoming the new workforce, as well as providing an educated talent pool and numerous industry partners which are experts in DoD and space disciplines.

Finally, as a former 50th Space Wing Commander at Schriever AFB (2011-2013), I can add that in my 24+ years in the United States Air Force, including four command positions, Colorado Springs is by far the community with the most support of the military in which I had the pleasure to live and serve. It was because of this that my wife and I decided to live in Colorado Springs after I retired from the Air Force.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

Best regards,

James P. Ross
Colonel, USAF (ret)

From: Marv Strait [redacted]
Sent: Thursday, August 8, 2019 10:48 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] USSPACECOM Headquarters

Dear Mr. Perry
Thank you for the opportunity to comment on the USSPACECOM environmental assessment. I support the assessment that the vacant land at Peterson and Schriever AFBs is ideal for a new headquarters building. Furthermore, the Colorado Springs Chamber & EDC is already working to identify potential leased office space for the temporary headquarters facility.

Lastly, the socioeconomic climate in Colorado Springs is very supportive of both welcoming the new workforce, as well as providing an educated talent pool which is familiar with DoD and space disciplines.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

Best regards,
Marvin Strait, CPA

From: Gayle White [redacted]
Sent: Thursday, August 8, 2019 8:54 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD [redacted]
Subject: [Non-DoD Source] Support for US Space Command Environmental Assessment

Mr. Perry,

I am a member of the Colorado Springs community and I appreciate the opportunity to comment on the USSPACECOM environmental assessment. I support the use of vacant land for a new headquarters building.

More importantly, I was part of AF Space Command when USSPACECOM was stood up in Colorado Springs in the early 1980s and saw how beneficial colocation was to mission success. Since retiring I have been a part of the business community (for the past 32 years and still own a business) and I can assure you that the community will be very supportive of a new organization in our city. There is an educated talent pool which is familiar with DoD and space disciplines.

I strongly support basing HQ USSPACECOM in our community.

Sincerely,

Gayle White
Lt Col (USAF) Retired

From: jenifer furda [redacted]
Sent: Friday, August 9, 2019 11:57 AM
To: PERRY, RUSSELL E GS-13 USAF AFSPC AFSPC/A4CD[redacted]
Subject: [Non-DoD Source] Colorado Springs, CO

Hello Mr. Perry! I just wanted to write a note of support for the new HQ of the US Space Command to be in Colorado Springs, CO. We as a community love our military, aerospace, DoD and all the support services that go with it. We are a world class community with lots of cyber and space already here...so it makes sense. AND not only do we support the military member...we support their spouses and their families. Peterson and or Schriever would be a perfect sport for those new HQ.

AND AND AND we have an excellent University that could help supply your workforce needs.

I wholeheartedly support basing HQ USSPACECOM at either Peterson or Schriever AFB.

-Jenifer Furda

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U.S. Air Force

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE SPACE COMMAND

3 June 2019

Ms. Michelle Linn
Headquarters Air Force Space Command Civil Engineer
[redacted]

Mr. Steve Turner
Office of Archaeology and Historic Preservation
History Colorado
[redacted]

Dear Mr. Turner

This letter serves to initiate consultation in accordance with Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 306108, regarding an action being analyzed in a National Environmental Policy Act (NEPA) Environmental Assessment (EA). The Air Force is proposing to establish a permanent United States Space Command (USSPACECOM) headquarters at one of six military installations located within the United States.

Section 1601(c) of the Fiscal Year 18 (FY18) National Defense Authorization Act (NDAA) directed the Deputy Secretary of Defense (DepSecDef) to review national security space DoD components and make recommendations to Congress by August 1, 2018. The DepSecDef's final report recommended that the President of the United States modify the Unified Command Plan (UCP) to stand up a new combatant command for space, USSPACECOM. As such, a permanent headquarters must be established in order to meet full operational capability requirements. Three of the potential locations being analyzed in the EA are within Colorado: Peterson Air Force Base, Schriever Air Force Base, and Buckley Air Force Base. The Cheyenne Mountain Air Force Station had been under consideration as well, but has been eliminated from the NEPA analysis.

It is currently estimated that USSPACECOM will require permanent facility construction to accommodate approximately 1,861 personnel in a typical headquarters setting. This requirement includes 498,000 square feet (sf) of office/administrative space and 502,000 sf for parking, totaling approximately one million sf. In order to conduct operations prior to the completion of the permanent construction (estimated to be FY25), temporary basing will include 193,000 sf for interim facility space and an estimated 402,000 sf for parking; both will utilize existing infrastructure to the extent possible at the location ultimately selected through the Air Force's basing process.

Site visits have been conducted on Peterson, Schriever, and Buckley Air Force Bases to ascertain potential areas for both the permanent and temporary requirements. Attachment 1 provides maps and information on the potential Areas of Potential Effects (APE) and cultural resources requirements that are known for each of these installations. A combination of archaeological survey and/or historic building evaluation work may be required prior to commencement of permanent construction or temporary occupancy, depending on the installation chosen.

As accurate potential effects to historic properties are not known and cannot be detailed at this time, the Air Force purposes the development of a project-specific Programmatic Agreement (pPA), as allowed for in 36 CFR 800.14(b)(1)(ii) *"when effects on historic properties cannot be fully determined prior to approval of an undertaking."* It is our intent to sign a Finding of No Significant Impact (FONSI) on the EA, if supported by the NEPA evaluation, based on stakeholder concurrence on the pPA, and with the understanding that additional Section 106 consultation will be conducted on the final selected site prior to construction.

In order to solicit comments and afford other parties the opportunity to participate in the development of a pPA, this packet has also been sent to the potential stakeholders listed in Attachment 2, to include the 30 Native American Tribes that currently claim a cultural affiliation to land within Peterson, Schriever, and Buckley Air Force Bases. The stakeholder notification letter is included as Attachment 3. The Advisory Council on Historic Preservation (ACHP) will also be notified of the action and afforded the opportunity to comment or participate as a signatory to the pPA (Attachment 4).

Once comments have been received from other parties, we will work with your office to determine a date and time for a meeting to formally begin the pPA development process. The points of contact for this matter are Mr. Russell Perry, Environmental Program Manager, Headquarters Air Force Space Command, [redacted] and Ms. Pamela Miller, Cultural Resources Media Manager, Air Force Civil Engineer Center, [redacted]. Thank you for your time and consideration in this matter.

Sincerely,

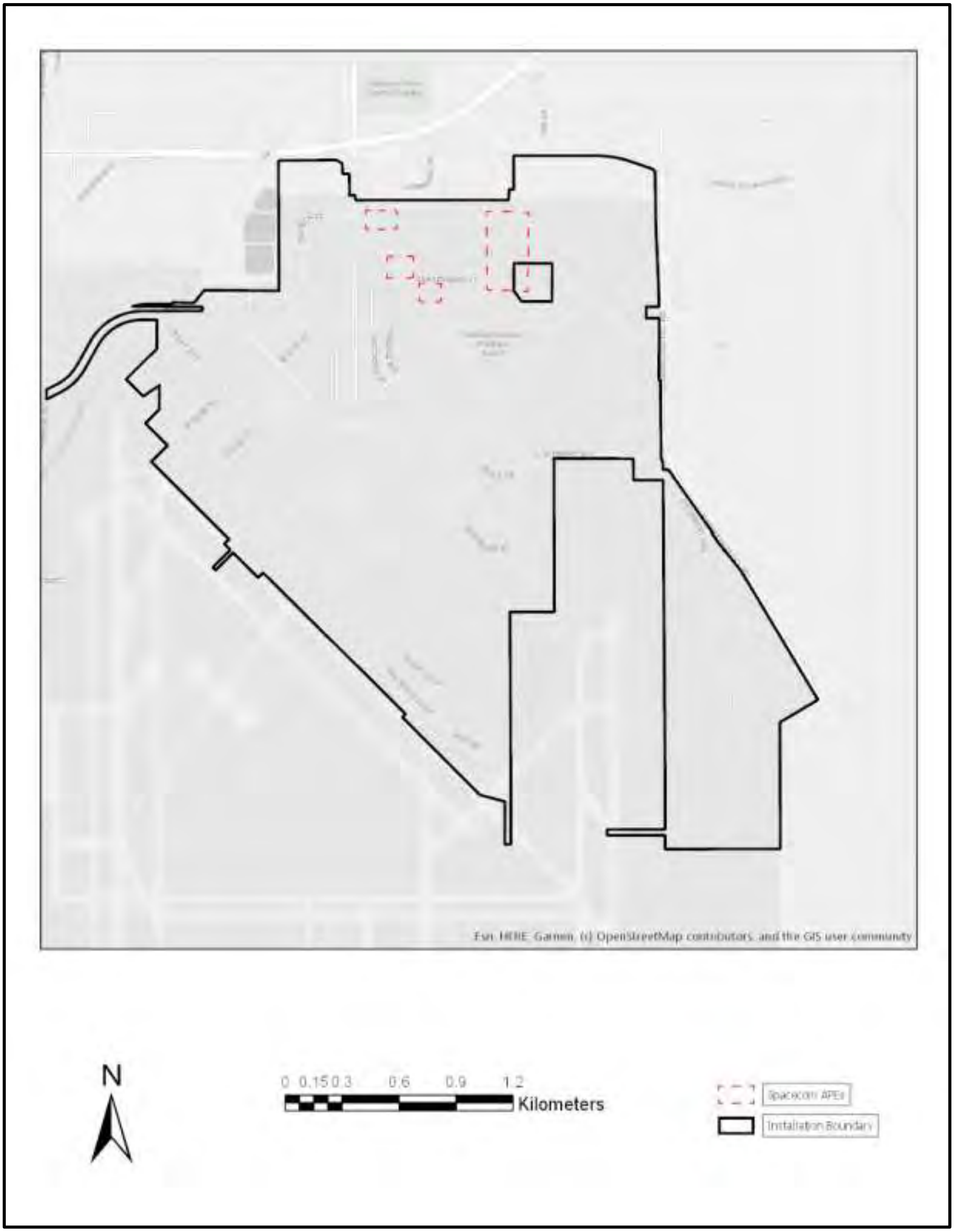
MICHELLE A. LINN, GS-15, DAF
Chief, Civil Engineer Division
Command Civil Engineer

4 Attachments:
1. APE Maps and details for Peterson, Schriever, and Buckley Air Force Bases
2. Stakeholder and Tribal Partner List
3. Consultation Letter to Other Stakeholders
4. Invitation and Notification Letter to ACHP

ATTACHMENT 1

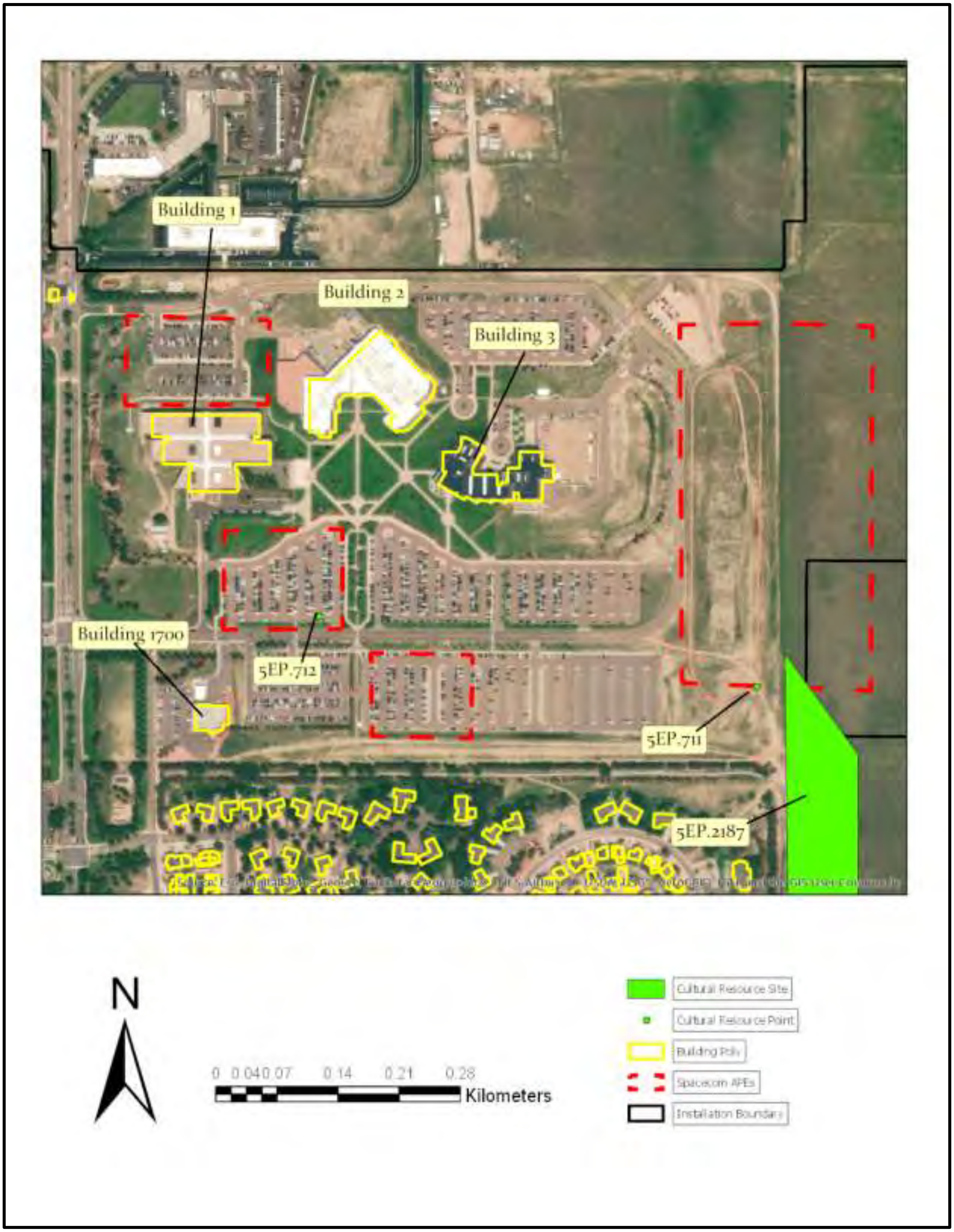
A. Peterson Air Force Base (PAFB) Option
B. Buckley Air Force Base (BAFB) Option
C. Schriever Air Force Base (SAFB) Option

A. PAFB Option



Map Showing SPACECOM APEs and PAFB Boundary

Map Showing SPACECOM APEs and Cultural Resources



Map Showing SPACECOM APEs and Cultural Resources

Future Cultural Resource Considerations for PAFB Option

Buildings:

1) Building 1 – 5EP.8209 was recommended not NRHP-eligible by Mead and Hunt (2018) under Criteria Consideration G for evaluation within the Cold War-era.
2) Building 2 – Constructed in 2002 and has not been evaluated for significance under Criterion Consideration G; outside the established Cold War-era context.
3) Building 3 – Constructed in 2002 and has not been evaluated for significance under Criterion Consideration G; outside the established Cold War-era context.
4) Building 1700 – 5EP.8272 was recommended not NRHP-eligible by Mead and Hunt (2018) under Criteria Consideration G for evaluation within the Cold War-era.

Archaeology:

1) 5EP.711 – Isolated chalcedony flake recommended not NRHP-eligible (1984).
2) 5EP.712 – Isolated chert scraper recommended not NRHP-eligible (1984).
3) 5EP.2178 – Historical erosion control ditches are officially not NRHP-eligible (1994).

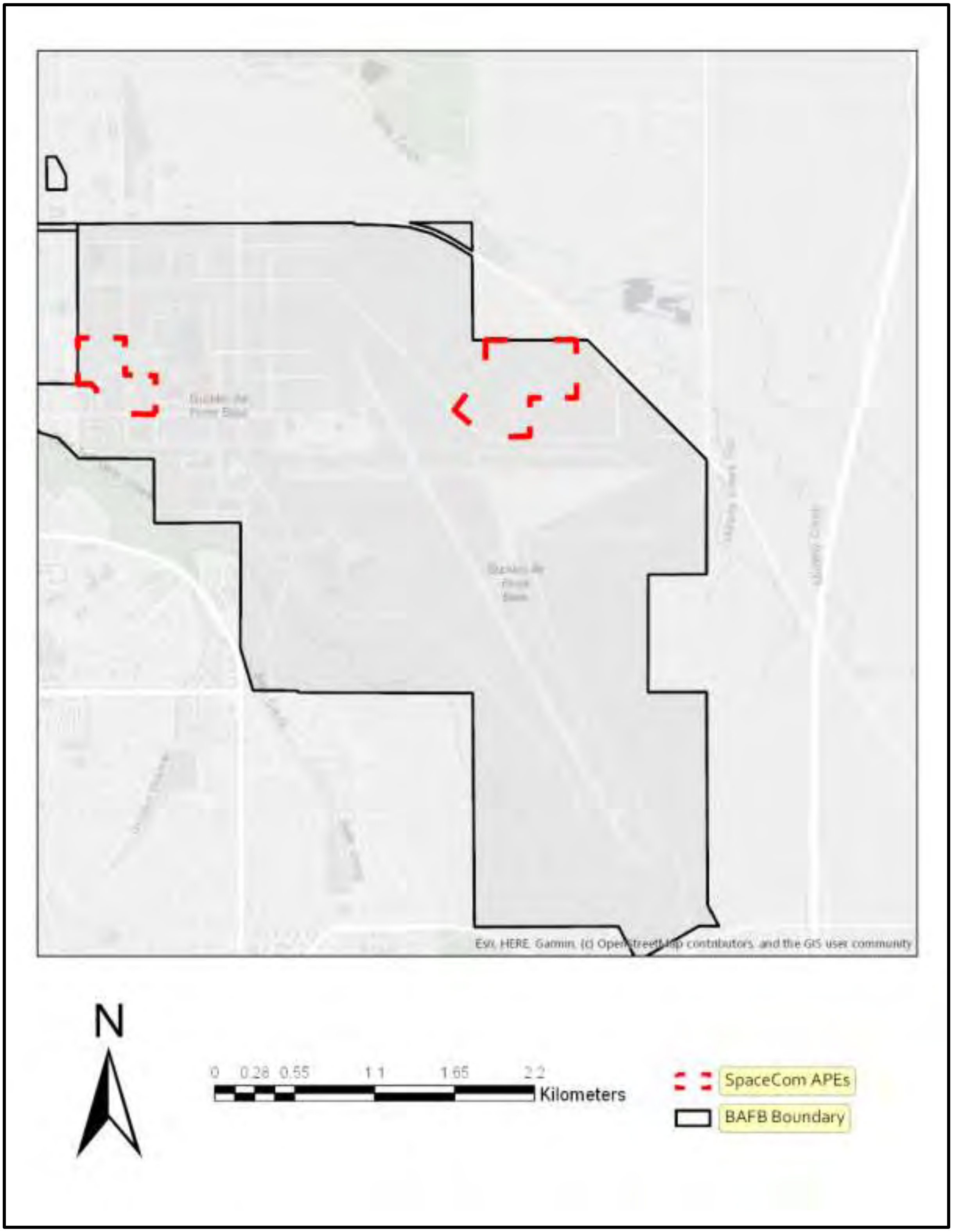
Survey:

1) All four APEs were surveyed by Larson-Tibesar Associates (Hillman and Tibesar 1984).
2) East half of easternmost APE surveyed by Geo-Marine Inc. (Hughes et al. 2010).

Summation:

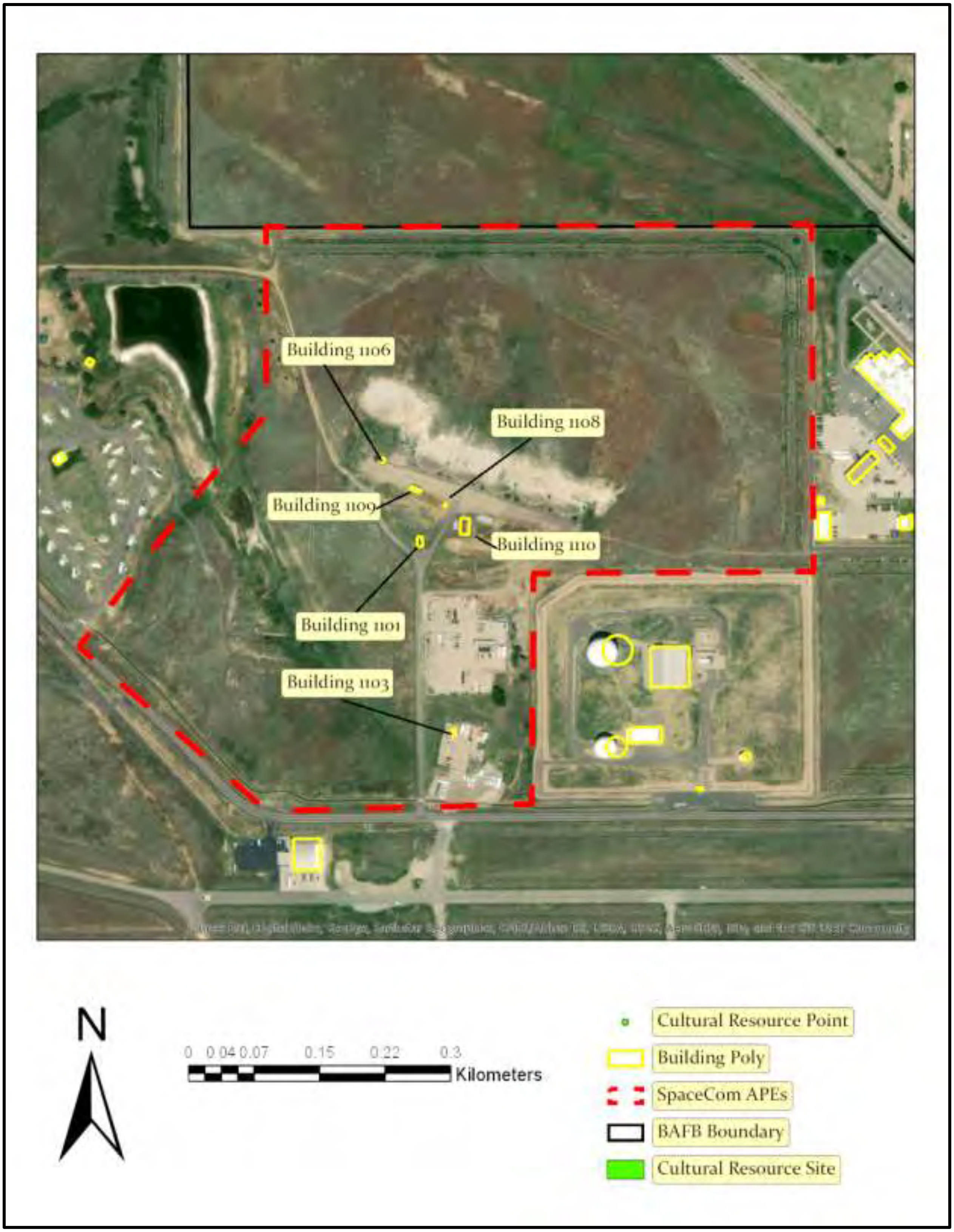
1) No buildings evaluation work anticipated.
2) Site 5EP.2178 will need to be assessed for re-evaluation.
3) West half of the easternmost APE (n=12 acres) will need to be re-surveyed. Though other APEs were surveyed by Hillman and Tibesar (1984), all now exist as man-made landscapes (parking lots, buildings, roads).

B. BAFB Option



Map Showing SPACECOM APEs and BAFB Boundary

Map Showing West SPACECOM APE and Cultural Resources



Map Showing East SPACECOM APE and Cultural Resources

Future Cultural Resource Considerations for BAFB Option

Buildings:

1) Building 200 – 5AH.2284 was officially not NRHP-eligible (2004); subsequently demolished.
2) Building 202 – Constructed in 1995 and has not been evaluated for Cold War-era significance under Criteria Consideration G.
3) Building 210 – Constructed in 2000 and has not been evaluated for Cold War-era significance under Criterion Consideration G. However, building is a Canine Kennel and would hold no significance within Cold War criteria.
4) Building 444 – Radome constructed in 1999, has not been evaluated under Criterion Consideration G for Cold War-era significance or within its continuing role in the nation's defense.
5) Building 445 – Radome constructed in 2001, has not been evaluated under Criterion Consideration G for Cold War-era significance or within its continuing role in the nation's defense.
6) Building 446 – Constructed in 1999, generator pad has not yet been evaluated; outside the established Cold War-era context.
7) Building 1101 – 5AH.2277 is officially not NRHP-eligible (Peyton 2004).
8) Building 1103 – Constructed in 1977, pump station has not yet been evaluated; supplemental structure not connected to Cold War-era activities.
9) Building 1106 – Constructed in 1999, this small pavilion has not yet been evaluated; outside the established Cold War-era context.
10) Building 1108 – Skeet High House constructed in 1968; not NRHP-eligible (Peyton 2004).
11) Building 1109 – Skeet High House constructed in 1968; not NRHP-eligible (Peyton 2004).
12) Building 1110 – Club House constructed in 1986; not NRHP-eligible (Peyton 2004).
13) Building 12407 – This 1987 jet fuel storage tank has been demolished.
14) Building 12417 – This 1987 jet fuel storage tank has been demolished.

Archaeology:

1) 5AH.535 – Historic Cantonment Area is officially not NRHP-eligible (Powers Elevation 1990).

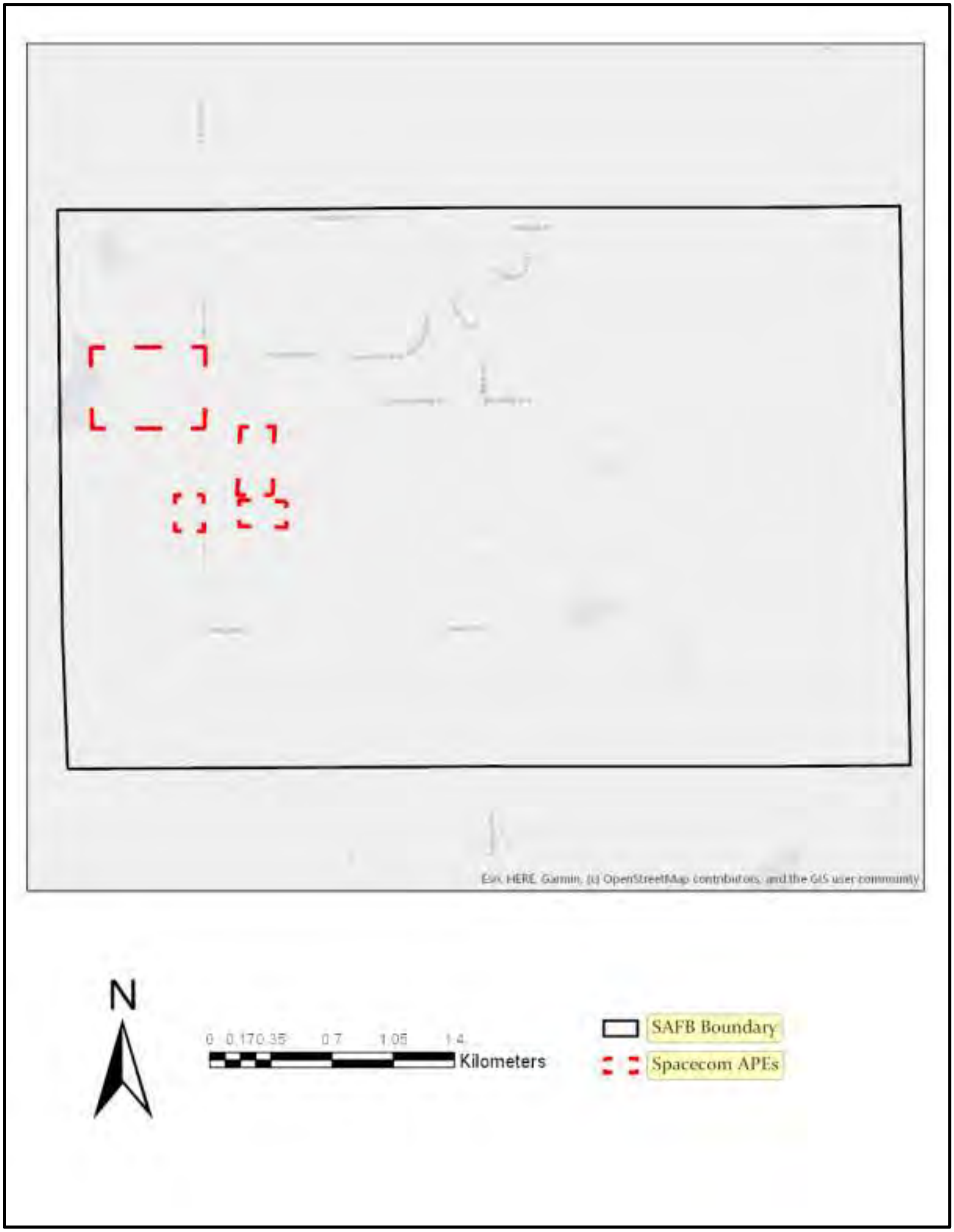
Survey:

1) West APE = 40 acres
2) East APE = 93 acres

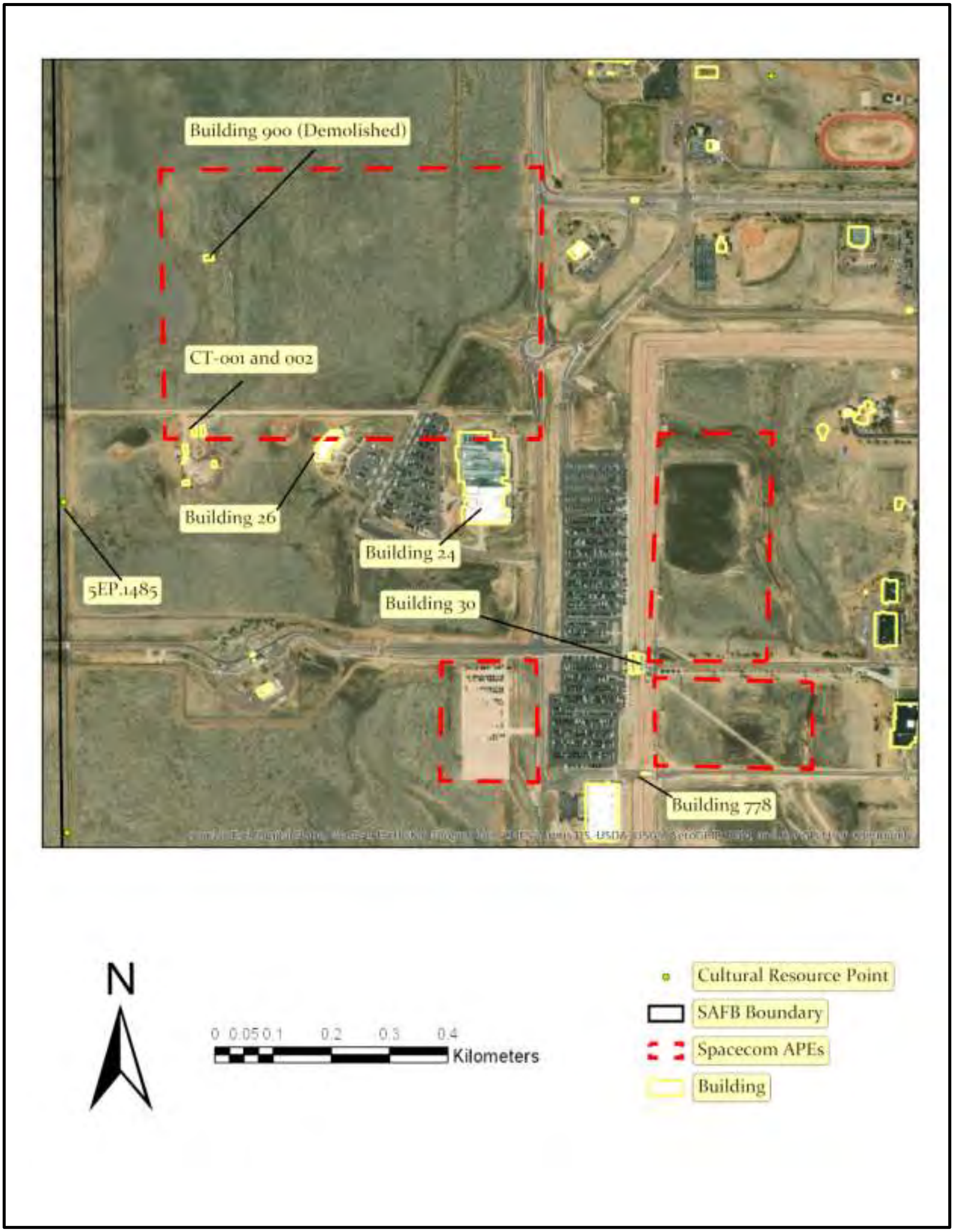
Summation:

1) Two small radomes will need to be evaluated under Criteria Consideration G.
2) Anticipate no archaeological work; depends on current survey.
3) Anticipate 133 acres to survey.

C. SAFB Option



Map Showing SPACECOM APEs and SAFB Boundary



Map Showing SPACECOM APEs and Cultural Resources

Future Cultural Resource Considerations for SAFB Option

Buildings:

1) Building 24 - Constructed in 2009 and has not yet been evaluated; outside the established Cold War-era context.
2) Building 26 - Constructed in 2011 and has not yet been evaluated; outside the established Cold War-era context.
3) Building 30 - Constructed in 1992 and has not yet been evaluated; outside the established Cold War-era context.
4) Building 778 - Constructed in 1992 and has not yet been evaluated; outside the established Cold War-era context.
5) Building 900 has been demolished.
6) CT-001 and CT-002 are temporary trailers; no evaluation necessary.

Archaeology:

1) N/A – there are no previously recorded archaeological sites or features within 200 meters of an APE.

Survey:

1) 110 acres that will require archaeological inventory.

Summation:

1) No buildings evaluation work.
2) No archaeological site or feature re-evaluation work.
3) 110 acres to be inventoried.

ATTACHMENT 2

Stakeholders:

PAFB/SAFB:
City of Colorado Springs
El Paso County Commissioners

BAFB:
City of Aurora
Colorado Department of Transportation
Arapahoe County Commissioners
Plains Conservation Center

Affiliated Native American Tribes:

Apache Tribe of Oklahoma
Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation
Cheyenne and Arapaho Tribes of Oklahoma
Cheyenne River Sioux Tribe
Comanche Nation of Oklahoma
Crow Nation
Eastern Shoshone Tribe of Wind River Reservation
Flandreau Santee Sioux Tribe of South Dakota
Fort Belknap Indian Community
Fort Sill Apache Tribe
Jicarilla Apache Tribe
Kiowa Tribe of Oklahoma
Lower Brule Sioux Tribe of the Lower Brule Reservation, SD
Mescalero Apache Tribe
Northern Arapaho Tribe
Northern Cheyenne Tribe
Oglala Sioux Tribe
Pawnee Nation of Oklahoma
Pueblo of Taos
Pueblo of Zuni
Rosebud Sioux Tribe
Santee Sioux Nation
Southern Ute Indian Tribe
Spirit Lake Nation
Standing Rock Sioux Tribe
Three Affiliated Tribes of the Mandan, Hidatsa & Arikara Nation
Upper Sioux Indian Community
Ute Indian Tribe of the Uintah & Ouray Reservation
Ute Mountain Ute Tribe
Yankton Sioux Tribe

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE SPACE COMMAND

3 June 2019

Ms. Michelle Linn
Headquarters Air Force Space Command Civil Engineer
[redacted]

Dear Stakeholder and Tribal Partner

This letter serves to initiate consultation in accordance with Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 306108, regarding an action being analyzed in a National Environmental Policy Act (NEPA) Environmental Assessment (EA). The Air Force is proposing to establish a permanent United States Space Command (USSPACECOM) headquarters at one of six military installations located within the United States.

Section 1601(c) of the Fiscal Year 18 (FY18) National Defense Authorization Act (NDAA) directed the Deputy Secretary of Defense (DepSecDef) to review national security space DoD components and make recommendations to Congress by August 1, 2018. The DepSecDef's final report recommended that the President of the United States modify the Unified Command Plan (UCP) to stand up a new combatant command for space, USSPACECOM. As such, a permanent headquarters must be established in order to meet full operational capability requirements. Three of the potential locations being analyzed in the EA are within Colorado: Peterson Air Force Base, Schriever Air Force Base, and Buckley Air Force Base. The Cheyenne Mountain Air Force Station had been under consideration as well, but has been eliminated from the NEPA analysis.

It is currently estimated that USSPACECOM will require permanent facility construction to accommodate approximately 1,861 personnel in a typical headquarters setting. This requirement includes 498,000 square feet (sf) of office/administrative space and 502,000 sf for parking, totaling approximately one million sf. In order to conduct operations prior to the completion of the permanent construction (estimated to be FY25), temporary basing will include 193,000 sf for interim facility space and an estimated 402,000 sf for parking; both will utilize existing infrastructure to the extent possible at the location ultimately selected through the Air Force's basing process.

Site visits have been conducted on Peterson, Schriever, and Buckley Air Force Bases to ascertain potential areas for both the permanent and temporary requirements. Attachment 1 provides maps and information on the potential Areas of Potential Effects (APE) and cultural resources requirements that are known for each of these installations. A combination of archaeological survey and/or historic building evaluation work may be required prior to commencement of permanent construction or temporary occupancy, depending on the installation chosen.

As accurate potential effects to historic properties are not known and cannot be detailed at this time, the Air Force purposes the development of a project-specific Programmatic Agreement (pPA), as allowed for in 36 CFR 800.14(b)(1)(ii) *"when effects on historic properties cannot be fully determined prior to approval of an undertaking."* It is our intent to sign a Finding of No Significant Impact (FONSI) on the EA, if supported by the NEPA evaluation, based on stakeholder concurrence on the pPA, and with the understanding that additional Section 106 consultation will be conducted on the final selected site prior to construction.

This letter has been sent to the COSHPO and potential stakeholders listed in Attachment 2, to include the 30 Native American Tribes that currently claim a cultural affiliation to lands within Peterson, Schriever, and Buckley Air Force Bases. The intent at this juncture is to solicit comments and afford you the opportunity to participate in the development of a pPA as a concurring party.

The points of contact for this matter are Mr. Russell Perry, Environmental Program Manager, Headquarters Air Force Space Command [redacted] and Ms. Pamela Miller, Cultural Resources Media Manager, Air Force Civil Engineer Center, [redacted] Please respond as indicated below to either Mr. Perry or Ms. Miller with any [redacted] well as your desire to participate in the development of a pPA. Responses can be submitted through formal letter or email, both of which will be recorded in the administrative record equally. We respectfully request your response no later than 45 days after receipt of this packet. Thank you for your time and consideration in this matter.

Response Information:
Please address written correspondence to:
Mr. Russell Perry
[redacted]

Please forward email responses to:
Mr. Russell Perry, [redacted]
Ms. Pamela Miller [redacted]

Sincerely

MICHELLE A. LINN, GS-15, DAFC
Chief, Civil Engineer Division
Command Civil Engineer

2 Attachments:
1. APE Maps and details for Peterson, Schriever, and Buckley Air Force Bases
2. Stakeholder and Tribal Partner List

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE SPACE COMMAND

3 June 2019

Ms. Michelle Linn
Headquarters Air Force Space Command Civil Engineer
[redacted]

Ms. Katharine Kerr, Historic Preservation Specialist
Advisory Council on Historic Preservation
[redacted]

Dear Ms. Kerr

This letter serves to initiate consultation in accordance with Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 306108, regarding an action being analyzed in a National Environmental Policy Act (NEPA) Environmental Assessment (EA). The Air Force is proposing to establish a permanent United States Space Command (USSPACECOM) headquarters at one of six military installations located within the United States.

Section 1601(c) of the Fiscal Year 18 (FY18) National Defense Authorization Act (NDAA) directed the Deputy Secretary of Defense (DepSecDef) to review national security space DoD components and make recommendations to Congress by August 1, 2018. The DepSecDef's final report recommended that the President of the United States modify the Unified Command Plan (UCP) to stand up a new combatant command for space, USSPACECOM. As such, a permanent headquarters must be established in order to meet full operational capability requirements. Three of the potential locations being analyzed in the EA are within Colorado: Peterson Air Force Base, Schriever Air Force Base, and Buckley Air Force Base. The Cheyenne Mountain Air Force Station had been under consideration as well, but has been eliminated from the NEPA analysis.

It is currently estimated that USSPACECOM will require permanent facility construction to accommodate approximately 1,861 personnel in a typical headquarters setting. This requirement includes 498,000 square feet (sf) of office/administrative space and 502,000 sf for parking, totaling approximately one million sf. In order to conduct operations prior to the completion of the permanent construction (estimated to be FY25), temporary basing will include 193,000 sf for interim facility space and an estimated 402,000 sf for parking; both will utilize existing infrastructure to the extent possible at the location ultimately selected through the Air Force's basing process.

Site visits have been conducted on Peterson, Schriever, and Buckley Air Force Bases to ascertain potential areas for both the permanent and temporary requirements. Attachment 1 provides maps and information on the potential Areas of Potential Effects (APE) and cultural resources requirements that are known for each of these installations. A combination of archaeological survey and/or historic building evaluation work may be required prior to commencement of permanent construction or temporary occupancy, depending on the installation chosen.

As accurate potential effects to historic properties are not known and cannot be detailed at this time, the Air Force purposes the development of a project-specific Programmatic Agreement (pPA), as allowed for in 36 CFR 800.14(b)(1)(ii) *"when effects on historic properties cannot be fully determined prior to approval of an undertaking."* It is our intent to sign a Finding of No Significant Impact (FONSI) on the EA, if supported by the NEPA evaluation, based on stakeholder concurrence on the pPA, and with the understanding that additional Section 106 consultation will be conducted on the final selected site prior to construction.

In order to solicit comments and afford all parties the opportunity to participate in the development of a pPA, this packet has also been sent to the potential stakeholders listed in Attachment 2, to include the 30 Native American Tribes that currently claim a cultural affiliation to lands within Peterson, Schriever, and Buckley Air Force Bases. The initial COSHPO and stakeholder consultation letters are included as Attachment 3.

The points of contact for this matter are Mr. Russell Perry, Environmental Program Manager, Headquarters Air Force Space Command, [redacted] and Ms. Pamela Miller, Cultural Resources Media Manager, Air Force Civil Engineer Center, [redacted] Thank you for your time and consideration in this matter.

Sincerely

MICHELLE A. LINN, GS-15, DAFC
Chief, Civil Engineer Division
Command Civil Engineer

3 Attachments:
1. APE Maps and details for Peterson, Schriever, and Buckley Air Force Bases
2. Stakeholder and Tribal Partner List
3. Consultation Letters to COSHPO and Other Stakeholders

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

Christopher Ryan
30 CES/CEIEA
[redacted]

29 August 2019

Mr. Freddie Romero
Santa Ynez Band of Chumash Indians
[redacted]

Dear Freddie

The United States Air Force (USAF) proposes Vandenberg Air Force Base (VAFB) as one of five alternative locations where headquarters for the newly-established U.S. Space Command would be constructed. Four other Department of Defense installations also are being considered: Buckley AFB, Peterson AFB, and Schriever AFB in Colorado; and the U.S. Army Garrison Redstone Arsenal in Alabama. For the VAFB alternative, one interim site alternative (three separate existing facilities) and one 23-acre permanent site alternative (proposed new construction) were identified to support this headquarters basing initiative, both of which are in the cantonment area on North VAFB, in Santa Barbara County, California. The project alternative located at Vandenberg AFB is an undertaking subject to compliance with Section 106 (codified at 54 USC 306108) of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101 et seq.: Historic Preservation). For the VAFB alternative only, VAFB will comply with Section 106 using the implementing regulations (36 CFR Part 800) and is hereby initiating consultation with the Santa Ynez Band of Chumash Indians (Tribe).

VAFB carried out a reasonable and good-faith investigation that fulfills federal agency responsibilities pursuant to 36 CFR 800.4(a)-(d). The area of potential effects (APE) is made up of four discontiguous activity areas: the 23-acre permanent site alternative plus three facilities that comprise the interim site alternative (Facilities 6523, 7525, and 10577). No cultural resources exist within the boundaries of the Permanent Site Alternative. The three facilities comprising the Interim Site Alternative are included in the APE due to proposed renovations at each of the three buildings. Facilities 6523, 7525, and 10577 were recorded and evaluated for NRHP-eligibility for the first time during this study. None of these three buildings meets the criteria for NRHP-eligibility. No other cultural resources exist within or immediately adjacent to the Project APE, and the APE has a low archaeological sensitivity. Details of the investigation are provided in the attachment. The Department of Parks and Recreation forms recording the buildings have been omitted from the Tribe's copy of the report.

In summary, VAFB has reached a Section 106 finding of *no historic properties affected* for this undertaking. The Base recognizes that the Santa Ynez Band of Chumash Indians may have concerns beyond the purview of the National Historic Preservation Act. Therefore, I am seeking any additional comments or concerns you may have about cultural resources. I would appreciate receiving any feedback as part of this consultation within the next 30 calendar days. Please feel free to let me know if you require additional time. I can be reached at [redacted] or via email at [redacted] Thank you for your assistance with this undertaking.

Sincerely

CHRISTOPHER RYAN
Installation Tribal Liaison Officer

Attachment:
Identification of Historic Properties, U.S. Space Command Headquarters Basing and Construction Project

**PROGRAMMATIC AGREEMENT AMONG
THE UNITED STATES AIR FORCE AND THE
COLORADO STATE HISTORIC PRESERVATION OFFICER
REGARDING
UNITED STATES SPACE COMMAND
HEADQUARTERS BASING AND CONSTRUCTION
AT A SELECTED BASE IN COLORADO**

THIS PROGRAMMATIC AGREEMENT (hereinafter the "Agreement") is made and entered into by and between the United States Air Force (hereinafter "USAF"), including the Commanders of Buckley, Peterson, and Schriever Air Force Bases, and the Colorado State Historic Preservation Officer (hereinafter "SHPO") (referred to hereinafter as the "Signatories"); and

WHEREAS, Section 1601(c) of the Fiscal Year 18 (FY18) National Defense Authorization Act (NDAA) directed the Deputy Secretary of Defense (DepSecDef) to review national security space Department of Defense (DoD) components and make recommendations to Congress by August 1, 2018. The DepSecDef's final report recommended that the President of the United States modify the Unified Command Plan (UCP) to stand up a new combatant command for space. The U.S. Strategic Command's (USSTRATCOM) Joint Force Space Component Command (JFSCC) was elevated to a combatant command and assumed these duties in 2019; and

WHEREAS, in accordance with the National Environmental Policy Act (NEPA, 42 United States Code (USC) 4321 et seq) the USAF has initiated analysis in an *Environmental Assessment for United States Space Command (USSPACECOM) Headquarters Basing and Construction* (USSPACECOM EA) to establish a permanent United States Space Command headquarters at one of five military installations located within the United States; and

WHEREAS, a permanent headquarters must be established in order to meet full operational capability requirements, and three of the potential locations undergoing NEPA analysis in the USSPACECOM EA are within Colorado: Peterson Air Force Base, Schriever Air Force Base, and Buckley Air Force Base (referred to hereinafter as "Selected Base"); and

WHEREAS, pursuant to 36 Code of Federal Regulations (CFR) § 800.16(y), the USSPACECOM operational capability requirements constitute a federal undertaking (hereinafter the "Project") subject to the requirements of Section 106 of the National Historic Preservation Act (NHPA, 54 USC 306108), and its implementing regulations at 36 CFR Part 800; and

WHEREAS, the USAF initiated consultation in accordance with Section 106 on May 29, 2019, with the SHPO, the Advisory Council on Historic Preservation (ACHP), 30 Federally-recognized Native American Tribes, and other stakeholders (Appendix A) regarding this basing action, and invited them to participate in consultation and development of this Agreement; and

WHEREAS, the Selected Base will require permanent facility construction to accommodate personnel in office/administrative space and parking, as well as the identification of infrastructure for interim facility requirements prior to and during permanent construction; and

WHEREAS, site visits have been conducted on Peterson, Schriever, and Buckley Air Force Bases to ascertain potential areas for both the permanent and temporary basing requirements, and a combination of archaeological survey and/or historic building evaluation work may be required on the Selected Base; and

WHEREAS, in accordance with 36 CFR § 800.14(b)(1)(ii), execution of a Programmatic Agreement (PA) is appropriate because effects on historic properties from Project activities cannot be fully determined until the NEPA process is finalized, a permanent installation has been chosen, and the USAF has approved the undertaking; and

WHEREAS, it is the USAF's intent to sign a Finding of No Significant Impact (FONSI) on the USSPACECOM EA, if supported by the NEPA evaluation, based on development and implementation of this Agreement, and with the understanding that additional Section 106 consultation will be conducted on the Selected Base prior to the initiation of the temporary basing actions and permanent construction; and

WHEREAS, the ACHP notified the USAF on June 24, 2019, that their participation in the development of this Agreement is premature, but should, through continued consultation, the USAF determine that a finding of adverse effect to historic properties is appropriate, the USAF must notify the ACHP of said finding and provide the documentation detailed in 36 CFR § 800.11(e); and

WHEREAS, the City of Aurora, Historic Sites and Preservation Office; the City of Colorado Springs, Land Use Review Division, Planning and Community Development Office; the Three Affiliated Tribes of the Mandan, Hidatsa & Arikara Nation; the Southern Ute Indian Tribe; and the Rosebud Sioux Tribe have notified the USAF of their intention to participate in the development of this Agreement and sign as Concurring Parties (combined with Signatories, hereinafter "Consulting Parties" where appropriate); and

WHEREAS, the definitions set forth in 36 CFR § 800.16 are incorporated herein by reference and apply throughout this Agreement.

NOW, THEREFORE, the Consulting Parties agree that, upon the decision to proceed with the undertaking at the Selected Base, the following stipulations will be implemented in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

The USAF Commander of the Selected Base shall ensure that the following measures are carried out:

I. RESPONSIBILITIES

A. The Commander of the Selected Base is responsible for ensuring that all historic properties on the Selected Base are identified, evaluated, and taken into account during the continuing consultation process in accordance with the NHPA for compliance with Section 106 of that Act.

B. The Commander of the Selected Base shall ensure that the Air Force Civil Engineer Center (AFCEC), Midwest Region Peterson Section Installation Support (ISS), Cultural

Resources Media Manager (CRMM), is included in all aspects of Project planning and compliance with Section 106.

C. The Commander of the Selected Base shall ensure that a Cultural Resources Manager (CRM) has been designated with the authority to implement the stipulations identified in this Agreement. The CRM should meet the professional qualification standards outlined in the *Secretary of the Interior's (SOI) Standards and Guidelines for Archaeology and Historic Preservation* Professional Qualification Standards in Archaeology, History, Architecture, Architectural History, or Historic Architecture (48 FR 44738 - 44739).

D. The AFCEC CRMM will provide oversight of the Section 106 process, if necessary, to ensure that the SOI professional qualification standards are met on the Selected Base. These standards will also apply to any work performed by contracted personnel for archaeological surveys and historic buildings inventories.

E. AFCEC will assist the Commander of the Selected Base with cultural resources and Section 106 technical and compliance expertise for the Project, to include assistance in development and/or review of additional agreement documents as needed (AFI 32-7065, Chapter 2, Section 2.8).

F. In accordance with Section 101(b)(3) of the NHPA, the SHPO shall advise and assist the Selected Base in carrying out their Section 106 responsibilities and shall work with the USAF, other Federal agencies if appropriate, Native American Tribes with a cultural interest in the Project area, local governments, and other organizations and individuals to ensure that historic properties are taken into consideration at all levels of planning and development (36 CFR § 800.2(c)(1)(i)).

II. PROJECT DEVELOPMENT AND IMPLEMENTATION

A. Known Project specifications: It is estimated that USSPACECOM will require permanent facility construction to accommodate approximately 1,870 personnel in a typical headquarters setting. This requirement includes 498,000 square feet (sf) of office/administrative space and 502,000 sf for parking, totaling approximately one million sf. In order to conduct operations prior to the completion of the permanent construction (estimated to be FY25), temporary basing will include 193,000 sf for interim facility space and an estimated 402,000 sf for parking; both will utilize existing infrastructure to the extent possible at the Selected Base.

B. The initial project specifications were reviewed for each of the Selected Bases in both the USSPACECOM EA and the initial Section 106 consultation information sent to all Stakeholders.

C. Each phase of the Project and all design, construction, development, operation, maintenance, repair, replacement, and management of the project area must undergo assessment by the Selected Base CRM for adverse effects to identified historic properties in accordance with 36 CFR § 800.5, and have any adverse effects resolved in accordance with 36 CFR § 800.6.

D. A Categorical Exclusion (CATEX) under NEPA does not exclude the action/project from compliance review under Section 106.

E. As the Project includes temporary basing actions, and construction of permanent facilities may be phased, multiple consultations on potential affects and their avoidance, minimization, and/or mitigation may be occurring simultaneously.

F. Each base under consideration has an Integrated Cultural Resources Management Plan (ICRMP), with standardized language across the USAF for NHPA and other environmental compliance actions. Chapter 7 of the ICRMP contains a number of Standard Operating Procedures (SOP) for management and compliance of cultural resources, attached to this Agreement as Appendix B. The following SOPs are detailed in each ICRMP, and as such, will apply to the Selected Base without exception:

1) 7.1 Communication, Planning, and Environmental Impact Analysis Plan

2) 7.2 36 CFR Part 800 Process (Implementing NHPA Section 106)

3) 7.3 Cultural Resources Contracting

4) 7.4 Discoveries of Archaeological Resources and Native American Graves Protection and Repatriation Act (NAGPRA) Cultural Items

5) 7.5 Native American Access

6) 7.6 Accidents and Emergencies Affecting Historic Properties

7) 7.7 Suspected Vandalism

8) 7.8 Curation of Collections and Records

9) 7.9 Management and Coordination

G. The Selected Base will ensure that Native American topics of concern are fully addressed during the consultation in accordance with Sections 110 and 106 of the NHPA for the Project, i.e. identification of properties of traditional, cultural, and/or religious significance, monitoring, level of engagement, etc.

III. MONITORING AND REPORTING

A. The Selected Base will ensure that all planning, design, and construction phases of the Project are coordinated with the Base CRM and the AFCEC CRMM, and that personnel conducting monitoring activities meet the Secretary of the Interior's Professional Qualifications (48 FR 44738 - 44739) as an Archaeologist and/or Architectural Historian, as appropriate. The Selected Base will also ensure that monitoring by Native American Tribal Cultural Specialists is accommodated, as agreed upon during the Section 106 consultation process.

B. Within 15 days of the end of each fiscal quarter after the execution of this Agreement, the Selected Base CRM will submit a written report to the CRMM and all Consulting Parties that describes the following:

1) results and progress of continuing Section 106 consultation, as applicable;

2) monitoring and inspection activities;

3) status of additional archaeological surveys and/or buildings evaluations;

4) development of construction plans and specifications;

5) construction completed during the period covered by the report;

6) treatment of any post-review discoveries pursuant to Stipulation II F(4) of this Agreement;

7) proposed scheduling changes;

8) problems encountered and of relevance to this Agreement; and

9) disputes addressed pursuant to Stipulation V of this Agreement, if applicable.

This report will be submitted electronically to all Parties. With quarterly reporting, this Agreement will not require an annual report. If report comments are received from any of the Consulting Parties, the Selected Base CRM will incorporate the comments into the next quarterly report.

IV. CONFIDENTIALITY

A. The USAF and Consulting Parties acknowledge that some historic properties that may be covered by this Agreement are subject to the provisions of Section 304 of the NHPA (54 USC § 307103) and 36 CFR § 800.11(c), relating to the disclosure of sensitive information on historic properties and, will ensure to the extent permitted by law, the confidentiality regarding the character and location of historic properties involved in the implementation of this Agreement.

V. DISPUTE RESOLUTION

A. Should any of the Signatories to this Agreement object in writing at any time to actions proposed or the manner in which the terms of this Agreement are implemented, the USAF will consult with that Signatory to resolve the objection. If the USAF determines that the objection cannot be resolved, USAF will:

1. Forward all documentation relevant to the dispute, including the resolution proposed by the USAF, to the ACHP. The ACHP shall provide the USAF with its advice, pursuant to 36 CFR § 800.2(b)(2), on the resolution of the objection within thirty (30) calendar days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the USAF shall prepare a written response that considers any timely advice or comments regarding the dispute from the ACHP and Consulting Parties, and provide them with a copy of the written response. The USAF will then proceed according to its final decision.

2. USAF responsibilities to carry out all other actions subject to the terms of this Agreement that are not the subject of the dispute remain unchanged.

VI. TERM OF AGREEMENT

A. The term of this Agreement shall be ten (10) years from the date of execution by the Signatories, or until it has been shown and agreed upon by the Signatories that all Project actions have been completed in a satisfactory manner and all Stipulations of the Agreement have been met.

VII. AMENDMENT

A. This Agreement may be amended when such an amendment has been agreed to in writing by all Signatories. The amendment will be effective on the date it is executed by the Signatories and filed with ACHP.

VIII. TERMINATION

A. If any of the Signatories to this Agreement determine that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to this Agreement to attempt to develop an amendment per Stipulation VII. If, within thirty (30) calendar days (or another time period agreed to by all Signatories), an amendment cannot be reached, any Signatory may terminate the Agreement upon written notification to the other Signatories.

B. Once the Agreement is terminated, for the Project development to continue in compliance with Section 106 of the NHPA, the USAF and other Consulting Parties to this Agreement must do either of the following:

1. Execute an agreement pursuant to 36 CFR § 800.6; or
2. Request, consider, and respond to the comments of ACHP under 36 CFR § 800.7.

IX. EXECUTION

Execution of this Agreement by the USAF and the Signatories, submission of the Agreement to the ACHP in accordance with 36 CFR § 800.6(b)(1)(iv), and implementation of its terms is evidence that the USAF has taken into account the effects of the undertaking on historic properties and afforded the ACHP an opportunity to comment.

X. EFFECTIVE DATE

This Agreement will take effect when executed by all Signatories.

**PROGRAMMATIC AGREEMENT AMONG
THE UNITED STATES AIR FORCE AND THE
COLORADO STATE HISTORIC PRESERVATION OFFICER
REGARDING
UNITED STATES SPACE COMMAND
HEADQUARTERS BASING AND CONSTRUCTION
AT A SELECTED BASE IN COLORADO**

Signatories:

UNITED STATES AIR FORCE

By: LINN.MICHELLE.A.1049506003 Digitally signed by LINN.MICHELLE.A.1049506003 Date: 2019.08.16 14:06:01 -06'00' Date: 08/16/19

MICHELLE A. LINN, GS-15, DAFC
Chief, Civil Engineer Division
Air Force Space Command

By: SMITH.JAMES.E.1152602835 Digitally signed by SMITH.JAMES.E.1152602835 Date: 2019.08.22 16:37:29 -06'00' Date: 8/22/19

JAMES E. SMITH, COL, USAF
Commander, Schriever Air Force Base

By: PEPPER.DEVIN.R.1092305356 Digitally signed by PEPPER.DEVIN.R.1092305356 Date: 2019.08.23 14:30:32 -06'00' Date: 8/23/19

DEVIN R. PEPPER, COL, USAF
Commander, Buckley Air Force Base

By: FALZARANO.THOMAS.GEORGE.1009836418 Digitally signed by FALZARANO.THOMAS.GEORGE.1009836418 Date: 2019.08.21 11:00:09 -06'00' Date: 8/21/19

THOMAS G. FALZARANO, COL, USAF
Commander, Peterson Air Force Base

COLORADO STATE HISTORIC PRESERVATION OFFICE

By: Dr. Holly K. Norton Date: 8/28/19

for ~~STEVE TURNER, AIA~~
Colorado State Historic Preservation Officer

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Concurring Party:

CITY OF AURORA, HISTORIC SITES AND PRESERVATION OFFICE

By: ______________________ Date: 04 SEP 2019

Name: DRAKE BROWNFIELD

Title: HISTORIC PRESERVATION SPECIALIST

Contact Information:

Email: DBROWNFI@AURORAGOV.ORG

Phone: [redacted]

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Concurring Party:

CITY OF COLORADO SPRINGS, LAND USE REVIEW DIVISION, PLANNING & COMMUNITY DEVELOPMENT OFFICE

By: ______________________ Date: 9.10.2019

Name: PETER WYSOCKI

Title: DIRECTOR OF PLANNING & COMMUNITY DEVELOPMENT

Contact Information:

Email: daniel.sexton@coloradosprings.gov

Phone: [redacted]

PROGRAMMATIC AGREEMENT AMONG
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Concurring Parties:

CITY OF COLORADO SPRINGS, LAND USE REVIEW DIVISION, PLANNING & COMMUNITY DEVELOPMENT OFFICE

By: Signature page will be inserted upon receipt Date: ________________
[NAME]
[TITLE]

CITY OF AURORA, HISTORIC SITES AND PRESERVATION OFFICE

By: Signature page will be inserted upon receipt Date: ________________
[NAME]
[TITLE]

THREE AFFILIATED TRIBES OF THE MANDAN, HIDATSA & ARIKARA NATION

By: Signature page will be inserted upon receipt Date: ________________
[NAME]
[TITLE]

SOUTHERN UTE INDIAN TRIBE

By: Signature page will be inserted upon receipt Date: ________________
[NAME]
[TITLE]

ROSEBUD SIOUX TRIBE

By: Signature page will be inserted upon receipt Date: ________________
[NAME]
[TITLE]

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APPENDIX A
LIST OF CONSULTING PARTIES

Stakeholders:
PAFB/SAFB:
City of Colorado Springs
El Paso County Commissioners

BAFB:
City of Aurora
Colorado Department of Transportation
Arapahoe County Commissioners
Plains Conservation Center

Affiliated Native American Tribes:

Apache Tribe of Oklahoma
Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation
Cheyenne and Arapaho Tribes of Oklahoma
Cheyenne River Sioux Tribe
Comanche Nation of Oklahoma
Crow Nation
Eastern Shoshone Tribe of Wind River Reservation
Flandreau Santee Sioux Tribe of South Dakota
Fort Belknap Indian Community
Fort Sill Apache Tribe
Jicarilla Apache Tribe
Kiowa Tribe of Oklahoma
Lower Brule Sioux Tribe of the Lower Brule Reservation, SD
Mescalero Apache Tribe
Northern Arapaho Tribe
Northern Cheyenne Tribe
Oglala Sioux Tribe
Pawnee Nation of Oklahoma
Pueblo of Taos
Pueblo of Zuni
Rosebud Sioux Tribe
Santee Sioux Nation
Southern Ute Indian Tribe
Spirit Lake Nation
Standing Rock Sioux Tribe
Three Affiliated Tribes of the Mandan, Hidatsa & Arikara Nation
Upper Sioux Indian Community
Ute Indian Tribe of the Uintah & Ouray Reservation
Ute Mountain Ute Tribe
Yankton Sioux Tribe

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**APPENDIX B
INTEGRATED CULTURAL RESOURCES MANAGEMENT PLAN
CHAPTER 7.0, STANDARD OPERATING PROCEDURES**

7.0 STANDARD OPERATING PROCEDURES

This section contains SOPs for managing and protecting cultural resources. The Cultural Resources Manager (CRM) ensures that appropriate procedures are properly communicated and followed by necessary personnel.

7.1 Communication, Planning, and Environmental Impact Analysis Process (EIAP)

Applicability Statement: This SOP applies to all USAF installations.

Background/Overview: The EIAP is the USAF procedure for performing environmental project review, in compliance with the requirements of the NEPA. The proponent of an action is responsible for initiating the EIAP early in the planning stages of a proposed action. The EIAP is documented on Air Force (AF) Form 813, *Request for Environmental Impact Analysis*. The CRM must be familiar with NEPA and the EIAP process.

Procedure:

The CRM shall, at a minimum:

- Work in close coordination with the EIAP manager during all NEPA reviews;
- Assist the EIAP manager to determine whether existing and planned formal agreements under NHPA or other cultural resources authorities may be associated with the NEPA planning effort;
- Confirm that NHPA Section 106 review is required and identify other applicable cultural resources laws;
- Identify and consult with SHPO/THPO/local governments/other parties; and
- Plan for public participation, as necessary.

NOTE: ***A CATEGORICAL EXCLUSION UNDER NEPA DOES NOT EXCLUDE THE ACTION/PROJECT FROM COMPLIANCE REVIEW UNDER SECTION 106. ALL PROJECTS ARE TO BE REVIEWED UNDER SECTION 106 BY THE CRM FOR POTENTIAL FOR ADVERSE EFFECTS TO HISTORIC PROPERTIES, AND RESULTS OF EACH REVIEW ARE TO BE DOCUMENTED FOR ANNUAL REPORTS, DATA CALLS, AND AFCEC REVIEW.***

7.2 36 CFR § 800 Process (Implementing NHPA Section 106)

Applicability Statement: This SOP applies to all USAF installations

Background/Overview: 36 Code of Federal Regulation (CFR) § 800 implements Section 106 of the NHPA. It is a federal review process designed to ensure that historic properties are considered during the planning and execution of federal undertakings. Activities, programs, or projects that have the potential to involve or affect historic properties and could trigger a 36 CFR § 800 consultation include, but are not limited to:

- Rehabilitation, renovation, or addition to buildings, structures, and/or utilities;
- Replacement or maintenance of infrastructure;
- Demolition of buildings and structure;
- Proposed beddowns;
- Environmental Restoration Program (ERP) investigations and clean-up; and
- Real property actions such as land transfers, out-leasing, etc.

The 36 CFR § 800 review process should be initiated early in the planning stages of a project.

Procedure:

Project Proponents should:

- During initial project planning (e.g., completion of AF Form 813; AF Form 332, *Base Civil Engineer Work Request*; DD Form 1391, *Military Construction Project Data*, AF Information Management Tool (IMT) 103, *Base Civil Engineering Work Clearance Request* ["Dig Permit"]), provide adequate information necessary to determine whether historic properties are present and to assess impact of the proposed project on historic properties.
- If a proposed project could involve preparation of an environmental assessment or environmental impact statement, contact the installation CRM as early as possible to ensure that any required public participation, analysis, and review can be planned to meet the requirements of both NEPA and NHPA Section 106 in a timely and efficient manner.
- Implement mitigation or management conditions stipulated by the CRM resulting from the Section 106 review/consultation/coordination process.

The CRM should:

- Determine whether the proposed action is an undertaking IAW 36 CFR § 800. If the action is an undertaking, define the Area of Potential Effect (APE) and determine if any historic properties are present within the APE. Assess impact of proposed project on historic properties. Document the results of this review which could include:
  - ***No Historic Properties Affected***: This determination is made when the project will have no foreseeable effects on historic properties. The installation should seek concurrence from the COSHPO and other consulting parties (i.e., tribal stakeholders); or
  - ***No Adverse Effect***: This determination is made when there might be an effect, but the effect will not be harmful to those characteristics that qualify the property for inclusion in the NRHP. The installation must seek concurrence from the COSHPO and other consulting parties that no adverse effect is likely; or
  - ***Adverse Effect***: This determination is made when the effect of an undertaking could diminish the integrity of the characteristics that qualify the property for the NRHP. The installation will continue consultations with the COSHPO and other interested parties whenever an "adverse effect" is likely, expected, or unavoidable.

- Coordinate execution of 36 CFR § 800 process to support desired project schedules. Refer to the Cultural Resources Management Playbook for detailed descriptions of the Section 106 review process.

7.3 Cultural Resources Contracting

Applicability Statement: This SOP applies to all USAF installations.

Background/Overview: USAF Planning, Programming, Budgeting, and Execution (PPBE) is the process of acquiring funding for activities. Contracting of cultural resources-related work follows standard USAF PPBE processes. The Environmental Quality PPBE Playbook and Activity Management Plan Playbooks contain detailed information on funding and contracting.

Procedure:

- The CRM proposes future projects and includes them in the ICRMP and in the Accountable Property System of Record (APSR).
- If the project is determined to be eligible and funds are available for the project, the CRM/AFCEC CRMM develops a detailed statement of work and moves forward with contracting options.

7.4 Discoveries of Archaeological Resources and NAGPRA Cultural Items

Applicability Statement: This SOP applies to all USAF installations that contain or potentially contain archaeological resources and/or NAGPRA cultural items.

Background/Overview: Accidental or unanticipated discoveries of archaeological resources may occur on USAF controlled lands. When discoveries occur, the proper actions must be taken to minimize damage to these resources and to ensure that legal requirements are met. The relevant statute is Archaeological Resources Protection Act (ARPA) and the regulation is 32 CFR Part 229, *Protection of Archaeological Resources*.

There is also an important legal subset of archaeological resources, which includes NAGPRA cultural items (i.e., Native American human remains, associated or unassociated burial artifacts, and objects of cultural patrimony). The relevant regulation is 43 CFR Part 10, *Native American Graves Protection and Repatriation Regulations*. See the Cultural Resources Management Playbook for detailed guidance on the requirements of NAGPRA and this regulation.

It is a federal offense, under the provisions of ARPA and 32 CFR Part 229, to excavate, remove, damage, or otherwise deface any archaeological resources located on federal lands, without authorization. The provisions of ARPA apply to archaeological material greater than 100 years in age, regardless of the NRHP status of the site where they are found. Any person wishing to excavate or remove archaeological resources from an USAF installation must apply for an ARPA permit. USAF-contracted work is exempted from the permitting provision of ARPA. In the event of a permit request, the installation CRM should notify the AFCEC Section CRS. Detailed information to assist in facilitating ARPA permitting is available in the Cultural Resources Management Playbook.

Procedure:

USAF or contractor personnel that make or become aware of a potential archaeological discovery on installation lands should:

- Immediately notify the CRM of the nature and location of the discovery; and
- Immediately cease potentially damaging activities and take efforts to ensure protection of resources until arrival of the CRM or designee.

The CRM should:

- Notify Security Forces of the discovery to facilitate their protection;
- Ensure that all archaeological items are left in place and that no further disturbance is permitted to occur;
- Sufficiently identify the location of the discovery to provide efficient relocation, yet take efforts to minimize the types of signs that could attract personnel and place the discovery in danger; and
- Direct installation personnel and contractors to take efforts to resume mission-associated activities in a reasonable and timely manner if possible.

Security Forces should:

- Notify the Wing Commander regarding the location, nature, and circumstances of the discovery; and
- Provide security/protection for the site to prevent unauthorized disturbance, looting, or vandalism.

If human remains are discovered or if there is sufficient reason to suspect that human remains are present, the CRM should:

- Determine (with the aid of a coroner or forensic anthropologist) if the remains are human, and whether or not they are associated with an archaeological deposit.
- If the remains are not human, and not associated with an archaeological deposit, work may continue.
- Invite consultation with Native American tribes, as appropriate. If a qualified professional finds the human remains to be Native American, the provisions of NAGPRA apply. Follow the procedures outlined in 43 CFR Part 10 or in existing installation NAGPRA agreements with tribes.

7.5 Native American Access

Applicability Statement: This SOP applies to USAF installations that receive requests from Native American Tribes or tribal members for access to USAF property for various reasons.

Background/Overview: Members of federally-recognized tribes have the right to access sites of traditional, cultural, or religious importance on lands under USAF control and to practice traditional religious activities associated with these sites. Tribal members may also request permission to collect small amounts of minerals or plant or animal materials for traditional, cultural, or religious purposes. Installations should routinely grant such permission, within the constraints of operational and/or safety concerns.

Procedure:

The Wing Commander, or Designee, should:

- Perform initial contact required to establish government-to-government relationships with tribes and consult with tribal leaders;

- Establish procedures for day-to-day working relationships with appropriate tribal representatives;
- Establish government-to-government relationships with federally-recognized affiliated tribes; and,
- Document all government-to-government contacts, identification of specific tribal requirements and POCs for future consultation and coordination activities.

The Installation Tribal Liaison Officer (ITLO), with assistance from the CRM and AFCEC Peterson Section CRMM, should:

- Identify appropriate tribes with whom to establish ongoing relations for involvement in any subsequent planning processes. Document appropriate tribes, affected lands and specific access procedures in the 'Native American Tribes with Ancestral Ties to Installation Lands' table below;
- Facilitate and maintain government-to-government relationships;
- Compile and maintain a list of tribal POCs for consultation and coordination; brief incoming commanders on their responsibilities and arrange meetings, as appropriate;
- Conduct routine consultation and coordination with affiliated tribes per the requirements identified during the government-to-government contact; and
- Maintain documentation of consultation and coordination and other contracts.

Native American Tribes with a Cultural Affiliation to each Selected Base

Culturally-Affiliated Tribe
Apache Tribe of Oklahoma
Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation
Cheyenne and Arapaho Tribes of Oklahoma
Cheyenne River Sioux Tribe
Comanche Nation of Oklahoma
Crow Nation
Eastern Shoshone Tribe of Wind River Reservation
Flandreau Santee Sioux Tribe of South Dakota
Fort Belknap Indian Community
Fort Sill Apache Tribe
Jicarilla Apache Tribe
Kiowa Tribe of Oklahoma
Lower Brule Sioux Tribe of the Lower Brule Reservation, SD
Mescalero Apache Tribe
Northern Arapaho Tribe
Northern Cheyenne Tribe
Oglala Sioux Tribe
Pawnee Nation of Oklahoma
Pueblo of Taos
Pueblo of Zuni
Rosebud Sioux Tribe
Santee Sioux Nation
Southern Ute Indian Tribe
Spirit Lake Nation
Standing Rock Sioux Tribe

Three Affiliated Tribes of the Mandan, Hidatsa & Arikara Nation
Upper Sioux Indian Community
Ute Indian Tribe of the Uintah & Ouray Reservation
Ute Mountain Ute Tribe
Yankton Sioux

7.6 Accidents and Emergencies Affecting Historic Properties

Applicability Statement: This SOP applies to all USAF installations.

Background/Overview: Federal laws and regulations provide exceptions to the standard Sections 106 and 110 reviews that may be used in times of emergency. Immediate rescue and salvage operations conducted to preserve life or property are exempt from the provisions of Section 106 and the procedures outlined in 36 CFR § 800.12. Per 36 CFR Part 78, the Secretary of the Air Force may waive all or part of the USAF's Section 106 responsibility on a specific undertaking if the Secretary determines the existence of an imminent major natural disaster or a threat to national security. Such waivers will not exceed the period of the emergency, and generally do not extend to reconstruction or other activities beyond those immediately required to prevent endangerment of human life or property.

Procedure:

The following actions may be performed when responding to an accident or emergency situation (e.g., hazardous material spill, aircraft or vehicular accidents, fires/explosions, natural disasters) where cultural resources may be affected:

USAF Personnel, Construction Crews, Utility Workers, Contractors, and Rescue Workers should:

- Notify the CRM as soon as possible upon realizing potential for impact to cultural resources associated with an emergency situation.
- Take reasonable steps to avoid or minimize disturbance of significant cultural resources during emergency operations, as appropriate to concerns for human life or property.

The CRM should:

- Identify cultural resources that might be affected by emergency response and provide guidance and advice to emergency operations workers on methods to avoid or minimize negative effects to cultural resources
- As soon as possible, notify the Installation Commander and AFCEC of the emergency or disaster, including descriptions of historic properties potentially affected.
- Per Stipulation V(C) of the PA, Buckley AFB will notify the COSHPO via telephone within 48 hours of commencing the emergency situation. As soon as practicable and within 14 days of the conclusion of the emergency situation, notify the THPOs and other stakeholders of any adverse effects to historic properties that resulted from the emergency and emergency response. *[Neither Peterson Air Force Base or Schriever Air Force Base do not have similar agreement documents in place.]*
- Consult with the COSHPO/THPO about steps necessary to reduce or mitigate adverse effects to historic properties when additional actions are necessary to stabilize, repair, or demolish historic properties damaged in the emergency or emergency response (e.g., demolition of historic properties that cannot be repaired, or have become unsafe)

- If a waiver is requested, provide information to installation personnel regarding the status of the waiver request (granted or denied) and direction regarding follow-on notification of parties.
  - If a waiver is granted, provide information regarding the scope and limitations of the waiver to appropriate installation personnel and initiate required notifications to COSHPO
  - If a waiver is not granted, provide direction to installation personnel regarding resumption of work and implement the Section 106 consultation process.

7.7 Suspected Vandalism

Applicability Statement: This SOP applies to all USAF installations.

Background/Overview: The installation has established procedures to deter vandalism and to investigate suspected acts of vandalism when a cultural resource protected under NHPA, ARPA, or NAGPRA is damaged as a result of unauthorized activity.

Procedure: In the event of a discovery of damaged archaeological site or other historic property, the following actions should be performed:

Discoverer of potential looting or vandalism should:

- Immediately notify the CRM and Security Forces;
- Take all necessary precautions to protect the resource from further damage, loss, or destruction; and
- Wait for further instructions from the CRM or other authority.

Security Forces should:

- Notify the Installation Commander immediately regarding the location, nature, and circumstances of the looting or vandalism; and
- Provide security/protection to prevent further unauthorized disturbance, looting, or vandalism.

The CRM should:

- Inspect the site to assess damage with the aid of a SOI-qualified archaeologist;
- Notify the Installation Commander of damage within 48 hours of discovery. Include the following information in the damage report: Circumstances of site damage, assessment of the nature and extent of damage, recommendations for treatment procedures (coordinate with SHPO and tribal authorities, as appropriate), and suggestions for future protection measures; and
- Notify Native American organizations and individuals if traditional cultural resources or sacred sites were damaged.

Legal Department personnel should:

- Assess whether or not accused violators can be prosecuted; and
- Determine whether a civil penalty or other prosecution can be applied.

7.8 Curation of Collections and Records

Applicability Statement: This SOP applies to USAF installations that maintain archaeological collections that require curation. This installation DOES/DOES NOT maintain such a collection and IS/IS NOT required to implement this SOP.

Background/Overview: Federal regulations require curation of archaeological collections and their associated records owned by federal agencies in perpetuity (36 CFR Part 79, *Curation of Federally Owned and Administered Archeological Collections*). Curation of artifacts collected from USAF property shall be consistent with procedures in the *Guidelines for the Field Collection of Archaeological Materials and Standard Operating Procedures for Curating Department of Defense Archaeological Collections* (1999, Legacy Project No. 98-1714). Specific recommendations and procedures for curation are described in this ICRMP, where applicable, and in the Cultural Resources Management Playbook. Records related to historic properties or historic preservation should be evaluated for their usefulness in documenting the history of the installation's cultural resources and should be maintained or disposed of as appropriate.

Procedure:

The CRM should:

- Ensure that installation personnel are aware of the historic value of old records, collections, etc.;
- Identify federally-owned and administered archaeological collections and associated records required to be curated;
- Identify an appropriate curation facility (or facilities).
  - For Buckley AFB, archaeological collections and their associated records are currently maintained at the Curation Facility on F.E. Warren AFB, Cheyenne, Wyoming.
  - For Peterson AFB and Schriever AFB, archaeological collections and their associated records are currently maintained at the Curation Facility on Fort Carson Army Garrison, Colorado Springs, Colorado.
- Prepare collections for moving to the identified curation facility;
- Make a duplicate copy of all documentation on either acid-free paper or in digital format and store in a separate, secure, fire-safe location;
- Transfer collections to the appropriate facility;
- Conduct an annual inventory and inspect curated collections for compliance with applicable requirements; and
- Maintain records/documents regarding transferred collections.

7.9 Management and Coordination

Applicability Statement: This SOP applies to all USAF installations.

Background/Overview: The following procedure outlines and describes cultural resources-related communication, review, and coordination processes and workflows.

Procedure:

Internal Reviews

Internal review procedures will be initiated as early in project planning as possible so that personnel are allowed sufficient time to implement appropriate cultural resource activities, as required. Specific documents and processes that require internal review include:

- Completion of AF Form 332 for proposed work to Civil Engineering to determine whether the proposed work will affect any natural or cultural resources;
- Completion of AF IMT 103 generally for work involving digging to CE to determine whether the proposed work will affect any natural or cultural resources; or
- NEPA project review including the EIAP and completion of AF Form 813.

Notification and Consultation

- Consultation can be required at any time with Native American tribal groups or other stakeholders at the discretion of the CRM and the ITLO.
- Notification and consultation with tribal groups must occur immediately if any human remains are encountered.

Stakeholder Reviews

- Installation stakeholders can include, but are not limited to: the COSHPO, Tribes, local surrounding communities, and the National Park Service (NPS).
- The Public Affairs Office manages the official website for the installation and uploads cleared, sanctioned information for public access.
- The installation CRM and the ITLO are responsible for contacting NPS, COSHPO, and all tribal groups for any reviews of cultural resource documents.

Agreement Documents

- Agreement documents, such as MOAs, PAs, CAs, Plans of Action, etc. will be drafted and coordinated by the CRM and approved by the Installation Commander.
- Agreement documents are referenced in the Appendix section of this ICRMP.

GIS Management

- The installation maintains maps showing locations of certain significant cultural resources. These maps are maintained by Environmental personnel in the Civil Engineer Squadron.
- According to 32 CFR Part 229, information divulging the location and character of archaeological sites should be limited to parties involved in management and/or planning and shall not be divulged to the general public. Such confidentiality prevents damage to sites. In the spirit of ARPA, all maps of archaeological sites have restricted access. Access will be granted by the CRM IAW user need and 32 CFR Part 229.

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

SEP 03 2019

Lieutenant Colonel Jason M. Aftanas
Commander, 30th Civil Engineer Squadron
[redacted]

Ms. Julianne Polanco
State Historic Preservation Officer
Department of Parks and Recreation
Office of Historic Preservation
[redacted]

Dear Ms. Polanco

The United States Air Force (USAF) proposes Vandenberg Air Force Base (VAFB) as one of five alternative locations where headquarters for the newly-established U.S. Space Command would be constructed. Four other Department of Defense installations also are being considered: Buckley AFB, Peterson AFB, and Schriever AFB in Colorado; and the U.S. Army Garrison Redstone Arsenal in Alabama. For the VAFB alternative, one interim site alternative (three separate existing facilities) and one 23-acre permanent site alternative (proposed new construction) were identified to support this headquarters basing initiative, both of which are in the cantonment area on North VAFB, in Santa Barbara County, California. The project alternative located at Vandenberg AFB is an undertaking subject to compliance with Section 106 (codified at 54 USC 306108) of the National Historic Preservation Act (NHPA) of 1966, as amended (54 USC 300101 et seq.: Historic Preservation). For the VAFB alternative only, VAFB will comply with Section 106 using the implementing regulations (36 CFR Part 800) and is hereby initiating consultation with the State Historic Preservation Officer (SHPO).

VAFB carried out a reasonable and good-faith investigation that fulfills federal agency responsibilities pursuant to 36 CFR 800.4(a)-(d). The area of potential effects (APE) is made up of four discontiguous activity areas: the 23-acre permanent site alternative plus three facilities that comprise the interim site alternative (Facilities 6523, 7525, and 10577). No cultural resources exist within the boundaries of the Permanent Site Alternative. The three facilities comprising the Interim Site Alternative are included in the APE due to proposed renovations at each of the three buildings. Facilities 6523, 7525, and 10577 were recorded and evaluated for NRHP-eligibility for the first time during this study. None of these three buildings meets the criteria for NRHP-eligibility. No other cultural resources exist within or immediately adjacent to the Project APE, and the APE has a low archaeological sensitivity. Details of the investigation are provided in the attachment.

As such, Vandenberg AFB presents the following federal agency determinations for concurrence from the SHPO:

a. The APE for the Vandenberg AFB alternative of the *U.S. Space Command Headquarters Basing and Construction Project* is adequately delineated; and

b. The following three buildings within the APE are not eligible for listing on the NRHP: Facility 6523 (P-42-041307), Facility 7525 (P-42-041274), and Facility 10577 (P-42-041308).

Pending concurrence with the above determinations, Vandenberg AFB reached a Section 106 finding of *no historic properties affected* for this undertaking. If you do not object to this finding, Vandenberg AFB has fulfilled its Section 106 responsibilities for this undertaking and no further consultation is required. If project implementation results in an inadvertant discovery during construction, Section 106 consultation would be reinitiatied.

Furthermore, because a building as much as four-stories tall would be built at the permanent site alternative, a radius of 0.25-mile (1,320 feet) around that location was created as an architectural study area for the purposes of identifying built-environment historic properties and, if any were present, assessing potential effects to the integrity of setting. No built-environment historic properties were identified. Because that evaluation effort was completed in support of the Vandenberg AFB alternative, Vandenberg AFB also is requesting concurrence from the SHPO that the following eight buildings within the study area are not eligible for the NRHP, even though those buildings are not within the APE:

Facility 7403 (P-42-041269)	Facility 7437 (P-42-041313)
Facility 7414 (P-42-041309)	Facility 8190 (P-42-041314)
Facility 7420 (P-42-041310)	Facility 8305 (P-42-041315)
Facility 7425 (P-42-041311)	Facility 8312 (P-42-041316)

If you have any questions or require additional information, please contact Christopher Ryan at [redacted] or via e-mail at [redacted]. Thank you for your assistance with this undertaking.

Sincerely

JASON M. AFTANAS, Lt Col, USAF
Commander

Attachment:
Identification of Historic Properties, U.S. Space Command Headquarters Basing and Construction Project

Appendix B

Special-status Species

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Table B-1
Special-status Species Potentially Occurring at the Buckley, Peterson, and Schriever AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Sites
Plants			
Colorado butterfly plant (*Gaura neomexicana coloradensis*)	FT, CO S1	Prefers sub-irrigated, alluvial soils of drainage bottom surrounded by mixed grass prairie.	No
Ute ladies'-tresses (*Spiranthes diluvialis*)	FT, CO S1	Prefers moist to wet conditions, where competition for light, space, water, and other resources is normally kept low by periodic or recent disturbance events. The types of occupied habitat include alluvial banks, point bars, ox-bows, river floodplains, shores of lakes and reservoirs, and groundwater-fed spring habitats.	No
Western prairie fringed orchid (*Platanthera praeclara*)	FT	Platte River species that prefers moist to wet calcareous (calcium-rich, or alkaline) tallgrass prairies and sedge meadows (many flooded for 1 to 2 weeks per year). It most often grows in relatively undisturbed grassland, but also can be found in moderately disturbed sites such as roadside ditches.	No
Fish			
Arkansas Darter (*Etheostoma cragini*)	FC, ST	Prefers small springs or seeps when they are partly overgrown by watercress or some other kind of aquatic vegetation. It occurs only in the Arkansas River basin in small prairie streams.	No
Greenback cutthroat trout (*Onocorhynchus clarki stomias*)	FT, ST	Occurs in cold, clear foothill and mountain waters of the Arkansas and South Platte Rivers.	No
Pallid sturgeon (*Scaphirhynchus albus*)	FE	Adults inhabit large, deep, turbid river channels; usually in strong current over firm sand or gravel in the main channels of the Missouri River and Lower Mississippi River.	No

Table B-1
Special-status Species Potentially Occurring at the Buckley, Peterson, and Schriever AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Sites
Mammals			
Black-tailed prairie dog (*Cynomys ludovicianus*)	SSC	Inhabit dry, flat, sparsely vegetated grasslands.	Yes Documented with moderate to high potential at all three locations and sites.
Black-footed ferret (*Mustela nigripes*)	Experimental Population; Non-Essential, SE	USFWS has designated the Buckley AFB area as being in a “block clearance zone” that does not support this species.	No
Preble’s meadow jumping mouse (*Zapus hudsonius preblei*)	FT, ST	Uses riparian corridors of streams, lakes, and other wetland areas.	No
Birds			
Western burrowing owl (*Athene cunicularia*)	Colorado Threatened	Primarily found in grasslands and mountain parks, usually in or near prairie dog towns.	Yes Low potential at all three locations and sites.
Ferruginous hawk (*Buteo regalis*)	SSC	Ideal habitat is open grasslands and shrub steppe. They nest in flat, rolling, or rugged terrain in open areas, including shortgrass prairie, canyons, and isolated trees in grasslands, shrublands, or riparian areas.	Yes Documented with moderate potential at all three Colorado installations being considered.
Piping plover (*Charadrius melodus*)	FT, ST	Prefers sandy lakeshore beaches, sandbars within riverbeds, and sandy wetland pastures, all of which must be sparsely vegetated.	No
Mountain plover (*Charadrius montanus*)	SSC	Nesting plovers choose shortgrass prairies grazed by prairie dogs, bison, cattle, and overgrazed tallgrass and fallow fields.	No
Whooping crane (*Grus americana*)	SE	Prefers mudflats around reservoirs and agricultural areas. While wintering, they live on salt flats that are dominated by coastal salt grass. Their nesting grounds are wetland communities dominated by tall, herbaceous wetland vegetation.	No

Table B-1
Special-status Species Potentially Occurring at the Buckley, Peterson, and Schriever AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Sites
Bald eagle (*Haliaeetus lecocephalus*)	SSC	Species occurs around lakes and rivers in the winter. Generally, winter habitat preferences for the bald eagle include a readily available food source associated with ice-free waters, diurnal perches, nocturnal roost trees, and low human activity. The bald eagle is a transient visitor to the area in the winter.	No
Interior least tern (*Sterna antillarum*)	FE, SE	Prefers wide unobstructed river channel areas that are sparsely vegetated with sand and gravel bars for nesting habitat. Least terns also use artificial habitats such as sand and gravel pits and dredge islands.	No
Mexican spotted owl (Strix occidentalis lucida)	FT, ST	Resident of lower elevation forests mostly in deeply incised, rocky canyons or can be found in complex forest structures that contain uneven aged, multilevel and old-aged, thick forests.	No
Reptiles			
Common garter snake (*Thamnophis sirtalis*)	SSC	Species occurs in a variety of habitats, but prefers moist, grassy areas near water.	No

Notes:

[1] Status: FE = Federally Endangered; FT = Federally Endangered; FC = Federal Candidate; SE = Colorado Endangered; ST = Colorado Threatened; SSC = Colorado Species of Special Concern; S1 = Colorado Critically Imperiled; and S2 = Colorado Imperiled.

Sources: Sovell and Doyle 2018a,b,c; USAF 2016a, 2017, 2018.

Table B-2
Special-status Species Potentially Occurring at the Vandenberg AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Site
Plants			
Beach layia (*Layia carnosa*)	FE, CESA E	Occurs on semi-stabilized sand in sparse coastal dune scrub habitats. Known in two occurrences on the southern portion of Vandenberg AFB near Surf Road (USAF, 2011a).	No
Gambel's watercress (*Nasturtium* [*Rorippa*] *gambellii*)	FE, CESA E	Inhabits permanent freshwater or brackish wetland habitats with minimal competition from other vegetation. One occurrence known north of the Vandenberg AFB main gate (USAF, 2011a).	No
Lompoc yerba santa (*Eriodictyon capitatum*)	FE, CESA SR	Occurs in maritime chaparral and Bishop pine forest habitats, on soils with a large sand component; suitable soils tend to be acidic (USAF, 2011a).	No
Gaviota tarplant (*Deinandra increscens* spp. *villosa*)	FE, CESA E	Occurs in native and non-native grassland and occasionally in coastal scrub habitats, on sandy soils. Known populations near Point Sal and Point Arguello on Vandenberg AFB (USAF, 2011a).	No
Vandenberg monkeyflower (*Diplacus vandenbergensis*)	FE	Occurs in sandy openings in coastal scrub, chaparral, and woodland on the Burton Mesa landscape (USAF, 2011a).	No
Sea-side bird's-beak (*Cordylanthus rigidus* spp. *littoralis*)	CESA: E	Occurs on sandy soils subject to disturbance, including margins of fuel breaks, infrequently traveled dirt roads and trails, and sparsely vegetated banks and slopes (USAF, 2011a).	No
Surf thistle (*Cirsium rhothophilum*)	CESA: T	Occurs on stabilized dunes, ocean bluffs, and ocean-facing foredunes (USAF, 2011a).	No
Beach spectaclepod (*Dithyrea maritima*)	CESA: T	Occurs on active sand dunes and foredunes, especially on the margins of blowouts and areas with high sand movement (USAF, 2011a).	No

Table B-2
Special-status Species Potentially Occurring at the Vandenberg AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Site
Invertebrates			
El Segundo blue butterfly (*Euphilotes battoides allyni*)	FE	Occurs in coastal scrub communities that support species' host plant, seacliff buckwheat (*Eriogonum parvifolium*). Species feeds and breeds exclusively on seacliff buckwheat (USAF, 2011a).	No
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	Occurs in vernal pool habitats. Most suitable pools are less than 0.05 acre in size with grassy or muddy bottoms, most typically in grassland areas (USAF, 2011a).	No. Vernal pool fairy shrimp may be present in vernal pools adjacent to the existing parking lot at Interim Site 1, but would not be subject to disturbance or impacts. Vernal pool within alternative Permanent Site 1 previously determined by USFWS to be unsuitable for this species.
Monarch butterfly	ESA: Under Review County regulations protect overwintering sites.	Overwinters in protected eucalyptus (*Eucalyptus* spp.) and cypress (*Cupressus macrocarpa*) groves in coastal California. Breeds on milkweed (*Asclepias* spp.) (USAF, 2011a).	No
Black abalone (*Haliotis cracherodii*)	FE	Benthic mollusk, inhabits rocky intertidal and subtidal habitats from the high intertidal zone to approximately 6 meters in depth (NOAA 2019; USAF, 2011a).	No
Fish			
Unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*)	FE, CESA E, CDFW FP	Inhabits slow, quiet areas with low turbidity and aquatic vegetation in freshwater streams and rivers. Population known in San Antonio Creek (USAF, 2011a).	No
Tidewater goby (*Eucyclogobius newberryi*)	FE, CDFW SSC	Inhabits small coastal lagoons, lower stream reaches, and upper portions of large bays, typically in brackish waters. Populations known in San Antonio Creek and Santa Ynez River (USAF, 2011a).	No

Table B-2
Special-status Species Potentially Occurring at the Vandenberg AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Site
Southern steelhead (*Oncorhynchus mykiss*)	FE	Anadromous species that occurs in northern Pacific Ocean and adjacent coastal stream and estuaries. Population known in Santa Ynez River and Jalama Creek (USAF, 2011a).	Yes Documented with low potential of occurrence in the Santa Ynez River near Lompoc.
Arroyo chub (*Gila orcuttii*)	CDFW SSC	Inhabits sandy and muddy substrates in flowing pools and runs of headwaters creeks, intermittent streams, and small to medium rivers. Documented occurrences in San Antonio Creek and Santa Ynez River (USAF, 2011a).	Yes Documented with low potential of occurrence in the Santa Ynez River near Lompoc.
Mammals			
Southern sea otter (*Enhydra lutris nereis*)	FE CDFW FP	Occurs in nearshore marine environments. Optimal habitats include rocky substrates and kelp beds. Occurrences documented off coastal Vandenberg AFB (USAF, 2011a).	No
Pallid bat (*Antrozous pallidus*)	CDFW SSC	Inhabits open, dry habitats with suitable rocky sites, including crevices in outcrops, caves, and mines for roosting. Occasionally occurs in evergreen forests. Tree roosts and suitable structures such as bridges may be used as roosts. Forages over open grasslands, orchards, vineyards, pine forests, slopes and roads (Eder, 2005, WBWG, 2019). Documented roost on south Vandenberg AFB (USAF, 2011a).	No
Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)	CDFW SSC	Occurs in open areas near coniferous woodland and arid habitats, desert, riparian communities, and agricultural areas. May use buildings, bridges, rock crevices, and tree cavities for roosting. Forages in edge habitats along streams and adjacent to and within woodland habitats (Eder, 2005; WBWG, 2019).	No

Table B-2
Special-status Species Potentially Occurring at the Vandenberg AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Site
Western mastiff bat (*Eumops perotis*)	CDFW SSC	Occurs in a variety of arid habitats and semi-arid woodland habitats with rocky or cliff sites for roosting. Buildings occasionally used for roosting. Forages over open areas (Eder, 2005, WBWG, 2019).	No
Birds			
Western snowy plover (*Charadrius nivosus*)	FT, CDFW SSC (nesting)	Coastal strand habitats with sparse vegetation. Nests on sand beaches, salt flats, coastal dunes, and river bars above the mean high-tide line. Occurs on sandy beaches and adjacent coastal dunes along western boundary of Vandenberg AFB (USAF, 2011a).	No
California least tern (*Sternula* [*Sterna*] *antillarum browni*)	FE, CESA E, CDFW: FP (nesting colony)	Localized and fragmented populations. Nests in colonies on relatively open, naturally vegetation-free beaches and coastal foredunes. Populations known in coastal areas of Vandenberg AFB (USAF, 2011a).	No
Marbled murrelet (*Brachyramphus marmoratus*)	FT CESA E	Nests in mature coniferous forests typically within 50 miles of the coast and forages in nearshore marine habitats (USFWS, 1997).	No
Southwestern willow flycatcher (*Empidonax traillii extimus*)	FE, CESA E (nesting)	Occupies riparian habitats with dense vegetation, typically willow, buttonbush, or coyote brush with an overstory of cottonwoods. Occurrences documented in Santa Ynez River (USAF, 2011a).	No
Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)	CESA E	Occurs in saline, emergent wetlands, typically dominated by pickleweed. Subspecies of savannah sparrow known to occur in Santa Ynez River estuary; unclear if this population is of Belding's (USAF, 2011a).	No

Table B-2
Special-status Species Potentially Occurring at the Vandenberg AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Site
American peregrine falcon (*Falco peregrinus anatum)*	CDFW FP (nesting)	Nests on high, rocky outcroppings and the ledges of high cliff faces, often near a water source (USAF, 2011a).	No
Ashy storm-petrel (*Oceanodroma homochroa*)	CDFW SSC (nesting colony)	Pelagic. Nests in cavities on outlying rock formations adjacent to Pacific Ocean. Breeding not confirmed on Vandenberg AFB (USAF, 2011a).	No
Western least bittern (*Ixocrychius exilis*)	CDFW SSC (nesting)	Occurs in freshwater and coastal brackish marshes with emergent vegetation. Documented along Santa Ynez River (USAF, 2011a).	No
Golden eagle (*Aquila chrysaetos*)	Federal: Bald and Golden Eagle Protection Act CDFW FP (nesting and wintering)	Inhabits open and semi-open grassland, chaparral, scrubland, and forest habitats. Nests on cliffs and steep escarpments. Occurs year-round on Vandenberg AFB, most often near the mouth of the Santa Ynez River (USAF, 2011a).	No
Northern harrier (*Circus hudsonius*)	CDFW SSC (nesting)	Inhabits large tracts of grassland, marsh, floodplain, and cropland with low vegetation. Nests in shrubby vegetation, usually at the edge of marshes. Documented nesting on north Vandenberg AFB (USAF, 2011a).	No
Mountain plover (*Charadrius montanus*)	CDFW SSC (wintering)	Migratory. Inhabits shortgrass prairie and open, dry grassland habitats; winters in short-grass plains and fields, plowed fields, and sandy deserts. Documented in low numbers in mowed non-native grasslands near airfield (USAF, 2011a).	No
Western burrowing owl (*Athene cunicularia*)	CDFW SSC (burrow sites and wintering sites)	Inhabits open, dry grasslands, deserts, and open scrub habitats with friable soils; high abundance of ground squirrel burrows is preferable. Documented on south Vandenberg AFB (USAF, 2011a).	No

Table B-2
Special-status Species Potentially Occurring at the Vandenberg AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Site
Loggerhead shrike (*Lanius ludovicianus*)	CDFW SSC (nesting)	Inhabits open habitats with scattered trees, posts, fences, utility lines, or other perches in lowlands and foothill areas. Documented in chaparral and coastal scrub habitats on north and south Vandenberg AFB (USAF, 2011a).	No
Yellow warbler (*Dendroica petechial*)	CDFW SSC (nesting)	Migratory. Breeds in riparian forests and woodlands. Documented in riparian woodlands along creeks and rivers on Vandenberg AFB (USAF, 2011a).	No
Yellow breasted chat (*Icteria virens*)	CDFW SSC (nesting)	Migratory. Breeds in dense, second-growth riparian thickets and brush. Documented in riparian woodlands of Barka Slough at the mouth of San Antonio Creek (USAF, 2011a).	No
Tricolored blackbird (*Agelaius tricolor*)	CESA: Candidate E, CDFW SSC (nesting colony)	Breeds in colonies near freshwater, typically in emergent wetlands with tall, dense vegetation such as *Typha* spp. Forages in grassland and croplands. Documented foraging in agricultural fields and along Santa Ynez River, and breeding at Punchbowl Lake on Vandenberg AFB (USAF, 2011a).	No
Amphibians			
California red-legged frog (*Rana draytonii*)	FT, CDFW SSC	Occurs primarily in wetlands and streams in coastal drainages, preferring deep-water, permanent to semi-permanent pools with dense, shrubby, or emergent vegetation. May forage or shelter in uplands and riparian habitats. Occurs in nearly all permanent streams and ponds on Vandenberg AFB (USAF, 2011a).	No

Table B-2
Special-status Species Potentially Occurring at the Vandenberg AFB Sites

Common Name (*Scientific Name*)	Federal/State Status[1]	Habitat	Documented or Potential Habitat Present at the Site
Western spadefoot (*Spea hammondii*)	Federal Listing Under Review, CDFW SSC	Breeds in seasonal pools formed by heavy winter rains and artificial pools in grassland, oak woodland, scrub, and chaparral habitats. Adults spend majority of time in upland refugia, including small mammal burrows (Thomson et al., 2016).	Yes Potential habitat in vernal pool at Permanent Site 1.
Reptiles			
Southwestern pond turtle (*Actinemys marmorata pallida*)	CDFW SSC	Inhabits permanent or semi-permanent pools, lakes, streams, irrigation ditches, and permanent pools associated with intermittent streams (Thomson et al., 2016). Documented in San Antonio Creek and Santa Ynez River (USAF, 2011a).	No
Coast horned lizard (*Phyrnosoma blainsvillii*)	CDFW SSC	Inhabits areas with abundant, open vegetation, an open shrub canopy, and loose, sandy soils in scrub, chaparral, and grassland habitats (Thomson et al., 2016).	No
Silvery legless lizard (*Anniella pulchra pulchra*)	CDFW SSC	Fossorial. Occurs in areas with sandy or loose organic soils and abundant leaf litter in coastal dune scrub, valley-foothill scrub, chaparral, and coastal scrub habitats (Thomson et al., 2016). Documented in dune habitats of Vandenberg AFB (USAF, 2011a).	No

Table B-3
Special-status Species Potentially Occurring at the Redstone Arsenal Sites

Common Name (*Scientific Name*)	**Federal/State Status**	**Habitat**	**Documented or Potential Habitat Present at the Site**
Crustaceans			
Alabama cave shrimp (*Palaemonias alabamae*)	FE, SP	Inhabits flooded caverns; one population found in RSA, Bobcat Cave; potentially threatened by groundwater degradation; RSA has instituted groundwater protection buffer zone in the area of the cave in consultation with USFWS.	No
Fish			
Slackwater darter (*Etheostoma boschungi*)	FT, SP	Its nonbreeding habitat is small to moderately large streams with moderate to slow currents. This species prefers channel bottoms with detritus, but have been found with clean silt, sand, and small gravel substrate. Their breeding habitats are seepages in open fields or woods.	No
Snail Darter (*Percina tanasi*)	FT, SP	Inhabits clean gravel or sandy shoals in large creeks and rivers. Prefers areas lacking aquatic macrophytes and with low degrees of turbidity or siltation.	No
Tuscumbia darter (*Etheostoma Tuscumbia)*	Under Review/ SP	Inhabits springs; potentially threatened by groundwater degradation. This species is endemic to the Tennessee River drainage. This species is restricted to vegetated limestone springs within the Highland Rim. The first population was discovered on RSA at William Spring in the forested floodplain of Indian Creek. This creek and Huntsville Spring Branch make up a complex of an important habitat corridor that transect through RSA.	Yes Documented with a high potential for occurrence in the Indian Creek tributaries based on recent records.

Table B-3
Special-status Species Potentially Occurring at the Redstone Arsenal Sites

Common Name (*Scientific Name*)	Federal/State Status	Habitat	Documented or Potential Habitat Present at the Site
Mammals			
Gray bat (*Myotis grisescens*)	FE, SP	A monotypic species that occupies limited geographic range in the karst limestone region of the Southeastern U.S. Roost in large colonies in caves that provide adequate thermoregulatory capabilities. Not currently occupying caves on RSA; however, mist netting captures indicated the species forages along waterways in RSA. The project location does have forested areas that could provide roosting habitat for this species. Therefore, impacts to this species are possible; however, they can be avoided through pre-construction survey and tree clearing to only occur from October 15 to March 31, and/or coordination with the USFWS. This species had been captured during bat surveys on RSA.	Yes There is low potential of occurrence due to limited water sources in or near the site. However, time-of-year tree clearing restrictions of potential roost trees should be implemented to lessen the risk of accidental take of bats during migration, and movement between habitats during the breeding and foraging periods.
Indiana bat (*Myotis sodalis*)	FE, SP	Mainly inhabits caves and mines as hibernacula, but are found to roost under peeling bark of mostly dead and dying trees. This species has not been detected or observed on RSA. Madison County has no recorded hibernacula. The project location does have forested areas that could provide roosting habitat for this species. Therefore, impacts to this species are possible; however, they can be avoided through pre-construction survey and tree clearing, only to occur from October 15 to March 31, and/or coordination with the USFWS.	Yes There is low potential of occurrence due to limited water sources in or near the site. However, time-of-year tree clearing restrictions of potential roost trees should be implemented to lessen the risk of accidental take of bats during migration, and movement between habitats during the breeding and foraging periods.

Table B-3
Special-status Species Potentially Occurring at the Redstone Arsenal Sites

Common Name (*Scientific Name*)	Federal/State Status	Habitat	Documented or Potential Habitat Present at the Site
Northern long-eared bat (*Myotis septentrionalis*)	FT, SP	Inhabits caves and mines during the winter season, and forages forested areas in the summer. Will use trees and snags as roost trees. RSA management of forested habitats to ensure the presence of preferred roost trees when possible. The project location does have forested areas that could provide roosting habitat for this species. Therefore, impacts to this species are possible; however, they can be avoided through pre-construction survey and tree clearing to only occur from October 15 to March 31, and/or coordination with the USFWS.	Yes There is low potential of occurrence due to limited water sources in or near the site. However, time-of-year tree clearing restrictions of potential roost trees should be implemented to lessen the risk of accidental take of bats during migration, and movement between habitats during the breeding and foraging periods.
Birds			
Bald Eagle (*Haliaeetus leucocephalus*)	Federally Protected under the Bald and Golden Eagle Protection Act	This species is known to use the WNWR as foraging habitat. Bald eagles tend to use undisturbed areas with tall trees as nesting areas. Three nests were documented from the vicinity of Guntersville Dam, about 32 kilometers southeast of RSA. This species has been observed during the winter months along the southern RSA border.	No
Whooping crane (*Grus americana*)	Endangered – outside the experimental population. Threatened – within the experimental population SP	A nonessential population that winters on RSA are part of the experimental population established in the eastern U.S. in 2001. This population uses mudflats and wetlands, which occur within the WNWR boundaries.	No
Wood Stork (*Mycteria americana*)	FT, SP	This species prefers brackish forested wetlands for breeding. Their foraging habitat consists of wetlands, swamps, ponds, and marshes with water depths around 4 to 12 inches.	No

Table B-3
Special-status Species Potentially Occurring at the Redstone Arsenal Sites

Common Name (*Scientific Name*)	Federal/State Status	Habitat	Documented or Potential Habitat Present at the Site
Plants			
Price's potato bean (*Apios priceana*)	FT, State Listed Rare Plant (S2-Imperiled)	Inhabits limestone outcrops on the Interior Low Plateaus and Appalachian Plateaus. The plant is primarily threatened by human disturbance. Seven sites have been documented on RSA on Madkin Mountain, and is documented as the largest with over 2,000 individuals. Since the findings, this area has been designated as an Ecologically Sensitive Area.	No
Morefield's Leather Flower (*Clematis morefieldii*)	FE, State Listed Rare Plant (S2-Imperiled)	Often inhabit seeps in rocky limestone woodlands on the southwest-facing mountain slopes. Species is typically under a partially open to filtered canopy of oak, hickory, ash, smoke tree, and cedar trees.	No
Reptiles			
American Alligator (Alligator mississippiensis)	FT	This species most commonly inhabits swamplands and backwaters along coastal regions. They have been found in the swamp and open-water areas of RSA. This species was introduced to the WNWR in 1980. This species is part of the Huntsville Spring Branch and Bradford Sinks-Swan Pond Ecologically Sensitive Areas.	No
Mussels			
Spectaclecase (*Cumberlandia monodonta*)	FE, SP	This species is critically imperiled in Alabama. This species prefers flowing water in riffle areas of rivers with suitable water quality and the appropriate fish host in the Tennessee River System. It occurs in substrates from mud and sand to gravel, cobble, and boulders in relatively shallow riffles and shoals with a slow to swift current. The potential of organic pollution and chemical waste would preclude its existence on RSA site.	No

Table B-3
Special-status Species Potentially Occurring at the Redstone Arsenal Sites

Common Name (*Scientific Name*)	Federal/State Status	Habitat	Documented or Potential Habitat Present at the Site
Fanshell (*Cyprogenia stegaria*)	FE, SP	Inhabits gravel substrate in medium to large rivers. Distribution and reproductive capacity has been impacted by construction and operations of reservoirs and substrate and water quality.	No
Snuffbox (*Epioblasma triquetra*)	FE, State Listed Partial Status Mussel	This species inhabits small to medium-sized creeks, to large rivers, and in lakes. It prefers swift currents of riffles and shoal, and wave-washing shores of lakes over gravel and sand with occasional cobble and boulders	No
Pink mucket (*Lampsilis abrupta*)	FE, SP	This species was documented in the WNWR along the southern boundary along the Tennessee River. This mussel can be found in mud and sand, and shallow riffles and shoals swept free of silt in major rivers and tributaries.	No
Ring pink (*Obovaria retusa*)	FE, SP	This mussel is found in shallow water over silt-free sand and gravel bottoms of large rivers. This species once inhabited the Tennessee River, but is now considered extirpated from Alabama.	No
White wartyback (*Plethobasus cicatricosus*)	FE, SP	This mussel is found in clean, fast-flowing water in silt-free rubble, gravel, and sand bottoms of large rivers. It historically occurred downstream near Muscle Shoals in the Tennessee River.	No
Orange-foot pimpleback (*Plethobasus cooperianus)*	FE, SP	This mussel is found in clean, fast-flowing water in silt-free rubble, gravel and sand bottoms of medium to large rivers. Habitat not present in RSA.	No
Sheepnose (*Plethobasus cyphyus)*	FE, SP	This is a larger-stream species occurring primarily in shallow shoal habitats with moderate to swift currents over coarse sand and gravel with substrate of mud, cobble, and boulders. They may occur at the depths exceeding 6 meters. Habitat declined due to water quality and sedimentation.	No

Table B-3
Special-status Species Potentially Occurring at the Redstone Arsenal Sites

Common Name (*Scientific Name*)	Federal/State Status	Habitat	Documented or Potential Habitat Present at the Site
Rough pigtoe (*Pleurobema plenum*)	FE, SP	This mussel, which was known to occur in WNWR, is found in a wide variety of streams from large to small.	No
Slabside pearlymussel (*Pleuronaia dolabelloides*)	FE, SP	This species is primarily found in large creeks to moderately sized rivers. It prefers gravel substrate with interstitial sand with moderate current, at depths less than 1 meter deep in moderate to swift current velocities.	No
Fluted kidneyshell (*Ptychobranchus subtentus*)	FE, SP	This species inhabits small to medium rivers in areas with swift currents or riffles. There are a few populations recorded in larger rivers in shoal areas. It prefers sand, gravel, and cobble channel substrates.	No
Rabbitsfoot (*Quadrula cylindrica cylindrica*)	FT, SP	The typical habitat for this species is small to medium rivers with moderate to swift currents, and in smaller streams it inhabits bars or gravel and cobble close to the fast current. This species also has been found in medium to large rivers in sand and gravel, and up to depths to 3 meters.	No
Pale Lilliput (*Toxoplasma cylindrellus*)	FE, SP	This species is found in small tributaries and streams, in less than 1 meter of water. It prefers gravel and sandy substrates in either a slow or medium current. It was known to inhabit Indian Creek.	No
Snail			
Slender campeloma (*Campeloma decampi*)	FE, SP	This species is endemic to the Tennessee River drainage in Alabama. This snail is associated with shallow, low-flow areas with silt and clay near the stream margin.	No

Status: FT = Federal Threatened; FE = Federal Endangered; SP = Alabama Protected.

Sources: ANHP (Tracking List), 2019; Easterwood, 2017; Godwin and Hilton, 1995; Federal Register/Vol.77, No.49, March 13, 2012, 50 CFR Part 17.

Appendix C

Past, Present, and Reasonably Foreseeable Future Projects

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Table C-1
Current and Proposed Future Development Projects in the Alternative Analysis Areas

No.	Project Name	Project Proponent	Timeframe	Resource Interaction	Project Description
Buckley AFB					
1	New Recreational Facilities and Improvements	DoD	Future	• Hazardous Materials and Waste • Socioeconomics • Air Quality • Biological Resources • Cultural Resources • Water Resources	Development of recreational facilities and improvements at Buckley AFB include a new community activity center (24,128 square feet); development of a new athletic park (445,220 square feet) with a running track and softball fields; extension of an existing walking/jogging trail (2,885 linear feet); and development of a new walking/jogging trail (53,490 linear feet). Development of the athletic park would require the demolition of an existing running track and softball fields prior to construction.
2	Transportation Improvements	DoD; City of Aurora	Past/Present; Present; Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	Traffic and parking improvement projects at Buckley AFB include new parking space to improve existing parking deficiencies, road expansions to increase traffic capacity, new access control points, and median construction. Many of these projects have already begun, and are currently under construction, with the exception of the new Sixth Avenue entry gate, which is proposed for future construction. More than 11,000 linear feet of roadways would be updated and expanded, while more than 230,000 square feet of parking space would be renovated. Outside the installation, the City of Aurora is extending the Stephen D. Hogan Parkway (Sixth Avenue Parkway) to connect East Sixth Avenue to the E-470 Tollway. In addition to the extended two-lane roadway, the project also would build a new roadway bridge over Sand Creek, modify a section of the Triple Creek Trail, and construct two new intersections at Picadilly Road and State Highway 30. The project will be completed in fall 2019.

Table C-1
Current and Proposed Future Development Projects in the Alternative Analysis Areas

No.	Project Name	Project Proponent	Timeframe	Resource Interaction	Project Description
3	Airfield Improvements	DoD	Present	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	There are several airfield improvement projects at Buckley AFB that involve the construction of taxiways, a hangar, and a hot cargo pad. These projects would replace outdated facilities and provide adequate space for mission requirements. A total of approximately 558,000 square feet of new taxiways would be built. The new hangar would be 73,868 square feet. Approximately 177,704 square feet of new pavement would be required to support the hot cargo pad. These projects are currently under construction.
4	Utility and Energy Improvements	DoD	Future	• Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	A new 50-megawatt substation is proposed to accommodate future facility requirements on Buckley AFB. The new substation would encompass approximately 217,800 square feet (5 acres). Construction activities would begin in 2020.
5	Development of Administrative and Operational Facilities	DoD	Present; Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Biological Resources • Cultural Resources • Water Resources	Eleven projects are planned at Buckley AFB to redevelop or build new administrative and operational facilities to support mission readiness. These projects include new storage facilities; the new SBIRS Operational Facility; the new 112,000-square feet NEXTGEN MCS facility; a consolidated fire station; expansion of the existing medical facility; a small arms range complex; and a mixed-use retail and administrative building. Over 39,000 square feet of existing buildings would be demolished to accommodate new development. Demolition activities have already started, and are anticipated to be completed after 2019. The SBIRS facility is currently under construction, and is slated for a 2023 completion; construction of the small arms range was recently completed. New construction would take place between 2020 and 2024.

Table C-1
Current and Proposed Future Development Projects in the Alternative Analysis Areas

No.	Project Name	Project Proponent	Timeframe	Resource Interaction	Project Description
6	Commercial and Mixed-Use Development	Private Developers	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Biological Resources • Cultural Resources • Water Resources	Citadel on Colfax is a 20-acre mixed-use development expected to be completed by end of 2019. The development would be on Colfax Avenue near Chambers Road. It would include an extended-stay hotel, restaurants, retail stores, and town homes.
Peterson AFB					
7	Development of Administrative and Operational Facilities	DoD	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Biological Resources • Cultural Resources • Water Resources	Two administrative and facility projects are proposed at Peterson AFB, including development of a two-story Colorado Army National Guard (COARNG) facility, east of the existing softball fields; and a two-story Special Operations Command (SOCNORTH) facility, southeast of Building 3. Total project footprint would be 50,000 square feet for both projects.
8	Transportation Improvements	City of Colorado Springs	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	In Colorado Springs, paving projects are scheduled in 2019 to repair Sand Creek Drive off of Airport Road and Chelton Road from Fountain Boulevard to Academy Boulevard. Pikes Peak Avenue (between Colorado Avenue to Printers Parkway), a 2-year reconstruction project, is currently in the final paving stage and will be completed in 2019.
9	Residential Developments	City of Colorado Springs and Private Developers	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	New residential developments in downtown Colorado Springs include Casa Mundi (27 residential units) and Park Manor East Apartments (20 units).

Table C-1
Current and Proposed Future Development Projects in the Alternative Analysis Areas

No.	Project Name	Project Proponent	Timeframe	Resource Interaction	Project Description
Schriever AFB					
10	Utility and Energy Improvements	DoD	Present/Future; Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	Utility improvements at Schriever AFB include the demolition of an existing wastewater lagoon and the replacement of existing water distribution, sanitary sewer, and chilled water distribution pipes throughout the installation. Approximately 81,000 linear feet of pipes within existing rights-of-way would be replaced, resulting in approximately 840,000 square feet of disturbance. The wastewater lagoon encompasses approximately 1 acre, with a capacity of 500,000 gallons. The lagoon liner would be removed and the area would be filled with clean fill.
11	Development of Administrative and Operational Facilities	DoD	Present; Present/Future; Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Biological Resources • Cultural Resources • Water Resources	Approximately 10 projects are planned at Schriever AFB to redevelop or build new administrative and operational facilities to support mission readiness. These projects include facility expansions, new structures, expansion of a fire training area, and establishment of a contractor staging area. The fire training area would be expanded to the south by approximately 160,000 square feet (3.5 acres); the area would be graded and covered with gravel to support driver training for fire equipment and Security Forces All Terrain Vehicle (ATV) training. New and expanded facilities would total at least 153,883 square feet to support 310 Space Wing Operations, 50th Force Support Squadron, and overall installation security forces. Buildings would be one to two stories in height. The contractor staging area would cover an area of approximately 81,000 square feet, and include stalls, access lanes, gravel yards, and perimeter and stall fencing. The contractor staging area would be south of Building 805 and east of the recreational vehicle (RV) parking area.

Table C-1
Current and Proposed Future Development Projects in the Alternative Analysis Areas

No.	Project Name	Project Proponent	Timeframe	Resource Interaction	Project Description
12	Transportation Improvements	DoD; Colorado Department of Transportation (CDOT)	Present/Future; Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	Several transportation improvement projects are proposed at Schriever AFB, including construction of a roundabout at Enoch Road and Falcon Parkway; re-surfacing 58,000 linear feet of the existing perimeter road; and construction of two pedestrian bridges totaling 1,400 linear feet. As part of the roundabout construction, curbs and gutters would be designed to allow for existing stormwater systems to be used; a culvert may be installed for the proposed leg headed to the west, where no development currently exists. Creation of the two pedestrian bridges would involve installation of box culverts with a walkway crosswalk, flashing light pedestrian crossing signs, overhead lighting fixtures, and handrails. Area disturbance is estimated to be less than 16 acres for these projects. In addition, the CDOT proposes to widen Highway 94 and incorporate safety improvements.
13	Development of Community Services	DoD	Present/Future; Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Biological Resources • Cultural Resources • Water Resources	New development projects are proposed at Schriever AFB in support of new and existing community services. The expansion of Building 220 would add approximately 8,746 square feet of space to accommodate additional medical and dental clinic functions. A new 20,197-square feet fire station would be built on the northwestern corner of Falcon Parkway and Enoch Road to service the installation's fire and emergency needs. In addition, a new 10,000-square feet education center would provide support to the existing Child Development Center. Total area disturbance for these projects would be less than 3 acres.

Table C-1
Current and Proposed Future Development Projects in the Alternative Analysis Areas

No.	Project Name	Project Proponent	Timeframe	Resource Interaction	Project Description
Vandenberg AFB					
14	Development of Administrative and Operational Facilities	DoD	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Biological Resources • Cultural Resources • Water Resources	Vandenberg AFB has a total of 68 facility development projects proposed under the Installation Development Plan. These projects primarily focus on space optimization and right-sizing facilities to replace substandard and aging facilities. Of note are a golf course expansion project and development of the Blue Origin Launch Complex. Construction activities include renovations, facility additions, and new construction. Of these projects, 44 projects are identified for short-range completion (1 to 5 years), while 8 are proposed for mid-range completion (6 to 10 years), and 11 are proposed for long-range completion (11+ years). These projects would occur throughout the installation. There also are three short-range, three mid-range, and one long-range projects proposed at the installation to support current and future spacelift missions.
15	Airfield Improvements	DoD	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	Five projects (four short-range and one mid-range) are proposed in the Airfield District at Vandenberg AFB. These projects focus primarily on maintaining capability and compliance with airfield UFC standards. Projects include runway, taxiway, and parking ramp improvements, and replacing the air traffic control tower.
16	Transportation Improvements	DoD	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	Eleven transportation improvement projects (six short-range, three mid-range, and two long-range) are planned to assist in maximizing available land resources and improving the performance of existing traffic flow at Vandenberg AFB. These projects include roadway, parking, and rail improvements throughout the installation.

Table C-1
Current and Proposed Future Development Projects in the Alternative Analysis Areas

No.	Project Name	Project Proponent	Timeframe	Resource Interaction	Project Description
17	Utility and Energy Improvements	DoD	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	Utility and energy projects proposed at Vandenberg AFB focus on energy conservation and sustainability projects, and system enhancements and extensions. A total of 21 short-range projects, two mid-range projects, and three long-range projects are proposed throughout the installation. These projects include overhead and underground distribution line repairs and replacements, electric grid updates, and routine sustainment, restoration, and modernization of the utility infrastructure systems.
18	Residential Development	City of Lompoc and Private Developers	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	Residential projects outside of the installation include the development of Summit View Homes, Mosaic Walk, River Terrace, Burton Ranch, and Coastal Meadows, which would provide over 730 new housing units in the City of Lompoc.
Redstone Arsenal					
19	Development of Administrative and Operational Facilities	DoD	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Biological Resources • Cultural Resources • Water Resources	Eighteen new construction projects totaling over 950,000 square feet are proposed for development at Redstone Arsenal. These projects are new facilities to support various commands and groups on the installation, including the Aviation Missile Command, Space and Missile Defense Command, Missile Defense Agency, Federal Bureau of Investigations, Redstone Test Center, and the Garrison. Facilities include new office buildings, command centers, research labs, an explosives cargo apron, storage buildings, and a landing pad. Over 4,200 additional personnel would staff these new facilities.

Table C-1
Current and Proposed Future Development Projects in the Alternative Analysis Areas

No.	Project Name	Project Proponent	Timeframe	Resource Interaction	Project Description
20	Transportation Improvements	Alabama Department of Transportation (ALDOT); City of Huntsville	Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Water Resources	Off the installation, ALDOT and the City of Huntsville propose several transportation improvement projects. SR-255 would be expanded between University Drive and Old Madison Pike to create additional lanes, a new bridge, and cyclist/pedestrian paths. This project would begin in mid-2019, with final completion in late 2021. Four bridge widenings and resurfacing efforts are proposed for I-565. In addition, widening efforts on Zierdt Road from Madison Boulevard to Martin Road are under way. Widening for Martin Road/James Record Road began in 2018, and modification of the Resolute Way Interchange is scheduled to begin in 2025.

Table C-1
Current and Proposed Future Development Projects in the Alternative Analysis Areas

No.	Project Name	Project Proponent	Timeframe	Resource Interaction	Project Description
21	Mixed-Use Development	City of Huntsville and Private Developers	Present; Future	• Transportation • Hazardous Materials and Waste • Socioeconomics • Air Quality • Biological Resources • Cultural Resources • Water Resources	Several mixed-use developments are under way in Huntsville. The Hays Farm project will include over 1,000 new housing units composing of a mix of single-family homes and condos, in addition to retail space and restaurants on 850 acres in south Huntsville. The development will include 500 acres of greenspace (trails, ballfields, woods, lakes, and parks). Haysland Road will be extended from South Memorial Parkway through the development to Hobbs Road, a couple hundred yards east of Redstone Arsenal's Gate 3. The project is currently under construction. Expansion of the Von Braun Center also is under construction, and would include a new music venue, restaurant area, and a 35,000-square feet convention center. CityCentre at Big Spring is a $100 million future development comprising 30,000 square feet of retail and restaurant space, 277 apartment units, and a food hall. In addition, the Redstone Gateway project proposes to develop a mixed-use community on a 468-acre site, composing of office, research and development, data, and retail space. The project is composed of 575,000 square feet of existing office space, 19,000 square feet of existing retail space, 650,000 of square feet under construction, and up to 300,000 square feet scheduled for construction in the near-term. An additional 3.3 million square feet are available for additional development capability. The development will be right outside of Redstone Arsenal Gate 9.

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Appendix D

Representative Permitting Requirements

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Table D-1
Representative Federal, State, and Local Permits, Licenses, and Entitlements

Federal Permit, License, or Entitlement	Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement	Authority	Regulatory Agency
Clean Air Act (CAA) Title V permit	Any major sources (sources that emits more than 100 tons per year of criteria pollutant in a nonattainment area for that pollutant or is otherwise defined in Title I of CAA as a major source); affected sources as defined in Title IV of CAA; sources subject to Section 111 regarding New Source Performance Standards; sources of air toxics regulated under Section 112 of CAA; sources required to have new source or modification permits under Parts C or D of Title I of CAA; and any other source designated by U.S. Environmental Protection Agency regulations.	Title V of CAA, as amended by the 1990 CAA Amendments, Title V of CAA	U.S. Environmental Protection Agency
National Pollutant Discharge Elimination System (NPDES) permit	Discharge of pollutant from any point source into waters of the United States.	Section 402 of Clean Water Act, 33 USC Section 1342	U.S. Environmental Protection Agency
Section 404 (Dredge and Fill) permit	Any project activities resulting in the discharge of dredged or fill material into bodies of water, including wetlands, within the United States.	Section 404 of Clean Water Act, 33 USC Section 1344	U.S. Department of Defense – Army Corps of Engineers, in consultation with U.S. Environmental Protection Agency
Hazardous waste treatment, storage, or disposal (TSD) facility permit	Owners or operators of a new or existing hazardous waste TSD facility.	Resource Conservation and Recovery Act (RCRA) as amended, 42 USC Section 6901; 40 CFR 270	U.S. Environmental Protection Agency
U.S. Environmental Protection Agency identification number	Generators or transporters (off-site transport) of hazardous waste.	40 CFR 262.10 (generators); 40 CFR 263, Subpart B (transporters)	U.S. Environmental Protection Agency
Archaeological Resources Protection Act permit	Excavation and/or removal of archaeological resources from public lands or Indian lands, and carrying out	Archaeological Resource Protection Act of 1979, 16 USC Section 470cc	U.S. Department of the Interior – National Park Service

Table D-1
Representative Federal, State, and Local Permits, Licenses, and Entitlements

Federal Permit, License, or Entitlement	Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement	Authority	Regulatory Agency
	activities associated with such excavation and/or removal.		
Endangered Species Act Section 10 permit	Taking endangered or threatened wildlife species; engaging in certain commercial trade of endangered or threatened plants or removing such plants on property subject to federal jurisdiction.	Section 10 of Endangered Species Act, 16 USC Section 1539; 50 CFR 17 Subparts C, D, F, and G	U.S. Department of the Interior – Fish and Wildlife Service
State and Local Permits			
Construction Activity and Discharge Permit	Stormwater discharges associated with construction activities are regulated, as well as the submission of an Air Pollutant Emissions Notice for fugitive dust emissions associated with land disturbance.	COR400000	Colorado Department of Public Health and the Environment
Project Permit for Construction Activities	Demolition or dismantling of a building or structure more than 36 feet in height; building or erecting a structure intended to be more than 36 feet in height when completed; and constructing a trench or an excavation 5 feet or deeper in which any person will be required to descend.	Cal/OSHA Title 8 regulations, section 341.1	California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA)
Construction General Permit	Dischargers whose projects **disturb 1 or more acres of soil or** whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity. The Construction General Permit requires	Construction General Permit Order 2009-0009-DWQ	California Environmental Protection Agency, State Water Resources Control Board

Table D-1
Representative Federal, State, and Local Permits, Licenses, and Entitlements

Federal Permit, License, or Entitlement	Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement	Authority	Regulatory Agency
	the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer.		
Construction General Permit	Permit for discharges associated with regulated construction activity that will result in land disturbance equal to or greater than 1 acre or from construction activities involving less than 1 acre and which are part of a common plan of development or sale equal to or greater than 1 acre.	General NPDES Permit No. ALR100000	Alabama Department of Environmental Management
County Building Permits	Building permits required for demolition of new building construction.	Applicable State authorities	El Paso and Arapahoe counties, Colorado; County of Santa Barbara, California; and Madison County, Alabama
Construction and Operating Permits	Construction and operating permits for installation and operation of specific types of equipment or processes (generators, boilers).	Santa Barbara County Air Pollution Control District Rule 201	Santa Barbara County Air Pollution Control District

CAA = Clean Air Act
CFR = Code of Federal Regulations
NPDES = National Pollutant Discharge Elimination System
RCRA = Resource Conservation and Recovery Act
TSD = treatment, storage, or disposal
USC = United States Code

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Appendix E

Air Emissions Reports

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Buckley AFB Air Emissions Report

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DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: BUCKLEY AFB
State: Colorado
County(s): Arapahoe
Regulatory Area(s): Denver Metro, CO; Denver-Boulder, CO; Denver-Boulder-Greeley-Ft Collins-Loveland, CO; Denver Metro/North Front Range, CO

- Action Title: United States Space Command (USSPACECOM)

- Project Number/s (if applicable):

- Projected Action Start Date: 10 / 2019

- Action Purpose and Need:

The purpose of the Proposed Action is to further enact these recommendations by establishing a permanent operational USSPACECOM headquarters as a functional combatant command.

- Action Description:

A USSPACECOM headquarters would be established at one of five alternative locations, which include four AFBs and the Redstone Arsenal. Existing, vacant facilities and/or temporary/modular facilities would be used in the interim until the permanent headquarters facility is operational. USSPACECOM is expected to require permanent facility construction to accommodate approximately 1,870 personnel in a typical headquarters setting.

- Point of Contact

Name: Caitlin Shaw
Title: Contractor
Organization: AECOM
Email:
Phone Number:

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Denver Metro, CO			
VOC	0.549		
NOx	1.673		
CO	5.011		
SOx	0.006		
PM 10	6.107	100	No
PM 2.5	0.067		
Pb	0.000		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

NH3	0.024		
CO2e	700.8		
Denver-Boulder, CO			
VOC	0.549		
NOx	1.673		
CO	5.011	100	No
SOx	0.006		
PM 10	6.107		
PM 2.5	0.067		
Pb	0.000		
NH3	0.024		
CO2e	700.8		
Denver-Boulder-Greeley-Ft Collins-Loveland, CO			
VOC	0.549	100	No
NOx	1.673	100	No
CO	5.011		
SOx	0.006		
PM 10	6.107		
PM 2.5	0.067		
Pb	0.000		
NH3	0.024		
CO2e	700.8		
Denver Metro/North Front Range, CO			
VOC	0.549	100	No
NOx	1.673	100	No
CO	5.011		
SOx	0.006		
PM 10	6.107		
PM 2.5	0.067		
Pb	0.000		
NH3	0.024		
CO2e	700.8		

2020

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Denver Metro, CO			
VOC	4.511		
NOx	5.003		
CO	49.325		
SOx	0.037		
PM 10	0.187	100	No
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		
Denver-Boulder, CO			
VOC	4.511		
NOx	5.003		
CO	49.325	100	No
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

NH3	0.269		
CO2e	5128.6		
Denver-Boulder-Greeley-Ft Collins-Loveland, CO			
VOC	4.511	100	No
NOx	5.003	100	No
CO	49.325		
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		
Denver Metro/North Front Range, CO			
VOC	4.511	100	No
NOx	5.003	100	No
CO	49.325		
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		

2021

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Denver Metro, CO			
VOC	5.859		
NOx	14.857		
CO	56.759		
SOx	0.062		
PM 10	53.348	100	No
PM 2.5	0.546		
Pb	0.000		
NH3	0.291		
CO2e	7709.2		
Denver-Boulder, CO			
VOC	5.859		
NOx	14.857		
CO	56.759	100	No
SOx	0.062		
PM 10	53.348		
PM 2.5	0.546		
Pb	0.000		
NH3	0.291		
CO2e	7709.2		
Denver-Boulder-Greeley-Ft Collins-Loveland, CO			
VOC	5.859	100	No
NOx	14.857	100	No
CO	56.759		
SOx	0.062		
PM 10	53.348		
PM 2.5	0.546		
Pb	0.000		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

NH3	0.291		
CO2e	7709.2		
Denver Metro/North Front Range, CO			
VOC	5.859	100	No
NOx	14.857	100	No
CO	56.759		
SOx	0.062		
PM 10	53.348		
PM 2.5	0.546		
Pb	0.000		
NH3	0.291		
CO2e	7709.2		

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Denver Metro, CO			
VOC	4.511		
NOx	5.003		
CO	49.325		
SOx	0.037		
PM 10	0.187	100	No
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		
Denver-Boulder, CO			
VOC	4.511		
NOx	5.003		
CO	49.325	100	No
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		
Denver-Boulder-Greeley-Ft Collins-Loveland, CO			
VOC	4.511	100	No
NOx	5.003	100	No
CO	49.325		
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		
Denver Metro/North Front Range, CO			
VOC	4.511	100	No
NOx	5.003	100	No
CO	49.325		
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		

NH3	0.269		
CO2e	5128.6		

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Denver Metro, CO			
VOC	4.556		
NOx	5.177		
CO	49.508		
SOx	0.038		
PM 10	0.196	100	No
PM 2.5	0.185		
Pb	0.000		
NH3	0.270		
CO2e	5166.0		
Denver-Boulder, CO			
VOC	4.556		
NOx	5.177		
CO	49.508	100	No
SOx	0.038		
PM 10	0.196		
PM 2.5	0.185		
Pb	0.000		
NH3	0.270		
CO2e	5166.0		
Denver-Boulder-Greeley-Ft Collins-Loveland, CO			
VOC	4.556	100	No
NOx	5.177	100	No
CO	49.508		
SOx	0.038		
PM 10	0.196		
PM 2.5	0.185		
Pb	0.000		
NH3	0.270		
CO2e	5166.0		
Denver Metro/North Front Range, CO			
VOC	4.556	100	No
NOx	5.177	100	No
CO	49.508		
SOx	0.038		
PM 10	0.196		
PM 2.5	0.185		
Pb	0.000		
NH3	0.270		
CO2e	5166.0		

2024

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Denver Metro, CO			
VOC	4.539		
NOx	5.522		
CO	49.761		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

SOx	0.041		
PM 10	0.226	100	No
PM 2.5	0.215		
Pb	0.000		
NH3	0.269		
CO2e	5752.7		
Denver-Boulder, CO			
VOC	4.539		
NOx	5.522		
CO	49.761	100	No
SOx	0.041		
PM 10	0.226		
PM 2.5	0.215		
Pb	0.000		
NH3	0.269		
CO2e	5752.7		
Denver-Boulder-Greeley-Ft Collins-Loveland, CO			
VOC	4.539	100	No
NOx	5.522	100	No
CO	49.761		
SOx	0.041		
PM 10	0.226		
PM 2.5	0.215		
Pb	0.000		
NH3	0.269		
CO2e	5752.7		
Denver Metro/North Front Range, CO			
VOC	4.539	100	No
NOx	5.522	100	No
CO	49.761		
SOx	0.041		
PM 10	0.226		
PM 2.5	0.215		
Pb	0.000		
NH3	0.269		
CO2e	5752.7		

2025 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Denver Metro, CO			
VOC	4.571		
NOx	6.095		
CO	50.243		
SOx	0.044		
PM 10	0.270	100	No
PM 2.5	0.258		
Pb	0.000		
NH3	0.269		
CO2e	6443.3		
Denver-Boulder, CO			
VOC	4.571		
NOx	6.095		
CO	50.243	100	No

SOx	0.044		
PM 10	0.270		
PM 2.5	0.258		
Pb	0.000		
NH3	0.269		
CO2e	6443.3		
Denver-Boulder-Greeley-Ft Collins-Loveland, CO			
VOC	4.571	100	No
NOx	6.095	100	No
CO	50.243		
SOx	0.044		
PM 10	0.270		
PM 2.5	0.258		
Pb	0.000		
NH3	0.269		
CO2e	6443.3		
Denver Metro/North Front Range, CO			
VOC	4.571	100	No
NOx	6.095	100	No
CO	50.243		
SOx	0.044		
PM 10	0.270		
PM 2.5	0.258		
Pb	0.000		
NH3	0.269		
CO2e	6443.3		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Construction of Phase 1 Interim Facilities
3.	Personnel	Operations Personnel for Interim and Permament Facilities.
4.	Heating	Heating of Interim Facilities
5.	Emergency Generator	Emergancy Generator for Interim and Permanent Facilities
6.	Construction / Demolition	Construction of Permanent Facilities
7.	Heating	Heating of Permanent Facilities

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location

County: Arapahoe

Regulatory Area(s): Denver Metro, CO; Denver-Boulder, CO; Denver-Boulder-Greeley-Ft Collins-Loveland, CO; Denver Metro/North Front Range, CO

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Title: Construction of Phase 1 Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 10
Start Month: 2019

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2019

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.173461
SO_x	0.002679
NO_x	1.256405
CO	0.900894
PM 10	6.091592

Pollutant	Total Emissions (TONs)
PM 2.5	0.052368
Pb	0.000000
NH_3	0.001796
CO_2e	273.4

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 595000
Amount of Material to be Hauled On-Site (yd^3): 11167
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8

Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 193000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Arapahoe
Regulatory Area(s): Denver Metro, CO; Denver-Boulder, CO; Denver-Boulder-Greeley-Ft Collins-Loveland, CO; Denver Metro/North Front Range, CO

- Activity Title: Operations Personnel for Interim and Permament Facilities.

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	4.463162
SO_x	0.028158
NO_x	4.220065
CO	48.671375
PM 10	0.123927

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.112620
Pb	0.000000
NH_3	0.269276
CO_2e	4210.9

3.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 748
Civilian Personnel: 1103
Support Contractor Personnel: 19
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule

Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year

$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Heating

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Arapahoe
Regulatory Area(s): Denver Metro, CO; Denver-Boulder, CO; Denver-Boulder-Greeley-Ft Collins-Loveland, CO; Denver Metro/North Front Range, CO

- Activity Title: Heating of Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 8
End Year: 2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.198564
SO_x	0.021661
NO_x	3.610249
CO	3.032609
PM 10	0.274379

Pollutant	Total Emissions (TONs)
PM 2.5	0.274379
Pb	0.000000
NH_3	0.000000
CO_2e	4346.4

4.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 193000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0827

- Default Settings Used: Yes

- Boiler/Furnace Usage

Operating Time Per Year (hours): 900 (default)

4.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

4.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year

FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

5. Emergency Generator

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Arapahoe
Regulatory Area(s): Denver Metro, CO; Denver-Boulder, CO; Denver-Boulder-Greeley-Ft Collins-Loveland, CO; Denver Metro/North Front Range, CO

- Activity Title: Emergancy Generator for Interim and Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.005650
SO_x	0.004759
NO_x	0.023288
CO	0.015552
PM 10	0.005083

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.005083
Pb	0.000000
NH_3	0.000000
CO_2e	2.7

5.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 1

- Default Settings Used: Yes

- Emergency Generators Consumption
Emergency Generator's Horsepower: 135 (default)
Average Operating Hours Per Year (hours): 30 (default)

5.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

5.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: Arapahoe
Regulatory Area(s): Denver Metro, CO; Denver-Boulder, CO; Denver-Boulder-Greeley-Ft Collins-Loveland, CO; Denver Metro/North Front Range, CO

- Activity Title: Construction of Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 1
Start Month: 2021

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.393754
SO_x	0.025222
NO_x	10.027379
CO	7.616189
PM 10	53.170595

Pollutant	Total Emissions (TONs)
PM 2.5	0.380188
Pb	0.000000
NH_3	0.022191
CO_2e	2617.9

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 6
Number of Days: 12

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 826600
Amount of Material to be Hauled On-Site (yd^3): 18350
Amount of Material to be Hauled Off-Site (yd^3): 50000

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC

POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Trenching/Excavating Phase

6.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2021

- Phase Duration

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Month: 1
Number of Days: 18

6.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 2000
Amount of Material to be Hauled Off-Site (yd^3): 2000

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.3 Building Construction Phase

6.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 12
Number of Days: 0

6.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 498000
Height of Building (ft): 70
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

6.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0845	0.0013	0.6033	0.3865	0.0228	0.0228	0.0076	128.82
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0293	0.0006	0.1458	0.2148	0.0056	0.0056	0.0026	54.462
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0362	0.0006	0.2977	0.2707	0.0130	0.0130	0.0032	61.074
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0280	0.0003	0.1634	0.1787	0.0088	0.0088	0.0025	25.665

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.4 Paving Phase

6.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 1
Number of Days: 0

6.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 581400

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
VOC_P = (2.62 * PA) / 43560

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

7. Heating

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Arapahoe
Regulatory Area(s): Denver Metro, CO; Denver-Boulder, CO; Denver-Boulder-Greeley-Ft Collins-Loveland, CO; Denver Metro/North Front Range, CO

- Activity Title: Heating of Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 8
Start Year: 2024

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)

VOC	0.101865		PM 2.5	0.140759
SO_x	0.011113		Pb	0.000000
NO_x	1.852086		NH_3	0.000000
CO	1.555752		CO_2e	2229.7
PM 10	0.140759			

7.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 498000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0781

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

7.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

7.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBTU/ft^3)
1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

Peterson AFB Air Emissions Report

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DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: PETERSEN AFB
State: Colorado
County(s): El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Action Title: United States Space Command (USSPACECOM)

- Project Number/s (if applicable):

- Projected Action Start Date: 10 / 2019

- Action Purpose and Need:

The purpose of the Proposed Action is to further enact these recommendations by establishing a permanent operational USSPACECOM headquarters as a functional combatant command.

- Action Description:

A USSPACECOM headquarters would be established at one of five alternative locations, which include four AFBs and the Redstone Arsenal. Existing, vacant facilities and/or temporary/modular facilities would be used in the interim until the permanent headquarters facility is operational. USSPACECOM is expected to require permanent facility construction to accommodate approximately 1,870 personnel in a typical headquarters setting.

- Point of Contact

Name: Caitlin Shaw
Title: Contractor
Organization: AECOM
Email:
Phone Number:

2. Analysis:

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the “worst-case” and “steady state” (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.549		
NOx	1.673		
CO	5.011		
SOx	0.006		
PM 10	6.107		
PM 2.5	0.067		
Pb	0.000		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

NH3	0.024		
CO2e	700.8		
Colorado Springs, CO			
VOC	0.549		
NOx	1.673		
CO	5.011	100	No
SOx	0.006		
PM 10	6.107		
PM 2.5	0.067		
Pb	0.000		
NH3	0.024		
CO2e	700.8		

2020

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.511		
NOx	5.003		
CO	49.325		
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		
Colorado Springs, CO			
VOC	4.511		
NOx	5.003		
CO	49.325	100	No
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		

2021

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.939		
NOx	15.503		
CO	57.138		
SOx	0.064		
PM 10	21.421		
PM 2.5	0.570		
Pb	0.000		
NH3	0.294		
CO2e	7875.2		
Colorado Springs, CO			
VOC	5.939		
NOx	15.503		
CO	57.138	100	No

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

SOx	0.064		
PM 10	21.421		
PM 2.5	0.570		
Pb	0.000		
NH3	0.294		
CO2e	7875.2		

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.511		
NOx	5.003		
CO	49.325		
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		
Colorado Springs, CO			
VOC	4.511		
NOx	5.003		
CO	49.325	100	No
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.519		
NOx	5.039		
CO	49.368		
SOx	0.038		
PM 10	0.189		
PM 2.5	0.177		
Pb	0.000		
NH3	0.269		
CO2e	5136.5		
Colorado Springs, CO			
VOC	4.519		
NOx	5.039		
CO	49.368	100	No
SOx	0.038		
PM 10	0.189		
PM 2.5	0.177		
Pb	0.000		
NH3	0.269		
CO2e	5136.5		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2024

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.539		
NOx	5.522		
CO	49.761		
SOx	0.041		
PM 10	0.226		
PM 2.5	0.215		
Pb	0.000		
NH3	0.269		
CO2e	5752.7		
Colorado Springs, CO			
VOC	4.539		
NOx	5.522		
CO	49.761	100	No
SOx	0.041		
PM 10	0.226		
PM 2.5	0.215		
Pb	0.000		
NH3	0.269		
CO2e	5752.7		

2025 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.571		
NOx	6.095		
CO	50.243		
SOx	0.044		
PM 10	0.270		
PM 2.5	0.258		
Pb	0.000		
NH3	0.269		
CO2e	6443.3		
Colorado Springs, CO			
VOC	4.571		
NOx	6.095		
CO	50.243	100	No
SOx	0.044		
PM 10	0.270		
PM 2.5	0.258		
Pb	0.000		
NH3	0.269		
CO2e	6443.3		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

- Activity List:

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Activity Type		Activity Title
2.	Construction / Demolition	Construction of Phase 1 Interim Facilities
3.	Personnel	Operations Personnel for Interim and Permament Facilities.
4.	Heating	Heating of Interim Facilities
5.	Emergency Generator	Emergancy Generator for Interim and Permanent Facilities
6.	Construction / Demolition	Construction of Permanent Facilities at Peterson AFB
7.	Heating	Heating of Permanent Facilities
8.	Construction / Demolition	Construction of Parking Structures at Peterson AFB

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Construction of Phase 1 Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 10
Start Month: 2019

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2019

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.173461
SO_x	0.002679
NO_x	1.256405
CO	0.900894
PM 10	6.091592

Pollutant	Total Emissions (TONs)
PM 2.5	0.052368
Pb	0.000000
NH_3	0.001796
CO_2e	273.4

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2019

- Phase Duration

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Month: 1
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft^2): 595000
Amount of Material to be Hauled On-Site (yd^3): 11167
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Duration
Number of Month: 1
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 193000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Operations Personnel for Interim and Permament Facilities.

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	4.463162
SO_x	0.028158
NO_x	4.220065
CO	48.671375
PM 10	0.123927

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.112620
Pb	0.000000
NH_3	0.269276
CO_2e	4210.9

3.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 748
Civilian Personnel: 1103
Support Contractor Personnel: 19
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule

Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year
$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Heating

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Heating of Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 8
End Year: 2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.198564
SO_x	0.021661
NO_x	3.610249

Pollutant	Total Emissions (TONs)
PM 2.5	0.274379
Pb	0.000000
NH_3	0.000000

CO	3.032609		CO_2e	4346.4
PM 10	0.274379			

4.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 193000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0827

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

4.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

4.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
$FC_{HER} = HA * EI / HV / 1000000$

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBTU/ft^3)
1000000: Conversion Factor

- Heating Emissions per Year
$HE_{POL} = FC * EF_{POL} / 2000$

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

5. Emergency Generator

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Emergancy Generator for Interim and Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.005650
SO_x	0.004759
NO_x	0.023288
CO	0.015552
PM 10	0.005083

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.005083
Pb	0.000000
NH_3	0.000000
CO_2e	2.7

5.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 1

- Default Settings Used: Yes

- Emergency Generators Consumption
Emergency Generator's Horsepower: 135 (default)
Average Operating Hours Per Year (hours): 30 (default)

5.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

5.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Construction of Permanent Facilities at Peterson AFB

- Activity Description:

- Activity Start Date
Start Month: 1
Start Month: 2021

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.320107
SO_x	0.024240
NO_x	9.636752
CO	7.184886
PM 10	21.200979

Pollutant	Total Emissions (TONs)
PM 2.5	0.362439
Pb	0.000000
NH_3	0.021486
CO_2e	2517.9

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 6
Number of Days: 12

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 324400
Amount of Material to be Hauled On-Site (yd^3): 4400
Amount of Material to be Hauled Off-Site (yd^3): 50000

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722

HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Trenching/Excavating Phase

6.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 1
Number of Days: 18

6.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 2000
Amount of Material to be Hauled Off-Site (yd^3): 2000

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.3 Building Construction Phase

6.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 12
Number of Days: 0

6.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 498000
Height of Building (ft): 70
Number of Units: N/A

- Building Construction Default Settings

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

6.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0845	0.0013	0.6033	0.3865	0.0228	0.0228	0.0076	128.82
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0293	0.0006	0.1458	0.2148	0.0056	0.0056	0.0026	54.462
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0362	0.0006	0.2977	0.2707	0.0130	0.0130	0.0032	61.074
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0280	0.0003	0.1634	0.1787	0.0088	0.0088	0.0025	25.665

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e

LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = BA * BH * (0.42 / 1000) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.4 Paving Phase

6.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 0
Number of Days: 7

6.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 79200

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	2	6
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC

POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
VOC_P = (2.62 * PA) / 43560

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

7. Heating

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Title: Heating of Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 8
Start Year: 2024

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.101865
SO_x	0.011113
NO_x	1.852086
CO	1.555752
PM 10	0.140759

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.140759
Pb	0.000000
NH_3	0.000000
CO_2e	2229.7

7.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 498000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0781

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

7.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

7.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year

FC_{HER} = HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBTU/ft^3)

1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

8. Construction / Demolition

8.1 General Information & Timeline Assumptions

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Construction of Parking Structures at Peterson AFB

- Activity Description:

- Activity Start Date
Start Month: 1
Start Month: 2021

- Activity End Date
Indefinite: False
End Month: 3
End Month: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.117172
SO_x	0.002251
NO_x	0.898184
CO	0.670121
PM 10	0.034865

Pollutant	Total Emissions (TONs)
PM 2.5	0.033695
Pb	0.000000
NH_3	0.002826
CO_2e	236.6

8.1 Building Construction Phase

8.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 3
Number of Days: 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

8.1.2 Building Construction Phase Assumptions

- General Building Construction Information

Building Category: Office or Industrial
Area of Building (ft^2): 80000
Height of Building (ft): 63
Number of Units: N/A

- Building Construction Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

8.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0845	0.0013	0.6033	0.3865	0.0228	0.0228	0.0076	128.82
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0293	0.0006	0.1458	0.2148	0.0056	0.0056	0.0026	54.462
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0362	0.0006	0.2977	0.2707	0.0130	0.0130	0.0032	61.074

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0280	0.0003	0.1634	0.1787	0.0088	0.0088	0.0025	25.665

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

8.1.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

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Schriever AFB Air Emissions Report

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DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location
Base: SCHRIEVER AFB
State: Colorado
County(s): El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Action Title: United States Space Command (USSPACECOM)

- Project Number/s (if applicable):

- Projected Action Start Date: 10 / 2019

- Action Purpose and Need:
The purpose of the Proposed Action is to further enact these recommendations by establishing a permanent operational USSPACECOM headquarters as a functional combatant command.

- Action Description:
A USSPACECOM headquarters would be established at one of five alternative locations, which include four AFBs and the Redstone Arsenal. Existing, vacant facilities and/or temporary/modular facilities would be used in the interim until the permanent headquarters facility is operational. USSPACECOM is expected to require permanent facility construction to accommodate approximately 1,870 personnel in a typical headquarters setting.

- Point of Contact
Name: Caitlin Shaw
Title: Contractor
Organization: AECOM
Email:
Phone Number:

2. Analysis:

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.549		
NOx	1.673		
CO	5.011		
SOx	0.006		
PM 10	6.107		
PM 2.5	0.067		
Pb	0.000		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

NH3	0.024		
CO2e	700.8		
Colorado Springs, CO			
VOC	0.549		
NOx	1.673		
CO	5.011	100	No
SOx	0.006		
PM 10	6.107		
PM 2.5	0.067		
Pb	0.000		
NH3	0.024		
CO2e	700.8		

2020

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.511		
NOx	5.003		
CO	49.325		
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		
Colorado Springs, CO			
VOC	4.511		
NOx	5.003		
CO	49.325	100	No
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		

2021

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.859		
NOx	14.857		
CO	56.759		
SOx	0.062		
PM 10	53.348		
PM 2.5	0.546		
Pb	0.000		
NH3	0.291		
CO2e	7709.2		
Colorado Springs, CO			
VOC	5.859		
NOx	14.857		
CO	56.759	100	No

SOx	0.062		
PM 10	53.348		
PM 2.5	0.546		
Pb	0.000		
NH3	0.291		
CO2e	7709.2		

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.511		
NOx	5.003		
CO	49.325		
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		
Colorado Springs, CO			
VOC	4.511		
NOx	5.003		
CO	49.325	100	No
SOx	0.037		
PM 10	0.187		
PM 2.5	0.175		
Pb	0.000		
NH3	0.269		
CO2e	5128.6		

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.556		
NOx	5.177		
CO	49.508		
SOx	0.038		
PM 10	0.196		
PM 2.5	0.185		
Pb	0.000		
NH3	0.270		
CO2e	5166.0		
Colorado Springs, CO			
VOC	4.556		
NOx	5.177		
CO	49.508	100	No
SOx	0.038		
PM 10	0.196		
PM 2.5	0.185		
Pb	0.000		
NH3	0.270		
CO2e	5166.0		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2024

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.539		
NOx	5.522		
CO	49.761		
SOx	0.041		
PM 10	0.226		
PM 2.5	0.215		
Pb	0.000		
NH3	0.269		
CO2e	5752.7		
Colorado Springs, CO			
VOC	4.539		
NOx	5.522		
CO	49.761	100	No
SOx	0.041		
PM 10	0.226		
PM 2.5	0.215		
Pb	0.000		
NH3	0.269		
CO2e	5752.7		

2025 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.571		
NOx	6.095		
CO	50.243		
SOx	0.044		
PM 10	0.270		
PM 2.5	0.258		
Pb	0.000		
NH3	0.269		
CO2e	6443.3		
Colorado Springs, CO			
VOC	4.571		
NOx	6.095		
CO	50.243	100	No
SOx	0.044		
PM 10	0.270		
PM 2.5	0.258		
Pb	0.000		
NH3	0.269		
CO2e	6443.3		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Construction of Phase 1 Interim Facilities
3.	Personnel	Operations Personnel for Interim and Permament Facilities.
4.	Heating	Heating of Interim Facilities
5.	Emergency Generator	Emergancy Generator for Interim and Permanent Facilities
6.	Construction / Demolition	Construction of Permanent Facilities
7.	Heating	Heating of Permanent Facilities

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: El Paso
Regulatory Area(s): Colorado Springs, CO; NOT IN A REGULATORY AREA

- Activity Title: Construction of Phase 1 Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 10
Start Month: 2019

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2019

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.173461
SO_x	0.002679
NO_x	1.256405
CO	0.900894
PM 10	6.091592

Pollutant	Total Emissions (TONs)
PM 2.5	0.052368
Pb	0.000000
NH_3	0.001796
CO_2e	273.4

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2019

- Phase Duration

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Number of Month: 1
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft^2): 595000
Amount of Material to be Hauled On-Site (yd^3): 11167
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Duration
Number of Month: 1
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 193000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Operations Personnel for Interim and Permament Facilities.

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	4.463162
SO_x	0.028158
NO_x	4.220065
CO	48.671375
PM 10	0.123927

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.112620
Pb	0.000000
NH_3	0.269276
CO_2e	4210.9

3.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 748
Civilian Personnel: 1103
Support Contractor Personnel: 19
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule

Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.330	000.002	000.266	003.546	000.010	000.009		000.024	00332.803
LDGT	000.401	000.003	000.459	004.868	000.012	000.011		000.025	00429.712
HDGV	000.790	000.005	001.240	017.106	000.029	000.025		000.045	00769.881
LDDV	000.130	000.003	000.143	002.423	000.004	000.004		000.008	00322.099
LDDT	000.300	000.004	000.441	004.480	000.007	000.007		000.008	00463.117
HDDV	000.521	000.013	005.564	001.828	000.193	000.178		000.028	01493.071
MC	002.625	000.003	000.840	013.808	000.029	000.025		000.053	00399.376

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Heating

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Heating of Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 8
End Year: 2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.198564
SO_x	0.021661
NO_x	3.610249

Pollutant	Total Emissions (TONs)
PM 2.5	0.274379
Pb	0.000000
NH_3	0.000000

CO	3.032609		CO_2e	4346.4
PM 10	0.274379			

4.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 193000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0827

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

4.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

4.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBTU/ft^3)
1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

5. Emergency Generator

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Emergancy Generator for Interim and Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.005650
SO_x	0.004759
NO_x	0.023288
CO	0.015552
PM 10	0.005083

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.005083
Pb	0.000000
NH_3	0.000000
CO_2e	2.7

5.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 1

- Default Settings Used: Yes

- Emergency Generators Consumption
Emergency Generator's Horsepower: 135 (default)
Average Operating Hours Per Year (hours): 30 (default)

5.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

5.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Construction of Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 1
Start Month: 2021

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.393754
SO_x	0.025222
NO_x	10.027379
CO	7.616189
PM 10	53.170595

Pollutant	Total Emissions (TONs)
PM 2.5	0.380188
Pb	0.000000
NH_3	0.022191
CO_2e	2617.9

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 6
Number of Days: 12

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 826600
Amount of Material to be Hauled On-Site (yd^3): 18350
Amount of Material to be Hauled Off-Site (yd^3): 50000

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722

HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Trenching/Excavating Phase

6.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 1
Number of Days: 18

6.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 2000
Amount of Material to be Hauled Off-Site (yd^3): 2000

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.3 Building Construction Phase

6.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 12
Number of Days: 0

6.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 498000
Height of Building (ft): 70
Number of Units: N/A

- Building Construction Default Settings

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

6.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0845	0.0013	0.6033	0.3865	0.0228	0.0228	0.0076	128.82
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0293	0.0006	0.1458	0.2148	0.0056	0.0056	0.0026	54.462
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0362	0.0006	0.2977	0.2707	0.0130	0.0130	0.0032	61.074
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0280	0.0003	0.1634	0.1787	0.0088	0.0088	0.0025	25.665

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e

LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.4 Paving Phase

6.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 1
Number of Days: 0

6.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 581400

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.301	000.002	000.232	003.362	000.009	000.008		000.023	00323.384
LDGT	000.363	000.003	000.402	004.534	000.011	000.010		000.024	00417.507
HDGV	000.719	000.005	001.095	015.968	000.026	000.023		000.045	00767.415
LDDV	000.125	000.003	000.135	002.442	000.004	000.004		000.008	00312.138
LDDT	000.268	000.004	000.390	004.199	000.007	000.006		000.008	00443.722
HDDV	000.480	000.013	005.052	001.697	000.168	000.155		000.028	01480.669
MC	002.615	000.003	000.838	013.632	000.029	000.025		000.054	00399.467

6.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre$)^2$ / acre)

7. Heating

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: El Paso
Regulatory Area(s): NOT IN A REGULATORY AREA; Colorado Springs, CO

- Activity Title: Heating of Permanent Facilities

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Description:

- Activity Start Date
Start Month: 8
Start Year: 2024

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.101865
SO_x	0.011113
NO_x	1.852086
CO	1.555752
PM 10	0.140759

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.140759
Pb	0.000000
NH_3	0.000000
CO_2e	2229.7

7.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 498000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0781

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

7.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

7.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBTU/ft^3)
1000000: Conversion Factor

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Heating Emissions per Year

HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

Vandenberg AFB Air Emissions Report

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DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: VANDENBERG AFB
State: California
County(s): Santa Barbara
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: United States Space Command (USSPACECOM)

- Project Number/s (if applicable):

- Projected Action Start Date: 10 / 2019

- Action Purpose and Need:

The purpose of the Proposed Action is to further enact these recommendations by establishing a permanent operational USSPACECOM headquarters as a functional combatant command.

- Action Description:

A USSPACECOM headquarters would be established at one of five alternative locations, which include four AFBs and the Redstone Arsenal. Existing, vacant facilities and/or temporary/modular facilities would be used in the interim until the permanent headquarters facility is operational. USSPACECOM is expected to require permanent facility construction to accommodate approximately 1,870 personnel in a typical headquarters setting.

- Point of Contact

Name: Caitlin Shaw
Title: Contractor
Organization: AECOM
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the “worst-case” and “steady state” (net gain/loss upon action fully implemented) emissions.

“Air Quality Indicators” were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (de minimis levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR de minimis threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an actions emissions within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR de minimis threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.447	100	No
NOx	1.471	100	No
CO	2.792	100	No
SOx	0.007	100	No
PM 10	6.141	100	No
PM 2.5	0.074	100	No
Pb	0.000	25	No
NH3	0.024	100	No
CO2e	668.2		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.488	100	No
NOx	2.726	100	No
CO	23.482	100	No
SOx	0.048	100	No
PM 10	0.569	100	No
PM 2.5	0.283	100	No
Pb	0.000	25	No
NH3	0.269	100	No
CO2e	4720.8		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.624	100	No
NOx	12.382	100	No
CO	30.256	100	No
SOx	0.073	100	No
PM 10	53.764	100	No
PM 2.5	0.629	100	No
Pb	0.000	25	No
NH3	0.291	100	No
CO2e	7321.6		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.488	100	No
NOx	2.726	100	No
CO	23.482	100	No
SOx	0.048	100	No
PM 10	0.569	100	No

PM 2.5	0.283	100	No
Pb	0.000	25	No
NH3	0.269	100	No
CO2e	4720.8		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.531	100	No
NOx	2.898	100	No
CO	23.653	100	No
SOx	0.048	100	No
PM 10	0.579	100	No
PM 2.5	0.292	100	No
Pb	0.000	25	No
NH3	0.270	100	No
CO2e	4758.3		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.516	100	No
NOx	3.244	100	No
CO	23.917	100	No
SOx	0.051	100	No
PM 10	0.608	100	No
PM 2.5	0.322	100	No
Pb	0.000	25	No
NH3	0.269	100	No
CO2e	5344.9		

2025 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	3.548	100	No
NOx	3.818	100	No
CO	24.399	100	No
SOx	0.054	100	No
PM 10	0.652	100	No
PM 2.5	0.366	100	No
Pb	0.000	25	No
NH3	0.269	100	No
CO2e	6035.5		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Construction of Phase 1 Interim Facilities

3.	Personnel	Operations Personnel for Interim and Permament Facilities.
4.	Heating	Heating of Interim Facilities
5.	Emergency Generator	Emergancy Generator for Interim and Permanent Facilities
6.	Construction / Demolition	Construction of Permanent Facilities
7.	Heating	Heating of Permanent Facilities

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Santa Barbara
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construction of Phase 1 Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 10
Start Month: 2019

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2019

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.155987
SO_x	0.002745
NO_x	1.244345
CO	0.835587
PM 10	6.093857

Pollutant	Total Emissions (TONs)
PM 2.5	0.050107
Pb	0.000000
NH_3	0.001849
CO_2e	274.8

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft^2): 595000
Amount of Material to be Hauled On-Site (yd^3): 11167
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.124	000.003	000.093	001.081	000.047	000.020		000.024	00307.627
LDGT	000.313	000.004	000.201	002.090	000.048	000.021		000.025	00389.336
HDGV	000.652	000.012	001.435	009.670	000.183	000.078		000.045	01136.449
LDDV	000.028	000.003	000.147	000.293	000.062	000.034		000.008	00279.615
LDDT	000.099	000.004	000.568	000.620	000.116	000.086		000.008	00371.805
HDDV	000.227	000.014	005.388	001.218	000.227	000.133		000.029	01526.867
MC	004.492	000.002	001.255	024.283	000.019	000.009		000.054	00187.027

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.124	000.003	000.093	001.081	000.047	000.020		000.024	00307.627
LDGT	000.313	000.004	000.201	002.090	000.048	000.021		000.025	00389.336
HDGV	000.652	000.012	001.435	009.670	000.183	000.078		000.045	01136.449
LDDV	000.028	000.003	000.147	000.293	000.062	000.034		000.008	00279.615
LDDT	000.099	000.004	000.568	000.620	000.116	000.086		000.008	00371.805
HDDV	000.227	000.014	005.388	001.218	000.227	000.133		000.029	01526.867
MC	004.492	000.002	001.255	024.283	000.019	000.009		000.054	00187.027

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1

Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 193000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.124	000.003	000.093	001.081	000.047	000.020		000.024	00307.627
LDGT	000.313	000.004	000.201	002.090	000.048	000.021		000.025	00389.336
HDGV	000.652	000.012	001.435	009.670	000.183	000.078		000.045	01136.449
LDDV	000.028	000.003	000.147	000.293	000.062	000.034		000.008	00279.615
LDDT	000.099	000.004	000.568	000.620	000.116	000.086		000.008	00371.805
HDDV	000.227	000.014	005.388	001.218	000.227	000.133		000.029	01526.867
MC	004.492	000.002	001.255	024.283	000.019	000.009		000.054	00187.027

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)

1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Santa Barbara
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Operations Personnel for Interim and Permament Facilities.

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	3.440469
SO_x	0.038447
NO_x	1.942483
CO	22.827698
PM 10	0.506164

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.220100
Pb	0.000000
NH_3	0.269480
CO_2e	3803.1

3.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 748
Civilian Personnel: 1103
Support Contractor Personnel: 19
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule

Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.124	000.003	000.093	001.081	000.047	000.020		000.024	00307.627
LDGT	000.313	000.004	000.201	002.090	000.048	000.021		000.025	00389.336
HDGV	000.652	000.012	001.435	009.670	000.183	000.078		000.045	01136.449
LDDV	000.028	000.003	000.147	000.293	000.062	000.034		000.008	00279.615
LDDT	000.099	000.004	000.568	000.620	000.116	000.086		000.008	00371.805
HDDV	000.227	000.014	005.388	001.218	000.227	000.133		000.029	01526.867
MC	004.492	000.002	001.255	024.283	000.019	000.009		000.054	00187.027

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel

WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_{C}: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Heating

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Santa Barbara
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Heating of Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 8
End Year: 2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.198564
SO_x	0.021661
NO_x	3.610249
CO	3.032609

Pollutant	Total Emissions (TONs)
PM 2.5	0.274379
Pb	0.000000
NH_3	0.000000
CO_2e	4346.4

PM 10	0.274379			

4.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 193000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0827

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

4.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

4.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
$FC_{HER} = HA * EI / HV / 1000000$

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBTU/ft^3)
1000000: Conversion Factor

- Heating Emissions per Year
$HE_{POL} = FC * EF_{POL} / 2000$

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

5. Emergency Generator

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Santa Barbara
Regulatory Area(s): NOT IN A REGULATORY AREA

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Title: Emergancy Generator for Interim and Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.005650
SO_x	0.004759
NO_x	0.023288
CO	0.015552
PM 10	0.005083

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.005083
Pb	0.000000
NH_3	0.000000
CO_2e	2.7

5.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 1

- Default Settings Used: Yes

- Emergency Generators Consumption
Emergency Generator's Horsepower: 135 (default)
Average Operating Hours Per Year (hours): 30 (default)

5.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

5.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year

AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

6. Construction / Demolition

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

6.1 General Information & Timeline Assumptions

- Activity Location
County: Santa Barbara
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construction of Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 1
Start Month: 2021

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.179032
SO_x	0.026032
NO_x	9.827653
CO	6.945521
PM 10	53.204827

Pollutant	Total Emissions (TONs)
PM 2.5	0.354823
Pb	0.000000
NH_3	0.022191
CO_2e	2638.3

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 6
Number of Days: 12

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 826600
Amount of Material to be Hauled On-Site (yd^3): 18350
Amount of Material to be Hauled Off-Site (yd^3): 50000

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of	Hours Per Day

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

	Equipment	
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.114	000.003	000.084	000.992	000.047	000.020		000.023	00298.845
LDGT	000.288	000.004	000.178	001.871	000.048	000.021		000.024	00379.038
HDGV	000.600	000.011	001.339	008.875	000.183	000.078		000.045	01128.468
LDDV	000.026	000.003	000.125	000.281	000.060	000.032		000.008	00271.718
LDDT	000.094	000.003	000.533	000.594	000.112	000.082		000.008	00364.857
HDDV	000.194	000.014	004.796	001.133	000.211	000.117		000.028	01514.699
MC	004.452	000.002	001.252	023.791	000.019	000.009		000.054	00187.891

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Trenching/Excavating Phase

6.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 1
Number of Days: 18

6.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 2000
Amount of Material to be Hauled Off-Site (yd^3): 2000

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.114	000.003	000.084	000.992	000.047	000.020		000.023	00298.845
LDGT	000.288	000.004	000.178	001.871	000.048	000.021		000.024	00379.038
HDGV	000.600	000.011	001.339	008.875	000.183	000.078		000.045	01128.468
LDDV	000.026	000.003	000.125	000.281	000.060	000.032		000.008	00271.718
LDDT	000.094	000.003	000.533	000.594	000.112	000.082		000.008	00364.857
HDDV	000.194	000.014	004.796	001.133	000.211	000.117		000.028	01514.699
MC	004.452	000.002	001.252	023.791	000.019	000.009		000.054	00187.891

6.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)

$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.3 Building Construction Phase

6.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 12
Number of Days: 0

6.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 498000
Height of Building (ft): 70
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

6.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0845	0.0013	0.6033	0.3865	0.0228	0.0228	0.0076	128.82
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0293	0.0006	0.1458	0.2148	0.0056	0.0056	0.0026	54.462
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0362	0.0006	0.2977	0.2707	0.0130	0.0130	0.0032	61.074
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0280	0.0003	0.1634	0.1787	0.0088	0.0088	0.0025	25.665

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.114	000.003	000.084	000.992	000.047	000.020		000.023	00298.845

LDGT	000.288	000.004	000.178	001.871	000.048	000.021		000.024	00379.038
HDGV	000.600	000.011	001.339	008.875	000.183	000.078		000.045	01128.468
LDDV	000.026	000.003	000.125	000.281	000.060	000.032		000.008	00271.718
LDDT	000.094	000.003	000.533	000.594	000.112	000.082		000.008	00364.857
HDDV	000.194	000.014	004.796	001.133	000.211	000.117		000.028	01514.699
MC	004.452	000.002	001.252	023.791	000.019	000.009		000.054	00187.891

6.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.4 Paving Phase

6.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 1
Number of Days: 0

6.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 581400

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.114	000.003	000.084	000.992	000.047	000.020		000.023	00298.845
LDGT	000.288	000.004	000.178	001.871	000.048	000.021		000.024	00379.038
HDGV	000.600	000.011	001.339	008.875	000.183	000.078		000.045	01128.468
LDDV	000.026	000.003	000.125	000.281	000.060	000.032		000.008	00271.718
LDDT	000.094	000.003	000.533	000.594	000.112	000.082		000.008	00364.857
HDDV	000.194	000.014	004.796	001.133	000.211	000.117		000.028	01514.699
MC	004.452	000.002	001.252	023.791	000.019	000.009		000.054	00187.891

6.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

7. Heating

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Santa Barbara
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Heating of Permanent Facilities

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Description:

- Activity Start Date
Start Month: 8
Start Year: 2024

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)	Pollutant	Emissions Per Year (TONs)
VOC	0.101865	PM 2.5	0.140759
SO_x	0.011113	Pb	0.000000
NO_x	1.852086	NH_3	0.000000
CO	1.555752	CO_2e	2229.7
PM 10	0.140759		

7.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 498000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0781

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

7.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

7.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year

$FC_{HER} = HA * EI / HV / 1000000$

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBTU/ft^3)
1000000: Conversion Factor

- Heating Emissions per Year

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$HE_{POL} = FC * EF_{POL} / 2000$

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

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Redstone Arsenal Air Emissions Report

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DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: REDSTONE ARSENAL
State: Alabama
County(s): Madison
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: United States Space Command (USSPACECOM)

- Project Number/s (if applicable):

- Projected Action Start Date: 10 / 2019

- Action Purpose and Need:

The purpose of the Proposed Action is to further enact these recommendations by establishing a permanent operational USSPACECOM headquarters as a functional combatant command.

- Action Description:

A USSPACECOM headquarters would be established at one of five alternative locations, which include four AFBs and the Redstone Arsenal. Existing, vacant facilities and/or temporary/modular facilities would be used in the interim until the permanent headquarters facility is operational. USSPACECOM is expected to require permanent facility construction to accommodate approximately 1,870 personnel in a typical headquarters setting.

- Point of Contact

Name: Caitlin Shaw
Title: Contractor
Organization: AECOM
Email:
Phone Number:

2. Air Impact Analysis: Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

_____ applicable
__X__ not applicable

Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions.

"Air Quality Indicators" were used to provide an indication of the significance of potential impacts to air quality. These air quality indicators are EPA General Conformity Rule (GCR) thresholds (de minimis levels) that are applied out of context to their intended use. Therefore, these indicators do not trigger a regulatory requirement; however, they provide a warning that the action is potentially significant. It is important to note that these indicators only provide a clue to the potential impacts to air quality.

Given the GCR de minimis threshold values are the maximum net change an action can acceptably emit in non-attainment and maintenance areas, these threshold values would also conservatively indicate an actions emissions within an attainment would also be acceptable. An air quality indicator value of 100 tons/yr is used based on the GCR de minimis threshold for the least severe non-attainment classification for all criteria pollutants (see 40 CFR 93.153). Therefore, the worst-case year emissions were compared against the GCR Indicator and are summarized below.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Analysis Summary:

2019

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	0.559	100	No
NOx	1.654	100	No
CO	5.167	100	No
SOx	0.006	100	No
PM 10	6.106	100	No
PM 2.5	0.066	100	No
Pb	0.000	25	No
NH3	0.024	100	No
CO2e	726.3		

2020

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.636	100	No
NOx	5.100	100	No
CO	51.183	100	No
SOx	0.039	100	No
PM 10	0.172	100	No
PM 2.5	0.161	100	No
Pb	0.000	25	No
NH3	0.269	100	No
CO2e	5422.2		

2021

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	5.970	100	No
NOx	14.627	100	No
CO	58.616	100	No
SOx	0.064	100	No
PM 10	53.332	100	No
PM 2.5	0.531	100	No
Pb	0.000	25	No
NH3	0.291	100	No
CO2e	8015.6		

2022

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.636	100	No
NOx	5.100	100	No
CO	51.183	100	No
SOx	0.039	100	No
PM 10	0.172	100	No

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

PM 2.5	0.161	100	No
Pb	0.000	25	No
NH3	0.269	100	No
CO2e	5422.2		

2023

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.681	100	No
NOx	5.271	100	No
CO	51.365	100	No
SOx	0.039	100	No
PM 10	0.182	100	No
PM 2.5	0.171	100	No
Pb	0.000	25	No
NH3	0.270	100	No
CO2e	5459.7		

2024

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.672	100	No
NOx	5.757	100	No
CO	51.734	100	No
SOx	0.043	100	No
PM 10	0.222	100	No
PM 2.5	0.211	100	No
Pb	0.000	25	No
NH3	0.269	100	No
CO2e	6212.6		

2025 - (Steady State)

Pollutant	Action Emissions (ton/yr)	AIR QUALITY INDICATOR	
		Threshold (ton/yr)	Exceedance (Yes or No)
NOT IN A REGULATORY AREA			
VOC	4.712	100	No
NOx	6.477	100	No
CO	52.340	100	No
SOx	0.047	100	No
PM 10	0.277	100	No
PM 2.5	0.266	100	No
Pb	0.000	25	No
NH3	0.269	100	No
CO2e	7080.5		

None of estimated emissions associated with this action are above the GCR indicators, indicating no significant impact to air quality; therefore, no further air assessment is needed.

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Construction of Phase 1 Interim Facilities

3.	Personnel	Operations Personnel for Interim and Permament Facilities.
4.	Heating	Heating of Interim Facilities
5.	Emergency Generator	Emergancy Generator for Interim and Permanent Facilities
6.	Construction / Demolition	Construction of Permanent Facilities
7.	Heating	Heating of Permanent Facilities

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Montgomery
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construction of Phase 1 Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 10
Start Month: 2019

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2019

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.172426
SO_x	0.002679
NO_x	1.229112
CO	0.901655
PM 10	6.091501

Pollutant	Total Emissions (TONs)
PM 2.5	0.052277
Pb	0.000000
NH_3	0.001796
CO_2e	274.4

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft^2): 595000
Amount of Material to be Hauled On-Site (yd^3): 11167
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.325	000.002	000.257	003.550	000.007	000.006		000.024	00334.919
LDGT	000.419	000.003	000.448	005.138	000.009	000.008		000.025	00430.827
HDGV	000.812	000.005	001.115	016.079	000.019	000.017		000.045	00772.599
LDDV	000.106	000.003	000.138	002.565	000.004	000.004		000.008	00326.960
LDDT	000.268	000.004	000.420	004.693	000.007	000.006		000.008	00468.644
HDDV	000.500	000.013	005.053	001.810	000.192	000.177		000.028	01511.472
MC	002.711	000.003	000.707	013.296	000.026	000.023		000.053	00394.070

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0786	0.0013	0.4574	0.5139	0.0214	0.0214	0.0070	119.75
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0982	0.0014	0.6490	0.5786	0.0316	0.0316	0.0088	132.96
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0595	0.0012	0.3971	0.3522	0.0158	0.0158	0.0053	122.63
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2226	0.0024	1.6948	0.8387	0.0682	0.0682	0.0200	239.58
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2020	0.0026	1.4692	0.8161	0.0594	0.0594	0.0182	262.94
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.325	000.002	000.257	003.550	000.007	000.006		000.024	00334.919
LDGT	000.419	000.003	000.448	005.138	000.009	000.008		000.025	00430.827
HDGV	000.812	000.005	001.115	016.079	000.019	000.017		000.045	00772.599
LDDV	000.106	000.003	000.138	002.565	000.004	000.004		000.008	00326.960
LDDT	000.268	000.004	000.420	004.693	000.007	000.006		000.008	00468.644
HDDV	000.500	000.013	005.053	001.810	000.192	000.177		000.028	01511.472
MC	002.711	000.003	000.707	013.296	000.026	000.023		000.053	00394.070

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2019

- Phase Duration
Number of Month: 1

Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 193000
Height of Building (ft): 12
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0953	0.0013	0.7235	0.3981	0.0286	0.0286	0.0086	128.84
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0344	0.0006	0.1923	0.2166	0.0085	0.0085	0.0031	54.473
Generator Sets Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0430	0.0006	0.3483	0.2755	0.0168	0.0168	0.0038	61.089
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0471	0.0007	0.3018	0.3630	0.0159	0.0159	0.0042	66.904
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0343	0.0003	0.1832	0.1842	0.0116	0.0116	0.0031	25.680

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.325	000.002	000.257	003.550	000.007	000.006		000.024	00334.919
LDGT	000.419	000.003	000.448	005.138	000.009	000.008		000.025	00430.827
HDGV	000.812	000.005	001.115	016.079	000.019	000.017		000.045	00772.599
LDDV	000.106	000.003	000.138	002.565	000.004	000.004		000.008	00326.960
LDDT	000.268	000.004	000.420	004.693	000.007	000.006		000.008	00468.644
HDDV	000.500	000.013	005.053	001.810	000.192	000.177		000.028	01511.472
MC	002.711	000.003	000.707	013.296	000.026	000.023		000.053	00394.070

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = BA * BH * (0.42 / 1000) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)

1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Montgomery
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Operations Personnel for Interim and Permament Facilities.

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	4.576190
SO_x	0.028158
NO_x	4.085143
CO	50.334228
PM 10	0.091839

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.080714
Pb	0.000000
NH_3	0.269276
CO_2e	4225.7

3.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 748
Civilian Personnel: 1103
Support Contractor Personnel: 19
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule

Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.325	000.002	000.257	003.550	000.007	000.006		000.024	00334.919
LDGT	000.419	000.003	000.448	005.138	000.009	000.008		000.025	00430.827
HDGV	000.812	000.005	001.115	016.079	000.019	000.017		000.045	00772.599
LDDV	000.106	000.003	000.138	002.565	000.004	000.004		000.008	00326.960
LDDT	000.268	000.004	000.420	004.693	000.007	000.006		000.008	00468.644
HDDV	000.500	000.013	005.053	001.810	000.192	000.177		000.028	01511.472
MC	002.711	000.003	000.707	013.296	000.026	000.023		000.053	00394.070

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel

WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year
$VMT_{Total} = VMT_{AD} + VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_{C}: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Heating

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Montgomery
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Heating of Interim Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: No
End Month: 8
End Year: 2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.259069
SO_x	0.028262
NO_x	4.710349
CO	3.956693

Pollutant	Total Emissions (TONs)
PM 2.5	0.357987
Pb	0.000000
NH_3	0.000000
CO_2e	5670.8

PM 10	0.357987		

4.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 193000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.1079

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

4.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

4.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBTU/ft^3)
1000000: Conversion Factor

- Heating Emissions per Year
HE_{POL}= FC * EF_{POL} / 2000

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

5. Emergency Generator

5.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Montgomery
Regulatory Area(s): NOT IN A REGULATORY AREA

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Title: Emergancy Generator for Interim and Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 12
Start Year: 2019

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.005650
SO_x	0.004759
NO_x	0.023288
CO	0.015552
PM 10	0.005083

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.005083
Pb	0.000000
NH_3	0.000000
CO_2e	2.7

5.2 Emergency Generator Assumptions

- Emergency Generator
Type of Fuel used in Emergency Generator: Diesel
Number of Emergency Generators: 1

- Default Settings Used: Yes

- Emergency Generators Consumption
Emergency Generator's Horsepower: 135 (default)
Average Operating Hours Per Year (hours): 30 (default)

5.3 Emergency Generator Emission Factor(s)

- Emergency Generators Emission Factor (lb/hp-hr)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
0.00279	0.00235	0.0115	0.00768	0.00251	0.00251			1.33

5.4 Emergency Generator Formula(s)

- Emergency Generator Emissions per Year
AE_{POL}= (NGEN * HP * OT * EF_{POL}) / 2000

AE_{POL}: Activity Emissions (TONs per Year)
NGEN: Number of Emergency Generators
HP: Emergency Generator's Horsepower (hp)
OT: Average Operating Hours Per Year (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hp-hr)

6. Construction / Demolition

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

6.1 General Information & Timeline Assumptions

- Activity Location
County: Montgomery
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Construction of Permanent Facilities

- Activity Description:

- Activity Start Date
Start Month: 1
Start Month: 2021

- Activity End Date
Indefinite: False
End Month: 7
End Month: 2023

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	1.378669
SO_x	0.025222
NO_x	9.698170
CO	7.616344
PM 10	53.169565

Pollutant	Total Emissions (TONs)
PM 2.5	0.379214
Pb	0.000000
NH_3	0.022191
CO_2e	2630.9

6.1 Site Grading Phase

6.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 6
Number of Days: 12

6.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 826600
Amount of Material to be Hauled On-Site (yd^3): 18350
Amount of Material to be Hauled Off-Site (yd^3): 50000

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of	Hours Per Day

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

	Equipment	
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	3	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.294	000.002	000.221	003.370	000.006	000.006		000.023	00325.374
LDGT	000.376	000.003	000.389	004.772	000.008	000.007		000.024	00418.504
HDGV	000.739	000.005	000.983	014.997	000.018	000.016		000.045	00770.173
LDDV	000.101	000.003	000.131	002.585	000.004	000.004		000.008	00316.802
LDDT	000.237	000.004	000.371	004.398	000.007	000.006		000.008	00448.891
HDDV	000.458	000.013	004.584	001.678	000.167	000.154		000.028	01498.941
MC	002.697	000.003	000.706	013.124	000.026	000.023		000.054	00394.164

6.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Trenching/Excavating Phase

6.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 10
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 1
Number of Days: 18

6.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 12000
Amount of Material to be Hauled On-Site (yd^3): 2000
Amount of Material to be Hauled Off-Site (yd^3): 2000

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite

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	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.294	000.002	000.221	003.370	000.006	000.006		000.023	00325.374
LDGT	000.376	000.003	000.389	004.772	000.008	000.007		000.024	00418.504
HDGV	000.739	000.005	000.983	014.997	000.018	000.016		000.045	00770.173
LDDV	000.101	000.003	000.131	002.585	000.004	000.004		000.008	00316.802
LDDT	000.237	000.004	000.371	004.398	000.007	000.006		000.008	00448.891
HDDV	000.458	000.013	004.584	001.678	000.167	000.154		000.028	01498.941
MC	002.697	000.003	000.706	013.124	000.026	000.023		000.054	00394.164

6.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD}$ = (20 * ACRE * WD) / 2000

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

VMT_{VE} = (HA_{OnSite} + $HA_{OffSite}$) * (1 / HC) * HT

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)

$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.3 Building Construction Phase

6.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 12
Number of Days: 0

6.3.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 498000
Height of Building (ft): 70
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes

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Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	7
Forklifts Composite	3	8
Generator Sets Composite	1	8
Tractors/Loaders/Backhoes Composite	3	7
Welders Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

6.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0845	0.0013	0.6033	0.3865	0.0228	0.0228	0.0076	128.82
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0293	0.0006	0.1458	0.2148	0.0056	0.0056	0.0026	54.462
Generator Sets Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0362	0.0006	0.2977	0.2707	0.0130	0.0130	0.0032	61.074
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890
Welders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0280	0.0003	0.1634	0.1787	0.0088	0.0088	0.0025	25.665

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.294	000.002	000.221	003.370	000.006	000.006		000.023	00325.374

LDGT	000.376	000.003	000.389	004.772	000.008	000.007		000.024	00418.504
HDGV	000.739	000.005	000.983	014.997	000.018	000.016		000.045	00770.173
LDDV	000.101	000.003	000.131	002.585	000.004	000.004		000.008	00316.802
LDDT	000.237	000.004	000.371	004.398	000.007	000.006		000.008	00448.891
HDDV	000.458	000.013	004.584	001.678	000.167	000.154		000.028	01498.941
MC	002.697	000.003	000.706	013.124	000.026	000.023		000.054	00394.164

6.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.4 Paving Phase

6.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2023

- Phase Duration
Number of Month: 1
Number of Days: 0

6.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 581400

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0687	0.0013	0.3576	0.5112	0.0158	0.0158	0.0062	119.73
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Scrapers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1814	0.0026	1.2262	0.7745	0.0491	0.0491	0.0163	262.89
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.294	000.002	000.221	003.370	000.006	000.006		000.023	00325.374
LDGT	000.376	000.003	000.389	004.772	000.008	000.007		000.024	00418.504
HDGV	000.739	000.005	000.983	014.997	000.018	000.016		000.045	00770.173
LDDV	000.101	000.003	000.131	002.585	000.004	000.004		000.008	00316.802
LDDT	000.237	000.004	000.371	004.398	000.007	000.006		000.008	00448.891
HDDV	000.458	000.013	004.584	001.678	000.167	000.154		000.028	01498.941
MC	002.697	000.003	000.706	013.124	000.026	000.023		000.054	00394.164

6.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
VMT_{WT} = WD * WT * 1.25 * NE

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
VOC_P = (2.62 * PA) / 43560

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

7. Heating

7.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Montgomery
Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Heating of Permanent Facilities

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity Description:

- Activity Start Date
Start Month: 8
Start Year: 2024

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.130298
SO_x	0.014214
NO_x	2.369057
CO	1.990008
PM 10	0.180048

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.180048
Pb	0.000000
NH_3	0.000000
CO_2e	2852.1

7.2 Heating Assumptions

- Heating
Heating Calculation Type: Heat Energy Requirement Method

- Heat Energy Requirement Method
Area of floorspace to be heated (ft^2): 498000
Type of fuel: Natural Gas
Type of boiler/furnace: Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
Heat Value (MMBtu/ft^3): 0.00105
Energy Intensity (MMBtu/ft^2): 0.0999

- Default Settings Used: Yes

- Boiler/Furnace Usage
Operating Time Per Year (hours): 900 (default)

7.3 Heating Emission Factor(s)

- Heating Emission Factors (lb/1000000 scf)

VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
5.5	0.6	100	84	7.6	7.6			120390

7.4 Heating Formula(s)

- Heating Fuel Consumption ft^3 per Year
FC_{HER}= HA * EI / HV / 1000000

FC_{HER}: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated (ft^2)
EI: Energy Intensity Requirement (MMBtu/ft^2)
HV: Heat Value (MMBTU/ft^3)
1000000: Conversion Factor

- Heating Emissions per Year

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

$HE_{POL} = FC * EF_{POL} / 2000$

HE_{POL}: Heating Emission Emissions (TONs)
FC: Fuel Consumption
EF_{POL}: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

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Appendix F

Site Alternative Selection Process

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Buckley AFB

Four interim and two permanent site alternatives were evaluated at Buckley AFB (**Table F-1**). Three interim and permanent site alternatives were eliminated from further analysis. One interim and two permanent site alternatives for the Proposed Action met all established selection standards for the Proposed Action and are retained for further evaluation in the EA.

Table F-1 Alternatives Evaluation Buckley AFB

Category/ Selection Standard	Interim				Permanent		
	North of Gym/ Shopette	Building 1005	North Corner District	West End District (Interim Site Alternative 1)	Building 1005	North Corner Site 1 (Permanent Site Alternative 1)	North Corner Site 2 (Permanent Site Alternative 2)
Cost and Timing	✓	✓	✓	✓	✓	✓	✓
Interim/Permanent Capacity and Support	✓	✗	✗	✓	✗	✓	✓
Environmental	✗	✓	✓	✓	✓	✓	✓

Note:

✓ = meets or partially meets criterion

✗ = fails to meet criterion

Peterson AFB

One interim and one permanent site alternatives were evaluated at Peterson AFB (**Table F-2**). These interim and permanent site alternatives meet all established selection standards for the Proposed Action, and are retained for further evaluation in the EA.

Table F-2 Alternatives Evaluation Peterson AFB

Selection Standard	Interim	Permanent
	Command Complex and Leased Off-base Office Space (Interim Site Alternative 1)	Command Complex (Permanent Site Alternative 1)
Cost and Timing	✓	✓
Interim/Permanent Capacity and Support	✓	✓
Environmental	✓	✓

Note:

✓ = meets or partially meets criterion

✗ = fails to meet criterion

Schriever AFB

Three interim and four permanent site alternatives were evaluated at Schriever AFB (**Table F-3**). One interim and two permanent site alternatives were eliminated from further analysis. Two interim and two permanent site alternatives at Schriever AFB meet all established selection standards for the Proposed Action, and are retained for further evaluation in the EA.

Table F-3 Alternatives Evaluation Schriever AFB

Selection Standard	Interim			Permanent			
	South of Building 24	West Side of RA (Interim Site Alternative 1 [Inside RA / Leased Off-base Office Space])	North of Building 24 (Interim Site Alternative 2 [Outside RA / Leased Off-base Office Space])	East of CSOF (Inside RA)	East Side of RA (Inside RA)	West Side of RA (Inside RA) (Permanent Site Alternative 1 [Inside RA])	Northwest of Building 24 (Outside RA) (Permanent Site Alternative 2 [Outside RA])
Cost and Timing	✓	✓	✓	✓	✗	✓	✓
Interim/Permanent Capacity and Support	✗	✓	✓	✗	✗	✓	✓
Environmental	✓	✓	✓	✓	✓	✓	✓

Notes:

✓ = meets or partially meets criterion

✗ = fails to meet criterion

CSOF = Consolidated Space Operations Facility

RA = Restricted Area

Vandenberg AFB

Three interim and seven permanent site alternatives were evaluated at Vandenberg AFB (**Table F-4**). Two interim and six permanent site alternatives were eliminated from further analysis. One interim and one permanent site alternative at Vandenberg AFB met all established selection standards for the Proposed Action, and are retained for further evaluation in the EA.

Table F-4 Alternatives Evaluation Vandenberg AFB

Selection Standard	Interim			Permanent						
	Building 11777	Building 8401	Buildings 6523, 7525, and 10577 (Interim Site Alternative 1)	11777	Airfield	California North	California South (Permanent Site Alternative 1)	California Southwest	Nebraska	Washington
Cost and Timing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Interim/Permanent Capacity and Support	✗	✗	✓	✗	✗	✓	✓	✗	✗	✗
Environmental	✓	✓	✓	✗	✗	✗	✓	✓	✗	✗

Notes:

✓ = meets or partially meets criterion

✗ = fails to meet criterion

Redstone Arsenal

Three interim and four permanent site alternatives were evaluated at Redstone Arsenal (**Table F-5**). One interim and three permanent site alternatives were dismissed from analysis. Two interim and one permanent site alternatives at Redstone Arsenal meet all established selection standards for the Proposed Action, and are retained for further evaluation in the EA.

Table F-5 Alternatives Evaluation Redstone Arsenal

Category/ Selection Standard	Interim			Permanent			
	Redstone Gateway, and Buildings 5201 and 5220(Interim Site Alternative 1)	Area 2, and Buildings 5201 and 5220 (Interim Site Alternative 2)	Buildings 5303 and 5304	Area 1	Area 3	Area 4	Area 5 and Building 5201 (Permanent Site Alternative 1)
Cost and Timing	✓	✓	✗	✗	✗	✗	✓
Interim/Permanent Capacity and Support	✓	✓	✗	✓	✗	✓	✓
Environmental	✓	✓	✓	✗	✓	✓	✓

Note:

✓ = meets or partially meets criterion

✗ = fails to meet criterion

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