APPENDIX A. INTERGOVERNMENTAL COORDINATION, PUBLIC AND AGENCY PARTICIPATION

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Mailing List

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Benton, CA 93512

L'eaux Stewart, Chairperson
Big Pine Paiute Tribe
P.O. Box 700
Big Pine, CA 93513

Maryl Picard, Chairperson
Bishop Paiute Tribe
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Bishop, CA 93514

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Colorado River Indian Tribes
26600 Mohave Road
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P.O. Box 140068
Duckwater, NV 89314

Carl Dahlberg, Chairperson
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Kaibab Band of Southern Paiutes
HC 65 Box 2
Fredonia, AZ 86022

Richard Button, Chairperson
Lone Pine Paiute-Shoshone Tribe
P.O. Box 747
Lone Pine, CA 93545

Diana Buckner, Chairwoman
Ely Shoshone Tribe
250 Heritage Drive #B
Ely, NV 89301

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#1 Paiute Drive
Las Vegas, NV 89106

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Moapa Band of Paiutes
P.O. Box 340
Moapa, NV 89025

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Native American Coordinator
Pahrump Paiute Tribe
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Vice-Chairperson
Yomba Shoshone Tribe
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Austin, NV 89310

Ronnie Snooks, Chairperson
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USDA Natural Resource Conservation Service
Las Vegas Service Center
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Commission of Southern Nevada
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Community Development
Planning & Zoning Division
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Ryann Juden, City Manager
City of North Las Vegas
Economic Development Division
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Steve Kirk, Commissioner
Clark County Dept of Comprehensive Planning
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Las Vegas, NV 89155

Jodi Bechtel, Acting Planning Manager
Clark County Air Quality Planning Division
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Las Vegas, NV 89110

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Nevada Division of State Lands
State Clearinghouse
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Carson City, NV 89701-5246

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Washington, DC 20510

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US Senator
United States Senate
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United States Congress
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ACC CG
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Las Vegas, NV 89183

Edgar Patino
ACC CG
12245 Nasino Ave
Las Vegas, NV 89138

Nellis AFB Library
5941 Fitzgerald Boulevard
Nellis Air Force Base, NV 89191-7078

North Las Vegas Library
2250 Las Vegas Blvd N
North Las Vegas, NV 89030

Alexander Library
1755 W Alexander Rd
North Las Vegas, NV 89032

West Las Vegas Library
951 W Lake Mead Blvd
Las Vegas, NV 89106

East Las Vegas Library
2851 E Bonanza Rd
Las Vegas, NV 89101

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DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

27 October 2023

99 CES/CENP
6020 Beale Avenue
Nellis AFB NV 89191-6520

Catrina Williams
Field Manager
BLM – Las Vegas Field Office
Las Vegas Field Office
4701 North Torrey Pines Drive
Las Vegas NV 89130

Dear Ms. Williams

The United States Air Force (Air Force) is preparing an Environmental Impact Statement (EIS) in accordance with the *National Environmental Policy Act* to assess the potential environmental impacts associated with Master Plan and Installation Development activities at Nellis Air Force Base (AFB), Nevada. To consider possible environmental concerns, the Air Force is conducting public scoping and engaging early with all potentially affected resource agencies as it formulates the undertaking. Accordingly, the Air Force seeks consultation with your office.

Proposed Action

The Proposed Action includes development of the east side of Nellis AFB to address current mission constraints and future mission growth, as the majority of the land available to construct facilities and infrastructure is located in the undeveloped area on the east side of the Installation. Facilities with similar uses and mission functions would be located in the same general area.

Purpose and Need

The purpose of the Proposed Action is to optimize Nellis AFB's current operational capabilities and capacity for future warfighting training and testing. The Proposed Action is needed because the current Nellis AFB and United States Air Force Warfare Center mission sets are outpacing the ability to expand resources and capacity. In addition, the Air Force anticipates that facility requirements are likely to increase over time through normal attrition and the arrival of new missions and that the number of active duty and civilian personnel would also increase. The existing infrastructure does not meet current and future mission needs; mission capability at Nellis AFB is nearing physical capacity, and additional flightline support facilities and infrastructure are needed to meet anticipated future growth. The Proposed Action is also needed to relieve stress on facility and infrastructure constraints on the west side of the Installation. Flying units are currently sharing hangar space, which is not conducive to future mission growth.

Presently, Installation infrastructure and utilities are a limitation to operational expansion and growth; utilities and the west-side ramp are reaching full operational capacity and must be expanded to accommodate future operations. Without development of the east side of Nellis AFB, the existing facilities and infrastructure at Nellis AFB could be insufficient to meet Air Force and Department of Defense future mission requirements and would require current missions to continue to operate in deficient facilities.

Environmental Impact Statement

In order to address facility requirements needed to support current and future mission structure changes and the associated increase in mission personnel, the Air Force is proposing two alternatives to gain functional capacity and support future mission growth at Nellis AFB: Alternative 1, complete build-out, and Alternative 2, partial build-out. The Air Force will also evaluate a No Action Alternative in the EIS. The Air Force is early in the planning process and has not yet identified a Preferred Alternative. **Attachment 1** shows the location of the Proposed Action and a comparison of each alternative.

Alternative 1 would involve the complete build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide the Installation with the facilities and space required to accomplish its current and long-term mission goals. Alternative 1 would fully utilize this undeveloped area to construct the facilities and infrastructure needed to meet current and future mission needs over the next decade. Development of the east side would include airfield, industrial, and administrative facilities; lodging/residential quarters; and community morale and welfare facilities to improve mission readiness. Additional utilities and infrastructure also would be installed to meet mission requirements. Alternative 1 would also include dedicated open space to be used for morale, welfare, recreation, and training.

Alternative 2 would involve a partial build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide Nellis AFB with the facilities and space required to accomplish its current and mid-term mission goals. Alternative 2 would include a reduced development footprint compared to Alternative 1 but would still address current mission constraints. Alternative 2 would allow the Installation to meet mid-term requirements for future growth and would provide access to airfield, industrial, and administrative facilities for personnel working on the east side of the Installation.

The EIS will assess the potential environmental consequences associated with the Proposed Action and Alternatives, including the No Action Alternative. Potential impacts identified during the initial planning stages include effects on land use; air quality and climate change; earth, water, biological, and cultural resources; noise; hazardous materials and waste, toxic substances, and contaminated sites; infrastructure, including transportation and utilities; safety and occupational health; socioeconomics; and environmental justice and protection of children. The EIS will also examine the cumulative effects when combined with past, present, and reasonably foreseeable environmental trends and future actions within the project area. In support of this process, we request your input in identifying general or specific issues or areas of concern you believe should be addressed in the EIS.

The Air Force invites you to attend the public scoping meeting listed below. The public scoping meeting will be held in an open house format, providing additional information about the Proposed Action and inviting comments on the Air Force's proposal.

Cora Coleman Senior Center
2100 Bonnie Lane
Las Vegas, Nevada 89156

November 14 and 15, 2023
5:00 p.m. to 7:00 p.m. (local time)

Additional notification will be sent when the Draft EIS is completed and we will provide information about the public comment period, during which you may make comments on the Draft EIS.

So that we remain on schedule to complete the environmental impact analysis process in a timely manner, we are requesting your response to this notice no later than 30 days from receipt of this correspondence. Please submit your written comments through the project website at www.nellisafbeis.com or mail comments to:

ATTN: Master Plan and Installation Development at Nellis AFB
2222 S. 4th Avenue
P.O. Box 6257
Yuma, AZ 85366

Should you or your staff have any questions about this project, please contact the Air Force Project Manager, Daniel Fisher at daniel.fisher.26@us.af.mil.

The Air Force appreciates your interest in and support of its military mission. We thank you in advance for your assistance and look forward to your response.

Sincerely,

CHARLES W. ROWLAND JR.
Chief, Portfolio Optimization

Attachment:
1. Project Location Map – Comparison of Alternatives 1 and 2

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

27 October 2023

Jenny L. Gibson, Lt Col, USAF
Commander, 99th Civil Engineer Squadron
6020 Beale Avenue
Nellis AFB NV 89191-6520

Shane Saulque, Chairperson
Benton Paiute Indian Tribe
25669 Highway 6
PMB I
Benton CA 93512

Dear Chairperson Saulque

The United States Air Force (Air Force) is preparing an Environmental Impact Statement (EIS) in accordance with the *National Environmental Policy Act* (NEPA) to assess the potential environmental impacts associated with Master Plan and Installation Development activities at Nellis Air Force Base (AFB), Nevada. To consider possible environmental concerns, the Air Force is conducting public scoping and engaging early with resource agencies, local governments, tribal governments, and other interested parties. Accordingly, the Air Force is notifying your government regarding the Proposed Action. This letter is a follow-up to the letter mailed to the Benton Paiute Indian Tribe regarding this action on March 29, 2023. This letter includes additional information regarding the federal undertaking as described below.

Proposed Action

The Proposed Action includes development of the east side of the flightline at Nellis AFB to address current mission constraints and future mission growth, as the majority of the land available to construct facilities and infrastructure is located in the undeveloped area on the east side of the Installation. Facilities with similar uses and mission functions would be located in the same general area. **Attachment 1** shows the location of the Proposed Action and a comparison of the two proposed alternatives.

Purpose and Need

The purpose of the Proposed Action (undertaking) is to optimize Nellis AFB's current operational capabilities and capacity for future warfighting training and testing. The Proposed Action is needed because the current Nellis AFB and United States Air Force Warfare Center mission sets are outpacing the ability to expand resources and capacity. In addition, the Air Force anticipates that facility requirements are likely to increase over time due to the arrival of new missions and associated increases in active duty and civilian personnel. The existing infrastructure does not meet current and future mission needs; mission capability at Nellis AFB is nearing physical capacity, and additional flightline support facilities and infrastructure are needed to meet anticipated future growth. The Proposed Action is also needed to relieve stress on facility and infrastructure constraints on the west side of the Installation. Flying units are currently sharing hangar space, which is not conducive to future mission growth. Presently, Installation infrastructure and utilities are a limitation to operational expansion and growth;

utilities and the west-side ramp are reaching full operational capacity and must be expanded to accommodate future operations. Without development of the east side of Nellis AFB, the existing facilities and infrastructure at Nellis AFB could be insufficient to meet Air Force and Department of Defense future mission requirements and would require current missions to continue to operate in deficient facilities.

Environmental Impact Statement

In order to address facility requirements needed to support current and future mission structure changes and the associated increase in mission personnel, the Air Force is proposing two alternatives to gain functional capacity and support future mission growth at Nellis AFB: Alternative 1, complete build-out, and Alternative 2, partial build-out. The Air Force will also evaluate a No Action Alternative in the EIS. The Air Force is early in the planning process and has not yet identified a preferred alternative.

Alternative 1 would involve the complete build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide the Installation with the facilities and space required to accomplish its current and long-term mission goals. Alternative 1 would fully utilize this undeveloped area to construct the facilities and infrastructure needed to meet current and future mission needs over the next decade. Development of the east side would include airfield, industrial, and administrative facilities; lodging/residential quarters; and community morale and welfare facilities to improve mission readiness. Additional utilities and infrastructure also would be installed to meet mission requirements. Alternative 1 would also include dedicated open space to be used for morale, welfare, recreation, and training.

Alternative 2 would involve a partial build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide Nellis AFB with the facilities and space required to accomplish its current and mid-term mission goals. Alternative 2 would include a reduced development footprint compared to Alternative 1 but would still address current mission constraints. Alternative 2 would allow the Installation to meet mid-term requirements for future growth and would provide access to airfield, industrial, and administrative facilities for personnel working on the east side of the Installation.

The EIS will assess the potential environmental consequences associated with the Proposed Action and Alternatives, including the No Action Alternative. Potential impacts identified during the initial planning stages include effects on land use; air quality and climate change; earth, water, biological, and cultural resources; noise; hazardous materials and waste, toxic substances, and contaminated sites; infrastructure, including transportation and utilities; safety and occupational health; socioeconomics; and environmental justice and protection of children. The EIS will also examine the cumulative effects when combined with past, present, and reasonably foreseeable environmental trends and future actions within the project area. In support of this process, we request your input in identifying general or specific issues or areas of concern you believe should be addressed in the EIS.

Area of Potential Effect (APE)

As currently defined, the APE is on the east side of the Nellis AFB flightline. The proposed development would occur within Sections 35 and 36, Township 62 East, Range 35

South; Sections 1, 2, 3, 10, 11, and 12, Township 20 South, Range 65 East; Section 6, Township 20 South, Range 63 East; Mount Diablo Meridian on the Las Vegas Northeast (1985) 7.5-minute USGS quadrangle map. Given the long-term time scale of the project, it has been proposed that the EIS will take a land use approach, analyzing broad categories of functional uses. This approach would break the land up into zones that would then be labeled accordingly (e.g., residential, mission support). Future individual projects may then be subject to further consultation depending on the results of the analysis and tribal input.

Nellis AFB is continuing to coordinate with the Nevada State Historic Preservation Office (SHPO) and tribes to determine potential impacts to historic properties and properties of religious or cultural significance in the APE. Most (98 percent) of the east-side development area has been surveyed previously for cultural resources. A cultural resources survey was conducted for an unsurveyed portion of the APE to provide additional information for the analysis of the potential impacts in this EIS. This included surveying 15 acres of Nellis AFB property in response to the planned east-side development activities and reviewing the Nevada Cultural Resources Information System database, Nellis AFB records, the *National Register of Historic Places* (National Register), and General Land Office records. There are approximately 45 acres within the project area that still need to be surveyed. The Air Force is planning to survey the remaining 45 acres and Nellis AFB will provide the findings of this survey to the Nevada SHPO and your government to solicit your feedback. Surveys and literature reviews conducted in the past determined that there are no historic properties or archaeological materials in the APE, and no materials or properties had been determined eligible for listing on the National Register. Once all pertinent information regarding the project area is known, Nellis AFB will initiate consultation with the Nevada SHPO and your government.

In accordance with 36 CFR Part 800, Department of Defense Instruction 4710.02, and Executive Order 13175, Nellis AFB is inviting your government to comment on the Proposed Action and provide potential information or concerns about the undertaking. Nellis AFB recognizes, respects, and would like to take into consideration the significance the tribes ascribe to the land and cultural resources when considering this undertaking; therefore, pursuant to 36 CFR § 800.4(a)(4), Nellis AFB invites the tribes to provide information on properties of religious or cultural significance that may be affected by the proposed undertaking. If possible, Nellis AFB would like to use any information provided by the tribes to develop appropriate alternatives for the EIS in a way that helps to sustain the Air Force mission while minimizing effects to tribal resources. In addition, we would appreciate any input you have to identify properties of cultural or religious significance that may be located within the proposed APE for the Proposed Action and Alternatives and regarding concerns for potential effects of the Proposed Action on significant cultural resources.

Nellis AFB seeks to integrate fully the principles of meaningful consultation and consider the unique perspectives of your government when applying these principles. Should you have any questions about the project or want to arrange a meeting to discuss the Proposed Action, please contact the Nellis AFB Interim Cultural Resources Program Manager, Mike Atkin, via email at michael.atkin@us.af.mil or by phone at 702-652-7639. So that we remain on schedule to complete the environmental impact analysis process in a timely manner, please provide your response no later than 30 days from receipt of this correspondence.

The Air Force invites you to attend the public scoping meeting listed below. The public scoping meeting will be held in an open house format providing additional information about the Proposed Action and inviting comments on the Air Force's proposal.

Cora Coleman Senior Center
2100 Bonnie Lane
Las Vegas, Nevada 89156

November 14 and 15, 2023
5:00 p.m. to 7:00 p.m. (local time)

Additional notification will be sent when the Draft EIS is completed and we will provide information about the public comment period, during which you may make comments on the Draft EIS.

The Air Force appreciates your interest in and support of its military mission. We thank you in advance for your assistance and look forward to your response.

Sincerely,

Jenny L. Gibson

JENNY L. GIBSON, Lt Col, USAF
Commander

Attachment:
1. Project Location Map – Comparison of Alternatives 1 and 2

DEPARTMENT OF THE AIR FORCE
99TH CIVIL ENGINEER SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

27 October 2023

Jenny L. Gibson, Lt Col, USAF
Commander, 99th Civil Engineer Squadron
6020 Beale Avenue
Nellis AFB NV 89191-6520

Rebecca Palmer
State Historic Preservation Officer
Nevada State Historic Preservation Office
901 S. Stewart St., Suite 5004
Carson City NV 89701

Dear Ms. Palmer

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accommodate future operations. Without development of the east side of Nellis AFB, the existing facilities and infrastructure at Nellis AFB could be insufficient to meet Air Force and Department of Defense future mission requirements and would require current missions to continue to operate in deficient facilities.

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Alternative 1 would involve the complete build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide the Installation with the facilities and space required to accomplish its current and long-term mission goals. Alternative 1 would fully utilize this undeveloped area to construct the facilities and infrastructure needed to meet current and future mission needs over the next decade. Development of the east side would include airfield, industrial, and administrative facilities; lodging/residential quarters; and community morale and welfare facilities to improve mission readiness. Additional utilities and infrastructure also would be installed to meet mission requirements. Alternative 1 would also include dedicated open space to be used for morale, welfare, recreation, and training.

Alternative 2 would involve a partial build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide Nellis AFB with the facilities and space required to accomplish its current and mid-term mission goals. Alternative 2 would include a reduced development footprint compared to Alternative 1 but would still address current mission constraints. Alternative 2 would allow the Installation to meet mid-term requirements for future growth and would provide access to airfield, industrial, and administrative facilities for personnel working on the east side of the Installation.

The EIS will assess the potential environmental consequences associated with the Proposed Action and Alternatives, including the No Action Alternative. Potential impacts identified during the initial planning stages include effects on land use; air quality and climate change; earth, water, biological, and cultural resources; noise; hazardous materials and waste, toxic substances, and contaminated sites; infrastructure, including transportation and utilities; safety and occupational health; socioeconomics; and environmental justice and protection of children. The EIS will also examine the cumulative effects when combined with past, present, and reasonably foreseeable environmental trends and future actions within the project area. In support of this process, we request your input in identifying general or specific issues or areas of concern you believe should be addressed in the EIS.

Area of Potential Effect (APE)

As currently defined, the direct APE is on the east side of the Nellis AFB flightline. The proposed development would occur within Sections 35 and 36, Township 62 East, Range 35 South; Sections 1, 2, 3, 10, 11, and 12, Township 20 South, Range 65 East; Section 6, Township

20 South, Range 63 East; Mount Diablo Meridian on the Las Vegas Northeast (1985) 7.5-minute United States Geological Survey quadrangle map. Given the long-term time scale of the project, it has been proposed that the EIS will take a land use approach, analyzing broad categories of functional uses. This approach would group the land into zones that would then be labeled accordingly (e.g., residential, mission support).

The Proposed Action would have minimal impacts within a one-mile vicinity around the APE. All construction for this undertaking would follow the existing Air Force Corporate Facility Standards, Installation Facility Standards, and Nellis AFB architectural compatibility guidelines to ensure consistent and coherent architectural character throughout the Installation. The Proposed Action is not anticipated to result in any significant direct or indirect impacts on visual resources. Noise levels from the Proposed Action would be similar to those currently experienced at Nellis AFB and is not anticipated to result in any significant direct or indirect impacts on any noise-sensitive receptors in the area. The Proposed Action would generate temporary emissions during construction activities; however, emissions from operational activities are not anticipated to result in any significant direct or indirect impacts on regional air quality.

Nellis AFB is continuing to coordinate with your office and the tribes to determine potential impacts to historic properties and properties of religious or cultural significance in the APE. Tribes included in the coordination efforts include the following: Benton Paiute Indian Tribe, Big Pine Indian Tribe, Bishop Paiute Tribe, Chemehuevi Indian Tribe, Colorado River Indian Tribes, Duckwater Shoshone Tribe, Fort Independence Indian Tribe, Kaibab Band of Southern Paiutes, Lone Pine Paiute-Shoshone Tribe, Ely Shoshone Tribe, Moapa Band of Paiutes, Paiute Indian Tribe of Utah, Timbisha Shoshone Tribe, Yomba Shoshone Tribe, and the Pahrump Paiute Tribe. Nellis AFB is awaiting feedback from the tribes on the Proposed Action. If any comments are received, Nellis AFB would forward comments to your office for your consideration.

Nellis AFB is continuing to coordinate with your office and the tribes to determine potential impacts to historic properties and properties of religious or cultural significance in the APE. Most (98 percent) of the east-side development area has been surveyed previously for cultural resources. A cultural resources survey was conducted for an unsurveyed portion of the APE to provide additional information for the analysis of the potential impacts in this EIS. This included surveying 15 acres of Nellis AFB property in response to the planned east-side development activities and reviewing the Nevada Cultural Resources Information System database, Nellis AFB records, the *National Register of Historic Places* (National Register), and General Land Office records. There are approximately 45 acres that still need to be surveyed. The Air Force is planning to survey the remaining 45 acres and Nellis AFB will provide the findings of this survey to your office and the tribes to solicit your feedback. Surveys and literature reviews conducted in the past determined that there are no historic properties or archaeological materials in the APE, and no materials or properties had been determined eligible for listing on the National Register (**Tables 1–3**). Once all pertinent information regarding the project area is known, Nellis AFB will initiate consultation with your office and the tribes.

Table 1.
Archaeological Sites within the APE

Site Number	Age	Description	NRHP Eligibility
CK4859	Prehistoric	Rock Feature	Not Eligible
CK4978	Historic	Trash Scatter	Not Eligible
CK4979	Historic	Rest Stop	Not Eligible
CK4980	Prehistoric	Lithic Scatter	Not Eligible
CK4992	Historic	Can Scatter	Not Eligible
CK5009	Historic	Telecommunication Line	Not Eligible
CK5717	Historic	Artifact Scatter	Not Eligible
CK5718	Historic	Artifact Scatter	Not Eligible
CK5719	Historic	Rest Stop/Artifact Scatter	Not Eligible
CK11269	Historic	Can Scatter	Not Eligible

Table 2.
Architectural Resources within the APE

Site Number	Description	NRHP Eligibility
B16701	Air Passenger Terminal	Not Eligible
B16703	Aircraft Maintenance Shop	Not Eligible
B16704	Avionics Science Laboratory	Not Eligible
B16705	Avionics Science Laboratory	Not Eligible

Table 3.
In-Process Sites within the APE

Site Number	Age	Description	NRHP Eligibility
S1827	Historic (Structure)	Live Ordinance Loading Area (LOLA)	Unevaluated
S3065	Historic (Structure)	Maintenance Dirt Road	Not Eligible
S3066	Historic (Structure)	Maintenance Dirt Road	Not Eligible

Should you have any questions about the project or want to arrange a meeting to discuss the Proposed Action, please contact the Nellis AFB Interim Cultural Resources Program Manager, Mike Atkin, via email at michael.atkin@us.af.mil or by phone at 702-652-7639. So that we remain on schedule to complete the environmental impact analysis process in a timely manner, please provide your response no later than 30 days from receipt of this correspondence.

The Air Force invites you to attend the public scoping meeting listed below. The public scoping meeting will be held in an open house format providing additional information about the Proposed Action and inviting comments on the Air Force's proposal.

Cora Coleman Senior Center
2100 Bonnie Lane
Las Vegas, Nevada 89156

November 14 and 15, 2023
5:00 p.m. to 7:00 p.m. (local time)

Additional notification will be sent when the Draft EIS is completed and we will provide information about the public comment period, during which you may make comments on the Draft EIS.

The Air Force appreciates your interest in and support of its military mission. We thank you in advance for your assistance and look forward to your response.

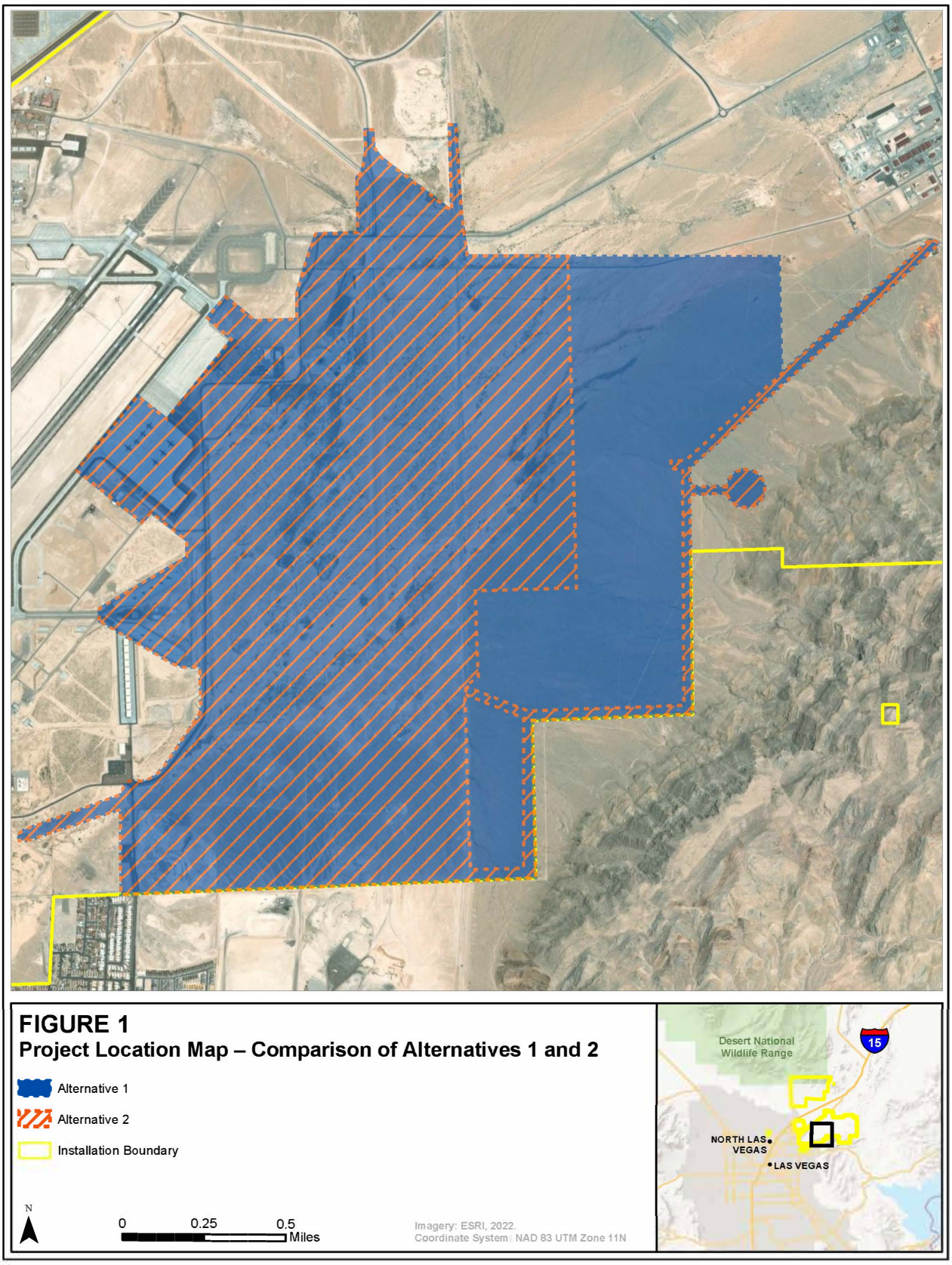
Sincerely,

Jenny L. Gibson

JENNY L. GIBSON, Lt Col, USAF
Commander

Attachment:
1. Project Location Map – Comparison of Alternatives 1 and 2

Attachment 1: Project Location Map – Comparison of Alternatives 1 and 2



Comment # 1

From: Brendon Grant
Agency: Nevada Division of Environmental Protection NDEP
Title:
Phone: 775-687-9524
Email: bgrant@ndep.nv.gov
Date Received: 11/03/2023

Any expansion of the public water system at Nellis AFB (NV0003028) shall be reviewed and approved by the Bureau of Safe Drinking Water prior to construction. For questions regarding this process, please contact Brendon Grant at 775 687-9524 or bgrant@ndep.nv.gov.

United States Department of the Interior

NATIONAL PARK SERVICE
NATIONAL TRAILS
1100 Old Santa Fe Trail
Santa Fe, New Mexico 87505

IN REPLY REFER TO:
1.D (NTIR)
November 15, 2023

Daniel Fisher
2222 S 4th Avenue
Yuma, AZ 85366

Subject: Master Plan and Installation Development at Nellis Air Force Base

Dear Mr. Fisher,

Thank you for the opportunity to comment on the notice of intent to prepare an environmental impact statement for the Master Plan and Installation Development at the Nellis Air Force Base. The Old Spanish National Historic Trail (NHT), which intersects the Nellis Air Force Base, is co-administered by the National Park Service (NPS) National Trails Office, and the Bureau of Land Management (BLM). As co-administrators, both agencies are able to provide expertise as it pertains to project impacts to trails-related resources. We request that the NHT be taken into consideration in the analysis of impacts.

We look forward to further engagement on this project as it develops. Should you have any questions or data requests, please contact Jordan Jarrett (jordan_jarrett@nps.gov), archeologist with the National Trails Office, or Rob Sweeten (rsweeten@blm.gov).

Sincerely,
CAROLE WENDLER
Digitally signed by CAROLE WENDLER
Date: 2023.11.15 13:00:17 -07'00'
Carole Wendler
Acting Superintendent
National Trails Office, National Park Service

REGION 9
SAN FRANCISCO, CA 94105

November 15, 2023

Daniel Fisher
Nellis Air Force Base Master Plan
P.O. Box 6257
Yuma, Arizona 85366

Subject: Scoping comments for the Master Plan and Installation Development at Nellis Air Force Base, Nevada

Dear Daniel Fisher:

The U.S. Environmental Protection Agency has reviewed the Notice of Intent published on October 19, 2023 regarding the Department of the Air Force's decision to prepare an Environmental Impact Statement for the subject project. Our comments are provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508) and our NEPA review authority under Section 309 of the Clean Air Act.

The Proposed Action is development of the east side of Nellis Air Force Base, including support facilities and infrastructure, to address current mission constraints and future mission growth. We have the following suggestions for your consideration when preparing the Draft Environmental Impact Statement (DEIS):

Air Quality

The DEIS should provide a brief discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS) and nonattainment areas, and potential air quality impacts of the project and alternatives. Emissions should be estimated for the construction phase, including emissions from construction vehicles and transportation. Identify probable routes for construction traffic on nearby roadways and indicate whether project truck traffic will pass near or through any communities with environmental justice concerns.

Nellis AFB is located in an area designated nonattainment (moderate) for the 8-hour ozone NAAQS (2015 standard); therefore, it is important to reduce emissions of oxides of nitrogen (NOx) and volatile organic compounds (VOCs) as much as possible, especially during construction. In general, NOx emissions can be minimized by requiring the use of high-efficiency equipment (i.e. require nonroad trucks and construction equipment to meet, or exceed, the U.S. EPA Tier 4 exhaust emissions standards for heavy-duty nonroad compression-ignition engines), proper maintenance of equipment, shutting off engines when not in use and prohibiting idling for more than 5 minutes or within 1,000 feet of sensitive

receptors, and exploring the use of lower-emitting equipment, engines and fuels, including electric, liquified gas, hydrogen fuel cells, and/or alternative diesel formulations if feasible. Other mitigation measures could include timing construction activities to not coincide with peak-hour traffic and reducing construction-related trips of workers by encouraging ridesharing and transit use.

General Conformity

Because the proposed project is located in a nonattainment area, the DEIS should address the applicability of Clean Air Act Section 176 and EPA's general conformity regulations at 40 CFR Parts 51 and 93. Federal agencies need to ensure that their actions, including construction emissions subject to state jurisdiction, conform to an approved implementation plan. Nellis AFB is also located in a maintenance area for particulate matter less than 10 microns (PM_{10})(redesignated on November 5, 2014) and carbon monoxide (CO) (effective date September 27, 2010). General conformity also applies to maintenance areas. Twenty years after these dates, general conformity for PM_{10} and CO will no longer be applicable.

Water Resources

Avoid surface waters

The development area contains intermittent streams that flow from the Sunrise Mountain area to eventually feed into the Las Vegas Wash. We recommend avoiding development in these areas and providing a buffer around these intermittent streams to allow for unimpeded flows. A wide buffer should be considered to accommodate precipitation extremes we are now experiencing under climate change.

Stormwater

The DEIS should identify the measures that would be adopted to demonstrate how stormwater flows from increases in impervious surfaces will be addressed to prevent flow increases above pre-development levels, consistent with Section 438 of the Energy Independence and Security Act. This section specifies that the sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property regarding the temperature, rate, volume, and duration of flow. Federal agencies can comply with Section 438 by using a variety of stormwater management practices often referred to as "green infrastructure" or "low impact development" practices, including, for example, reducing impervious surfaces, using vegetative practices, porous pavements, cisterns and green roofs. If bioretention is utilized to comply with EISA Section 438, the Air Force may want to consult EPA's new *Bioretention Design Handbook*[1] which includes information about the latest approaches and lessons learned for bioretention design, construction, inspection, and operation and maintenance. This is especially important because the area just downstream from the project site is in the 100-year floodplain and if runoff is increased, it could affect this floodplain and impact nearby residences.

[1] Available at https://www.epa.gov/system/files/documents/2023-11/bioretentiondesignhandbook_plainnov2023.pdf

Climate Change

Planning for Extreme Heat

Heat is a serious climate change effect that can be fatal. According to the FEMA National Risk Index, Clark County has a very high risk for extreme heat, with annual days with maximum temperature over 90 degrees predicted between 134 and 141 by midcentury, and annual days with temperature over 100 degrees between 74 and 81 days per year.

We strongly recommend the Installation Development be designed to minimize excessive heat by integrating heat mitigation strategies into site plans. Use cool surfaces and pavements that store less heat than traditional pavements. Heat islands, areas dominated by hard surfaces and lacking trees and green space, can be more than 20 degrees hotter than nearby areas with trees and grass. Use of vegetation cools surrounding areas through evapotranspiration.

Provide a certain amount of shading through either trees or built shade structures. Orient buildings with local climate and geographic conditions in mind which can improve natural ventilation, avoid solar heat gain, decrease energy usage, and improve human thermal comfort. On building sides with high solar exposure, improvements such as shade screens, window glazing, and smaller windows on the east and west sides can help shade and keep the inside of buildings cooler.[2] We recommend integrating in as many design elements as possible into the projects to help Nellis AFB reduce excessive heat health risks. See also EPA's Adaptation Resource Center[3] for additional information on climate change resiliency and adaptation measures.

Executive Order 14057: Carbon pollution-free electricity generation

Nellis AFB is a high solar resource area. While Nellis AFB has existing solar energy arrays, it should not miss the opportunity that hundreds of acres of new buildings and parking lots offer for the installation of additional photovoltaics. This is consistent with E.O. 14057 which requires agencies to facilitate new carbon pollution-free electricity generation and energy storage capacity by authorizing use of their real property assets, such as rooftops, parking structures, and adjoining land. Installing photovoltaics on carports over parking lots, such as those at Marine Corps Air Station Miramar, are especially advantageous since they also minimize heat impacts to drivers. Maximum energy efficiency should also be integrated into project designs.

Environmental Justice

To comply with E.O. 12898, Nellis AFB may want to utilize the information in the EPA tool EJ Screen. EJScreen is EPA's nationally consistent environmental justice screening and mapping tool that offers a variety of powerful data and mapping capabilities that enable users to understand details about the population of an area and its environmental conditions. The tool provides information on environmental and socioeconomic indicators. Based on EJScreen data, it appears that the off-base housing community to the south, Sunrise Manor, has a majority hispanic population. We appreciate that the project website allows for scoping comments to be submitted in Spanish. We recommend the Air Force ensure the community understands the project, such as also providing project information and outreach in Spanish.

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[2] See: https://planning-org-uploaded-media.s3.amazonaws.com/publication/download_pdf/PAS-Report-600-r1.pdf

[3] See https://www.epa.gov/arc-x/planning-climate-change-adaptation

Hazardous Materials/Waste

Identify hazardous contaminants, if any, that are associated with the development sites and provide a general overview of the status of any cleanup that is occurring on the sites. If there are any remediation projects, explain how the proposed development would interface with the cleanup remedies. The DEIS should indicate whether the physical development of the proposed action could expose construction and maintenance workers, visitors, occupants, or ecological systems to potential hazards associated with contaminants.

The EPA appreciates the opportunity to comment on preparation of the DEIS. Once the DEIS is released for public review. When the Draft EIS is released for public review, please send an electronic copy to me at vitulano.karen@epa.gov. If you have questions, please contact me at (415) 947-4178 or by email.

Sincerely,

KAREN VITULANO

Digitally signed by KAREN VITULANO
Date: 2023.11.15 11:41:00 -08'00'

Karen Vitulano
Environmental Scientist
Environmental Review Branch

NEVADA
STATE HISTORIC PRESERVATION OFFICE

STATE OF NEVADA
Department of Conservation and Natural Resources

Joe Lombardo, *Governor*
James A. Settelmeyer, *Director*
Rebecca L. Palmer, *Administrator*

November 28, 2023

Jenny L. Gibson, Lt Col, USAF
Commander, 99th Civil Engineer Squadron
6020 Beale Avenue
Nellis AFB NV 89191-6520

RE: Initiation of Consultation for the Master Plan and Installation Development Activities at Nellis Air Force Base, Clark County (2024-7973; 34997).

Dear Colonel Gibson:

The Nevada State Historic Preservation Office (SHPO) acknowledges receipt of the United States Air Force (USAF) letter initiating consultation with the office on the Master Plan and Installation Development activities at the Nellis Air Force Base (AFB).

Undertaking Description:
The undertaking includes development of the east side of the flightline at Nellis AFB to address current mission constraints and future mission growth. The location of the proposed action is illustrated in Attachment 1.

Area of Potential Effects (APE):
The USAF determined that the "direct APE" for the undertaking is on the east side of the Nellis AFB flightline as depicted in Attachment 1. The USAF has also determined that the undertaking is unlikely to result in any significant visual, audible, or atmospheric effects within a one-mile vicinity around the APE. This area is not depicted in Attachment 1.

This APE appears to be defined by the physical effects of the undertaking that would alter the current land use. The APE should also be defined and encompass the direct visual, audible, atmospheric effects as well the potential indirect and cumulative effects of the undertaking.

The SHPO is unable to evaluate this discussion of effects as the documentation does not include descriptions of the scale or size of the new construction, any demolitions that might be required of the existing built environment, and how the USAF arrived at the one-mile buffer identified in the submission to address the visual, audible, and atmospheric effects of the undertaking.

The SHPO looks forward to receiving additional information concerning the subject undertaking.

Sincerely,

Rebecca Lynn Palmer
State Historic Preservation Officer

APPENDIX B. PUBLIC NOTICES

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instructions to reflect a new direct-to-aviation recruitment model.

Affected Public: Individuals or households.

Frequency: On occasion.

Respondent's Obligation: Required to obtain or retain benefits.

Legal Authority: 33 U.S.C. chapter 17, subchapter 1, sections 853 and 854.

This information collection request may be viewed at *www.reginfo.gov.* Follow the instructions to view the Department of Commerce collections currently under review by OMB.

Written comments and recommendations for the proposed information collection should be submitted within 30 days of the publication of this notice on the following website *www.reginfo.gov/public/do/PRAMain.* Find this particular information collection by selecting ''Currently under 30-day Review—Open for Public Comments'' or by using the search function and entering either the title of the collection or the OMB Control Number 0648–0047.

Sheleen Dumas,

Department PRA Clearance Officer, Office of the Under Secretary for Economic Affairs, Commerce Department.

[FR Doc. 2023–23015 Filed 10–18–23; 8:45 am]

BILLING CODE 3510–22–P

COMMISSION OF FINE ARTS

Notice of Meeting

Per 45 CFR chapter XXI 2102.3, the next meeting of the U.S. Commission of Fine Arts is scheduled for October 19, 2023, at 9:00 a.m. and will be held via online videoconference. Items of discussion may include buildings, infrastructure, parks, memorials, and public art.

Draft agendas, the link to register for the online public meeting, and additional information regarding the Commission are available on our website: *www.cfa.gov.* Inquiries regarding the agenda, as well as any public testimony, should be addressed to Thomas Luebke, Secretary, U.S. Commission of Fine Arts, at the above address; by emailing *cfastaff@cfa.gov;* or by calling 202–504–2200. Individuals requiring sign language interpretation for the hearing impaired should contact the Secretary at least 10 days before the meeting date.

Dated: October 10, 2023 in Washington, DC.

Susan M. Raposa,

Technical Information Specialist.

[FR Doc. 2023–23009 Filed 10–18–23; 8:45 am]

BILLING CODE 6330–01–P

DEPARTMENT OF DEFENSE

Department of the Air Force

Notice of Intent To Prepare an Environmental Impact Statement for Master Plan and Installation Development at Nellis Air Force Base, Nevada

AGENCY: Department of the Air Force.

ACTION: Notice of intent.

SUMMARY: The Department of the Air Force (Air Force) is issuing this Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) to assess the potential social, economic, and environmental impacts associated with the proposed master plan and installation development at Nellis Air Force Base (AFB), Nevada.

DATES: A public scoping period of 30 days will take place starting from the date of the publication of this NOI in the **Federal Register**. Comments will be accepted at any time during the environmental impact analysis process; however, to ensure the Air Force has sufficient time to consider public scoping comments during preparation of the Draft EIS, please submit comments within the 30-day scoping period. The Draft EIS is anticipated in late 2024. The Final EIS and a decision on which alternative to implement is expected in late 2025.

During the scoping period, the Air Force will hold two in-person public scoping meetings: November 14 and 15, 2023, from 5:00 p.m. to 7:00 p.m., at the Cora Coleman Senior Center located at 2100 Bonnie Lane, Las Vegas, NV 89156. Both meetings are at the same location but offered on two different days to provide options to interested individuals.

ADDRESSES: All public meeting materials may be viewed on the EIS website (*https://www.nellisafbeis.com*). For those without access to a computer or the internet, copies of the scoping materials may be obtained by submitting a request to Nellis AFB Public Affairs at (702) 652–2750. Scoping comments may be submitted by one of the following methods: (1) submit a written comment in person at one of the two public scoping meetings, (2) mail a written comment to Attn: Master Plan and Installation Development at Nellis AFB, 2222 S 4th Avenue, P.O. Box 6257, Yuma, AZ 85366, and/or (3) submit a comment via the project website at *https://www.nellisafbeis.com.* For questions regarding the Proposed Action or EIS development, or to request sign language assistance at the in-person scoping meetings, contact Daniel Fisher at *daniel.fisher.26@us.af.mil* or (210) 925–2738.

SUPPLEMENTARY INFORMATION: Nellis AFB is proposing to develop the east side of the Installation. The purpose of the Proposed Action is to optimize Nellis AFB's current operational capabilities and capacity for future warfighting training and testing. The Proposed Action is needed because the current Nellis and United States Air Force Warfare Center mission sets are outpacing the ability to expand resources and capacity. In addition, the Air Force anticipates that facility requirements are likely to increase over time through normal attrition and the arrival of new missions and that the number of active duty and civilian personnel would also increase. The existing infrastructure does not meet current and future mission needs; mission capability at Nellis AFB is nearing physical capacity, and additional flightline support facilities and infrastructure are needed to meet anticipated future growth. The Proposed Action is also needed to relieve stress on facility and infrastructure constraints on the west side of the Installation. Flying units are currently sharing hangar space, which is not conducive to future mission growth. Presently, the Installation's infrastructure and utilities are a limitation to operational expansion and growth; utilities and the west-side ramp are reaching full operational capacity and must be expanded to accommodate future operations. Without expansion, the existing facilities and infrastructure at Nellis AFB would be insufficient to meet Air Force and Department of Defense current and future mission requirements.

The Proposed Action is development of the east side of Nellis AFB to address current mission constraints and future mission growth because the majority of the land available to construct facilities and infrastructure is located in the undeveloped area on the east side of the Installation. Constructed facilities and infrastructure will be grouped by functional land use category, and facilities with similar uses and mission functions will be located in the same general area. For planning purposes, the Air Force grouped similar mission activities into eight categories based on facility and infrastructure function and conservatively estimated the anticipated amount of impervious surface coverage typical of each functional category. The eight functional categories are Airfield Operations/Industrial/Light Industrial; Administrative/Small-scale Administrative; Medical/Community

Services/Community Commercial/Small-scale Retail and Service; Lodging/Residential (Accompanied and Unaccompanied); Outdoor Recreation/Open Space/Training Space; Transportation; Utilities/Infrastructure; and Existing Pavements.

In order to address facility requirements needed to support current and future mission structure changes and the associated increase in mission personnel, the Air Force is proposing two alternatives to gain functional capacity and support future mission growth at Nellis AFB: Alternative 1, complete build-out covering approximately 2,000 acres, and Alternative 2, partial build-out covering approximately 1,486 acres. The Air Force will also evaluate a No Action Alternative in the EIS. The Air Force is early in the planning process and has not yet identified a Preferred Alternative.

The EIS will provide analysis to inform decision-makers, as well as the public and tribal partners, of the potential environmental consequences and any associated mitigation, and will provide interested persons or agencies opportunities to provide their input. The environmental impacts analysis is expected to focus on potential impacts related to air emissions from construction, potential threatened and endangered species impacts from construction and habitat reduction, soil and water quality impacts from soil compaction and erosion, stormwater impacts from the increase in impervious surfaces, and potential impacts to cultural resources. Impacts to transportation may include increased traffic on and off the Installation. Permitting actions for construction, air emissions, and stormwater pollution prevention may be required. The Air Force will also consult with appropriate resource agencies and Native American tribes to determine the potential for significant impacts. Consultation will be incorporated into the preparation of the EIS and will include, but not be limited to, consultation under Section 7 of the Endangered Species Act and consultation under Section 106 of the National Historic Preservation Act. Additional analysis will be provided in the Draft EIS.

Scoping and Agency Coordination: To effectively define the full range of issues to be evaluated in the EIS, the Air Force is soliciting comments from interested local, state, and federal officials and agencies; Native American tribes; and interested members of the public and other stakeholders. Comments are requested on potential alternatives and impacts, and identification of any relevant information, studies, or analyses of any kind concerning impacts affecting the quality of the natural and/or human environment. Concurrent with the publication of this Notice of Intent, public scoping notices will be announced locally.

Mia Day,

Acting Air Force Federal Register Liaison Officer.

[FR Doc. 2023–23047 Filed 10–18–23; 8:45 am]

BILLING CODE 5001–10–P

DEPARTMENT OF DEFENSE

Office of the Secretary

Board of Regents, Uniformed Services University of the Health Sciences; Notice of Location Change for Federal Advisory Committee Meeting

AGENCY: Under Secretary of Defense for Personnel and Readiness (USD(P&R)), Department of Defense (DoD).

ACTION: Notice of change in location for Federal advisory committee meeting.

SUMMARY: On September 29, 2023, the DoD published a notice announcing the next meeting of the Board of Regents, Uniformed Services University of the Health Sciences (BoR USUHS) on October 20, 2023, from 12:30 p.m. to 5 p.m. (EST). The DoD is publishing this notice to announce that this Federal advisory committee meeting location has changed to the Cocoa Terrace Conference Room, Hershey Lodge, 325 University Drive, Hershey, PA 17033 due to challenges with the previously published meeting location.

DATES: Friday, October 20, 2023, open to the public from 12:30 p.m. to 5 p.m. (EST).

ADDRESSES: Cocoa Terrace Conference Room, Hershey Lodge, 325 University Drive, Hershey, PA 17033. The meeting will be held both in-person and virtually. Members of the public wishing to attend the meeting in-person or virtually should contact Ms. Angela Bee via email at *bor@usuhs.edu.*

FOR FURTHER INFORMATION CONTACT: Ms. Annette Askins-Roberts, Designated Federal Officer (DFO), at (301) 295–3066, or *bor@usuhs.edu.* Mailing address is 4301 Jones Bridge Road, Bethesda, MD 20814. Website: *https://www.usuhs.edu/ao/board-of-regents.*

SUPPLEMENTARY INFORMATION: Due to circumstances beyond the control of the Department of Defense and the Designated Federal Officer, the BoR USUHS was unable to provide sufficient public notification required by 41 CFR 102–3.150(a) regarding the change in location of its October 20, 2023 meeting. Accordingly, the Advisory Committee Management Officer for the Department of Defense, pursuant to 41 CFR 102–3.150(b), waives the 15-calendar day notification requirement.

Dated: October 12, 2023.

Aaron T. Siegel,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

[FR Doc. 2023–23012 Filed 10–18–23; 8:45 am]

BILLING CODE 6001–FR–P

DEPARTMENT OF DEFENSE

Office of the Secretary

[Docket ID: DoD–2023–OS–0099]

Manual for Courts-Martial; Proposed Amendments

AGENCY: Joint Service Committee on Military Justice (JSC), Department of Defense (DoD).

ACTION: Notice of availability of proposed amendments to the Manual for Courts-Martial (MCM), United States (2024 ed.), supplementary materials, and notice of public meeting.

SUMMARY: The DoD requests comments on proposed changes to the MCM, United States (2024 ed.) and its supplementary materials and announces a public meeting to receive comments on said changes. The approval authority for the changes to the MCM is the President, while the approval authority for the changes to the supplementary materials is the General Counsel of the DoD.

DATES: Comments on the proposed changes must be received no later than December 18, 2023. A public meeting to receive comments concerning the proposed changes will be held on November 14, 2023, at 10:00 a.m. in the Court of Appeals of the Armed Forces building, 450 E St. NW, Washington, DC 20442–0001 with an option for remote attendance. Details on remote attendance will be posted at least 7 days in advance of the meeting at *https://jsc.defense.gov/Military-Law/Current-Publications-and-Updates/.*

ADDRESSES: The proposed changes to the MCM (2024 ed.) can be reviewed at *https://jsc.defense.gov/Military-Law/Current-Publications-and-Updates/.* You may submit comments, identified by docket number and title, by any of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the instructions for submitting comments.
- *Mail:* Department of Defense, Office of the Assistant to the Secretary of

▶ LAKE MEAD

Continued from Page 1B

levels," Bureau of Reclamation Commissioner Camille Calimlim Toutonfi said in a statement Wednesday.fi

Lake Mead and Lake Powell recently dropped to about 25 percent capacity, dangerously close to endangeringfi water users and electricity generation.fi

Several factors are workingfi together to overcome more thanfi 20 years of decreasing water flows,fi including:fi

■ Winter snowmelt was 145 percent above normal, allowing Lakefi Mead to rise to 34 percent full withfi Lake Powell at 37 percent.fi

■ Rules that regulated water usefi for decades are being reworked.fi Current guidelines established infi 2007 expire at the end of 2026, butfi prolonged drought conditions thatfi sharply cut water flows "pose unacceptable risks to routine operations offi Glen Canyon and Hoover dams," saysfi the revised document released thisfi week. The hope is to have new guidelines in place as soon as possible.fi

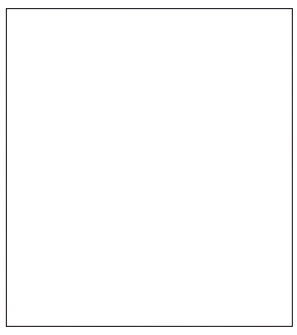
■ The Bipartisan Infrastructurefi Law is providing more than $8 billion to help fund improvements andfi efficiencies in water systems overfi the next five years.fi

■ The three lower basin statesfi — Nevada, California and Arizonafi — collectively developed a plan tofi conserve 3 million acre-feet by 2026,fi a decline of 14 percent across thefi Southwest. The three states alreadyfi have saved a million acre-feet, according to Southern Nevada Waterfi Authority spokesman Bronson Mack.fi

■ In Nevada, consumptive waterfi usage is on track to be 200,000 acre-feet by the end of 2023. It's the lowest in any year since the 1990s, Mackfi said. Last year's usage was 223,000fi acre-feet. Under current rules, thefi state is allowed to use 275,000 acre-feet annually. The amount not usedfi will be stored in Lake Mead, as wellfi as any unused water allotments forfi California and Arizona.fi

The lake stood at nearly 1,066 feetfi above sea level Thursday at Hooverfi Dam, about a foot off where it wasfi exactly two years ago. The springfi runoff and outflow from Glen Canyon Dam has raised the lake levelfi about 22 feet since mid-March.fi

"Last season we were genuinelyfi worried that boating at Lake Meadfi might be over," said Vance Randall,fi a veteran of 15 years of boating on fi



Above-normal winter snowmelt allowed Lake Mead to rise to 34 percent full.

Benjamin Hager
Las Vegas Review-Journal

the lake. "After the summer, we feelfi like boating at Lake Mead will befi around for a long time."fi

Nevada water reductions

Reduced water use in Nevada isfi coming from many avenues of conservation, Mack said. The two mainfi avenues are better adherence to seasonal watering restrictions and thefi consistent removal of grass in favorfi of drip-irrigation landscaping.fi

"Two years ago we had aboutfi 50 percent (of residents) followingfi water restrictions. Now it is aboutfi 75 percent," he said.fi

Any removal of grass leads to afi permanent reduction of water use,fi Mack noted, adding that it takesfi a column of water 10 feet deep tofi annually water a square foot of grassfi while drip irrigation requires lessfi than a 3-foot column per year.fi

Other measures coming into playfi this year and going forward includefi a restriction on the size of homefi swimming pools, decreased waterfi allotments for golf courses and afi prohibition on new installations offi evaporative cooling systems.fi

The weather in 2023 was also afi help, Mack said.fi

"We had a lot of good rainy daysfi and some good monsoon days," hefi said. "That allows people to reducefi or turn off outdoor watering, butfi it also cools the environment, andfi evaporative cooling systems that arefi working to cool indoor spaces don'tfi have to work as hard."fi

Southern Nevada has been a worldfi leader in water conservation forfi decades, Mack noted, but changingfi conditions on the Colorado Riverfi mean more must be done.fi

"We continue to find inefficiencies in water use and put togetherfi programs, policies or procedures tofi make that inefficiency more efficient," he said. "We simply have tofi implement a strategy to use less."fi

Contact Marvin Clemons at mclemons@reviewjournal.com.

Bundy son files suit over 2014 standoff

Alleged he was subject to false imprisonment

By Katelyn Newberg
Las Vegas Review-Journalfi

The son of Nevada rancher Clivenfi Bundy filed a lawsuit against the federal government this week, allegingfi that he was subject to false imprisonment and malicious prosecutionfi in connection with the 2014 armedfi standoff near Bunkerville.fi

The lawsuit was filed on behalffi of Ryan Bundy, his wife, their sixfi children and Ryan Payne, a Montanafi militia leader who the governmentfi alleged helped the Bundys in a conspiracy to assault law enforcementfi officers near the Bundy Ranch.fi

District Judge Gloria Navarro dismissed the criminal case in 2018, afi decision that was upheld by the 9thfi U.S. Circuit Court of Appeals twofi years later.fi

Cliven Bundy has been fightingfi the federal government for decadesfi over grazing rights for his cattle onfi federal land. An armed standoff occurred in 2014 when federal agentsfi tried to execute a court order tofi round up the cattle, but the encounter ended without injury after Bureau of Land Management officialsfi called off the roundup.fi

Those who came to support thefi Bundys in 2014 included right-wingfi militia members within the anti-government movement, including members of the extremist Oathfi Keepers organization.fi

Ryan Bundy said in a recent phonefi interview that he believes federalfi agents intentionally tried to provokefi his family and wanted to harm them.fi "The government in their corruption,fi they prosecuted us wrongfully," hefi said. "They used lies and manipulations, they used false witness and theyfi hid testimony. They hid evidence."fi

The case was dismissed after thefi judge found that prosecutors improperly withheld evidence including video surveillance, maps and FBIfi interview information.fi

Attorney Bret Whipple, who filedfi Ryan Bundy's lawsuit and previouslyfi represented Cliven Bundy during trial, declined to comment on the case.fi

Ryan Bundy's lawsuit includesfi multiple references to a 2017fi memo sent to the U.S. Departmentfi of Justice by a BLM investigator,fi which claimed that the investigationfi into the standoff was marred withfi misconduct that could have beenfi considered exculpatory evidence.fi

The memo and Ryan Bundy'sfi lawsuit claimed that BLM officersfi referred to the Bundys in profanefi and sexually inappropriate terms,fi and bragged about roughing upfi Dave Bundy, another one of Clivenfi Bundy's sons.fi

The lawsuit also claimed they werefi subject to "stereotyping and subsequent prosecution" because theyfi are members of the Church of Jesusfi Christ of Latter-Day Saints.fi

"The government employees'fi unlawful arrest, detainment andfi incarceration of the Plaintiffs alsofi precluded them from freely practicing their faith and attending weekly family worship services/ otherfi church events," the lawsuit said.fi

The U.S. Attorney's Office for thefi District of Nevada declined to comment on the lawsuit. A spokeswoman for the FBI's Las Vegas field officefi declined to comment.fi

Two more of Cliven Bundy's sons, fi Mel and Dave Bundy, are parties infi a similar lawsuit against the federalfi government filed in February 2020fi that is still being litigated, courtfi records show.fi

The Bundys continue to allowfi their cattle to graze on land in thefi Gold Butte National Monument,fi which is comprised of 300,000fi acres of desert sacred to the Moapafi Band of Paiute Indians and the Lasfi Vegas Paiute Tribe.fi

"We're not going to remove ourfi cattle, we're going to ranch into fi perpetuity, till the end of time,"fi Ryan Bundy told the Review-Journal on Wednesday. fi

Contact Katelyn Newberg at knewberg@reviewjournal.com.

APPENDIX C. AIR QUALITY ANALYSIS

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Air Quality Analysis Methodologies

The following information is provided for additional detail on the methodologies used in the impact analysis.

Analytical Methodology

Construction

Construction emissions were quantified based on construction footprints. Most construction projects were calculated to be complete within 12 months of the year it is programmed (e.g. if a project is planned for implementation in FY 2026, the construction is assumed to occur between January and December 2026). The following projects were assumed to occur over more than 12 months as indicated:

- Apron Complex – the apron (approximately 596,700 s.f.) is assumed to be completed over a 3-year period.
- Realign East Side Road – assumed to be completed over a 2-year period.
- Construction of parking lots for vehicles (2,800 stalls) - assumed to be completed over a 2-year period.

The following assumptions were used for construction projects:

- New building foundations require excavation of at least 1 foot of grade soil.
- Airfield pavements require excavation of at least 3.5 feet of grade soil.
- For the purposes of calculating emissions based on building volume (cubic feet), buildings are assumed to have an average height of 14 feet to account for some variation in the heights across all the proposed projects.
- Sidewalks for new buildings are assumed to be 10 percent of the new building footprint square footage.
- New impervious surfaces are assumed to be concrete or asphalt.
- 25% of the total acreage grading was used as the maximum daily acreage.Haul truck capacities vary based on material weight and range from 10-16 CY. 14 CY was used as average capacity for the construction. Worker trips for the building construction phase were calculated using a worker trip rate of 0.42 daily trips per 1,000 square feet based on the South Coast AQMD's analysis of SMAQMD Building Construction Worker and Vendor trip rates which is found in Appendix A of the CalEEMod User Guide for CalEEMod Version 2020.1.0.
- Equipment productivity rates were applied to calculate days of construction for projects. These came from published Arizona DOT and US DOT productivity files containing similar activities to those occurring in the proposed development area.

The resulting construction data were compiled and input into the ACAM 5.0.23a application to compute criteria pollutant and greenhouse gas emissions.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

b. Action Title: Nellis AFB Master Plan and Installation Development

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2026

e. Action Description:

Alternative 1 is the complete build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide the Installation with the facilities and space required to accomplish its current and long-term mission goals. Alternative 1 would fully utilize this undeveloped area to construct the facilities and infrastructure needed to meet current and future mission needs over the next decade. Development of the east side would include airfield, industrial, and administrative facilities; lodging/residential quarters; and community morale and welfare facilities to improve mission readiness. Additional utilities and infrastructure also would be installed to meet mission requirements. Alternative 1 would also include dedicated open space used for morale, welfare, recreation, and training.

Alternative 2 is the partial build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide Nellis AFB with the facilities and space required to accomplish its current and mid-term mission goals. Alternative 2 would include a reduced development footprint compared to Alternative 1, but would still address the 99 ABW's current mission constraints. Alternative 2 would allow the Installation to meet mid-term requirements for future growth and would provide access to airfield, industrial, and administrative facilities for personnel working on the east side of the Installation.

f. Point of Contact:

Name: Raul Castillo
Title: Air Quality Analyst
Organization: Stantec
Email: raul.castillo@cardno-gs.com
Phone Number:

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is 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.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, *Air Emissions Guide for Air Force Transitory Sources,* and/or other standard sources. For greater details of this analysis, refer to the Detail ACAM Report.

____ applicable
__X__ not applicable

Conformity Analysis Summary:

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	7.10		
NOx	6.43		
CO	12.78		
SOx	0.02		
PM 10	31.43	100	No
PM 2.5	0.20		
Pb	0.000		
NH3	0.053		
Las Vegas, NV			
VOC	7.10	100	No
NOx	6.43	100	No
CO	12.78		
SOx	0.02		
PM 10	31.43		
PM 2.5	0.20		
Pb	0.000		
NH3	0.053		
Las Vegas, NV			
VOC	7.10		
NOx	6.43		
CO	12.78	100	No
SOx	0.02		
PM 10	31.43		
PM 2.5	0.20		
Pb	0.000		
NH3	0.053		
Las Vegas, NV			
VOC	7.10	100	No
NOx	6.43	100	No
CO	12.78		
SOx	0.02		
PM 10	31.43		
PM 2.5	0.20		
Pb	0.000		
NH3	0.053		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2027

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	12.09		
NOx	5.33		
CO	16.91		
SOx	0.02		
PM 10	20.80	100	No
PM 2.5	0.17		
Pb	0.000		
NH3	0.039		
Las Vegas, NV			
VOC	12.09	100	No
NOx	5.33	100	No
CO	16.91		
SOx	0.02		
PM 10	20.80		
PM 2.5	0.17		
Pb	0.000		
NH3	0.039		
Las Vegas, NV			
VOC	12.09		
NOx	5.33		
CO	16.91	100	No
SOx	0.02		
PM 10	20.80		
PM 2.5	0.17		
Pb	0.000		
NH3	0.039		
Las Vegas, NV			
VOC	12.09	100	No
NOx	5.33	100	No
CO	16.91		
SOx	0.02		
PM 10	20.80		
PM 2.5	0.17		
Pb	0.000		
NH3	0.039		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2028

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	10.75		
NOx	4.46		
CO	14.93		
SOx	0.02		
PM 10	15.29	100	No
PM 2.5	0.14		
Pb	0.000		
NH3	0.033		
Las Vegas, NV			
VOC	10.75	100	No
NOx	4.46	100	No
CO	14.93		
SOx	0.02		
PM 10	15.29		
PM 2.5	0.14		
Pb	0.000		
NH3	0.033		
Las Vegas, NV			
VOC	10.75		
NOx	4.46		
CO	14.93	100	No
SOx	0.02		
PM 10	15.29		
PM 2.5	0.14		
Pb	0.000		
NH3	0.033		
Las Vegas, NV			
VOC	10.75	100	No
NOx	4.46	100	No
CO	14.93		
SOx	0.02		
PM 10	15.29		
PM 2.5	0.14		
Pb	0.000		
NH3	0.033		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2029

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	10.96		
NOx	2.67		
CO	13.57		
SOx	0.01		
PM 10	2.43	100	No
PM 2.5	0.08		
Pb	0.000		
NH3	0.022		
Las Vegas, NV			
VOC	10.96	100	No
NOx	2.67	100	No
CO	13.57		
SOx	0.01		
PM 10	2.43		
PM 2.5	0.08		
Pb	0.000		
NH3	0.022		
Las Vegas, NV			
VOC	10.96		
NOx	2.67		
CO	13.57	100	No
SOx	0.01		
PM 10	2.43		
PM 2.5	0.08		
Pb	0.000		
NH3	0.022		
Las Vegas, NV			
VOC	10.96	100	No
NOx	2.67	100	No
CO	13.57		
SOx	0.01		
PM 10	2.43		
PM 2.5	0.08		
Pb	0.000		
NH3	0.022		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2030

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	11.90		
NOx	2.87		
CO	14.78		
SOx	0.01		
PM 10	4.03	100	No
PM 2.5	0.09		
Pb	0.000		
NH3	0.025		
Las Vegas, NV			
VOC	11.90	100	No
NOx	2.87	100	No
CO	14.78		
SOx	0.01		
PM 10	4.03		
PM 2.5	0.09		
Pb	0.000		
NH3	0.025		
Las Vegas, NV			
VOC	11.90		
NOx	2.87		
CO	14.78	100	No
SOx	0.01		
PM 10	4.03		
PM 2.5	0.09		
Pb	0.000		
NH3	0.025		
Las Vegas, NV			
VOC	11.90	100	No
NOx	2.87	100	No
CO	14.78		
SOx	0.01		
PM 10	4.03		
PM 2.5	0.09		
Pb	0.000		
NH3	0.025		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2031

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.28		
NOx	0.41		
CO	0.93		
SOx	0.001		
PM 10	0.02	100	No
PM 2.5	0.01		
Pb	0.000		
NH3	0.002		
Las Vegas, NV			
VOC	0.28	100	No
NOx	0.41	100	No
CO	0.93		
SOx	0.001		
PM 10	0.02		
PM 2.5	0.01		
Pb	0.000		
NH3	0.002		
Las Vegas, NV			
VOC	0.28		
NOx	0.41		
CO	0.93	100	No
SOx	0.001		
PM 10	0.02		
PM 2.5	0.01		
Pb	0.000		
NH3	0.002		
Las Vegas, NV			
VOC	0.28	100	No
NOx	0.41	100	No
CO	0.93		
SOx	0.001		
PM 10	0.02		
PM 2.5	0.01		
Pb	0.000		
NH3	0.002		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2032

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	1.62		
NOx	1.17		
CO	3.19		
SOx	0.004		
PM 10	0.56	100	No
PM 2.5	0.03		
Pb	0.000		
NH3	0.006		
Las Vegas, NV			
VOC	1.62	100	No
NOx	1.17	100	No
CO	3.19		
SOx	0.004		
PM 10	0.56		
PM 2.5	0.03		
Pb	0.000		
NH3	0.006		
Las Vegas, NV			
VOC	1.62		
NOx	1.17		
CO	3.19	100	No
SOx	0.004		
PM 10	0.56		
PM 2.5	0.03		
Pb	0.000		
NH3	0.006		
Las Vegas, NV			
VOC	1.62	100	No
NOx	1.17	100	No
CO	3.19		
SOx	0.004		
PM 10	0.56		
PM 2.5	0.03		
Pb	0.000		
NH3	0.006		

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

Raul Castillo, Air Quality Analyst	Apr 02 2024
Name, Title	**Date**

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

b. Action Title: Nellis AFB Master Plan and Installation Development

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2026

e. Action Description:

Alternative 1 is the complete build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide the Installation with the facilities and space required to accomplish its current and long-term mission goals. Alternative 1 would fully utilize this undeveloped area to construct the facilities and infrastructure needed to meet current and future mission needs over the next decade. Development of the east side would include airfield, industrial, and administrative facilities; lodging/residential quarters; and community morale and welfare facilities to improve mission readiness. Additional utilities and infrastructure also would be installed to meet mission requirements. Alternative 1 would also include dedicated open space used for morale, welfare, recreation, and training.

Alternative 2 is the partial build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide Nellis AFB with the facilities and space required to accomplish its current and mid-term mission goals. Alternative 2 would include a reduced development footprint compared to Alternative 1, but would still address the 99 ABW's current mission constraints. Alternative 2 would allow the Installation to meet mid-term requirements for future growth and would provide access to airfield, industrial, and administrative facilities for personnel working on the east side of the Installation.

f. Point of Contact:

Name: Raul Castillo
Title: Air Quality Analyst
Organization: Stantec
Email: raul.castillo@cardno-gs.com
Phone Number:

2. Analysis: Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is 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.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, *Air Emissions Guide for Air Force Transitory Sources,* and/or other standard sources. For greater details of this analysis, refer to the Detail ACAM Report.

____ applicable
__X__ not applicable

Conformity Analysis Summary:

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	5.62		
NOx	3.24		
CO	9.04		
SOx	0.01		
PM 10	16.75	100	No
PM 2.5	0.10		
Pb	0.000		
NH3	0.024		
Las Vegas, NV			
VOC	5.62	100	No
NOx	3.24	100	No
CO	9.04		
SOx	0.01		
PM 10	16.75		
PM 2.5	0.10		
Pb	0.000		
NH3	0.024		
Las Vegas, NV			
VOC	5.62		
NOx	3.24		
CO	9.04	100	No
SOx	0.01		
PM 10	16.75		
PM 2.5	0.10		
Pb	0.000		
NH3	0.024		
Las Vegas, NV			
VOC	5.62	100	No
NOx	3.24	100	No
CO	9.04		
SOx	0.01		
PM 10	16.75		
PM 2.5	0.10		
Pb	0.000		
NH3	0.024		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2027

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	1.70		
NOx	2.23		
CO	4.26		
SOx	0.01		
PM 10	3.99	100	No
PM 2.5	0.07		
Pb	0.000		
NH3	0.014		
Las Vegas, NV			
VOC	1.70	100	No
NOx	2.23	100	No
CO	4.26		
SOx	0.01		
PM 10	3.99		
PM 2.5	0.07		
Pb	0.000		
NH3	0.014		
Las Vegas, NV			
VOC	1.70		
NOx	2.23		
CO	4.26	100	No
SOx	0.01		
PM 10	3.99		
PM 2.5	0.07		
Pb	0.000		
NH3	0.014		
Las Vegas, NV			
VOC	1.70	100	No
NOx	2.23	100	No
CO	4.26		
SOx	0.01		
PM 10	3.99		
PM 2.5	0.07		
Pb	0.000		
NH3	0.014		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2028

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	1.12		
NOx	1.77		
CO	3.29		
SOx	0.005		
PM 10	0.73	100	No
PM 2.5	0.05		
Pb	0.000		
NH3	0.010		
Las Vegas, NV			
VOC	1.12	100	No
NOx	1.77	100	No
CO	3.29		
SOx	0.005		
PM 10	0.73		
PM 2.5	0.05		
Pb	0.000		
NH3	0.010		
Las Vegas, NV			
VOC	1.12		
NOx	1.77		
CO	3.29	100	No
SOx	0.005		
PM 10	0.73		
PM 2.5	0.05		
Pb	0.000		
NH3	0.010		
Las Vegas, NV			
VOC	1.12	100	No
NOx	1.77	100	No
CO	3.29		
SOx	0.005		
PM 10	0.73		
PM 2.5	0.05		
Pb	0.000		
NH3	0.010		

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

2029

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.66		
NOx	1.03		
CO	2.16		
SOx	0.003		
PM 10	0.06	100	No
PM 2.5	0.03		
Pb	0.000		
NH3	0.003		
Las Vegas, NV			
VOC	0.66	100	No
NOx	1.03	100	No
CO	2.16		
SOx	0.003		
PM 10	0.06		
PM 2.5	0.03		
Pb	0.000		
NH3	0.003		
Las Vegas, NV			
VOC	0.66		
NOx	1.03		
CO	2.16	100	No
SOx	0.003		
PM 10	0.06		
PM 2.5	0.03		
Pb	0.000		
NH3	0.003		
Las Vegas, NV			
VOC	0.66	100	No
NOx	1.03	100	No
CO	2.16		
SOx	0.003		
PM 10	0.06		
PM 2.5	0.03		
Pb	0.000		
NH3	0.003		

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for VOC, NOx, CO, SOx, PM 10, PM 2.5, and NH3 of 250 ton/yr (Prevention of Significant Deterioration major source threshold) and 25 ton/yr for Pb (GCR de minimis value). Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Refer to the *Level II, Air Quality Quantitative Assessment Insignificance Indicators* for further details.

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

Raul Castillo, Air Quality Analyst	Apr 02 2024
Name, Title	**Date**

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions and assess the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

b. Action Title: Nellis AFB Master Plan and Installation Development

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2026

e. Action Description:

Alternative 1 is the complete build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide the Installation with the facilities and space required to accomplish its current and long-term mission goals. Alternative 1 would fully utilize this undeveloped area to construct the facilities and infrastructure needed to meet current and future mission needs over the next decade. Development of the east side would include airfield, industrial, and administrative facilities; lodging/residential quarters; and community morale and welfare facilities to improve mission readiness. Additional utilities and infrastructure also would be installed to meet mission requirements. Alternative 1 would also include dedicated open space used for morale, welfare, recreation, and training.

Alternative 2 is the partial build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide Nellis AFB with the facilities and space required to accomplish its current and mid-term mission goals. Alternative 2 would include a reduced development footprint compared to Alternative 1, but would still address the 99 ABW's current mission constraints. Alternative 2 would allow the Installation to meet mid-term requirements for future growth and would provide access to airfield, industrial, and administrative facilities for personnel working on the east side of the Installation.

f. Point of Contact:

Name: Raul Castillo
Title: Air Quality Analyst
Organization: Stantec
Email: raul.castillo@cardno-gs.com
Phone Number:

2. Analysis: Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for Air Force actions with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is assumed to be 10 years beyond the SS emissions year or 20 years beyond SS emissions year for aircraft operations related actions.

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

GHG Emissions Analysis Summary:

GHGs produced by fossil-fuel combustion are primarily carbon dioxide (CO2), methane (CH4), and nitrous oxide (NO2). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of CO2 equivalents (CO2e). The CO2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO2. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and/or Air Emissions Guide for Air Force Transitory Sources.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of CO2e (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG (CO2e) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG (CO2e) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2026	2,422	0.083	0.124	2,460	68,039	No
2027	2,572	0.094	0.102	2,605	68,039	No
2028	2,275	0.084	0.088	2,304	68,039	No
2029	1,798	0.068	0.063	1,818	68,039	No
2030	1,980	0.075	0.071	2,003	68,039	No
2031	156	0.006	0.002	157	68,039	No
2032	493	0.019	0.013	497	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

State's Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2026	39,602,863	85,229	6,288	39,694,380
2027	39,602,863	85,229	6,288	39,694,380
2028	39,602,863	85,229	6,288	39,694,380
2029	39,602,863	85,229	6,288	39,694,380
2030	39,602,863	85,229	6,288	39,694,380
2031	39,602,863	85,229	6,288	39,694,380
2032	39,602,863	85,229	6,288	39,694,380

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2026	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2027	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2028	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2029	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2030	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2031	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2032	5,136,454,179	25,626,912	1,500,708	5,163,581,798

GHG Relative Significance Assessment:

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (yGba.e., global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the NAAQSs, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2026-2044	State Total	316,822,900	681,833	50,304	317,555,038
2026-2044	U.S. Total	41,091,633,432	205,015,293	12,005,661	41,308,654,387
2026-2044	Action	11,695	0.428	0.463	11,844
Percent of State Totals		0.0036914%	0.0000628%	0.0009205%	0.0037297%
Percent of U.S. Totals		0.0000285%	0.0000002%	0.0000039%	0.0000287%

Raul Castillo, Air Quality Analyst — Apr 02 2024

Name, Title — **Date**

AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions and assess the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions.

Report generated with ACAM version: 5.0.23a

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

b. Action Title: Nellis AFB Master Plan and Installation Development

c. Project Number/s (if applicable):

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Action-Related Annual GHG Emissions (mton/yr)						
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**	**Threshold**	**Exceedance**
2026	1,346	0.049	0.055	1,363	68,039	No
2027	755	0.027	0.031	765	68,039	No
2028	594	0.022	0.021	601	68,039	No
2029	334	0.013	0.006	336	68,039	No

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

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2029	39,602,863	85,229	6,288	39,694,380

U.S. Annual GHG Emissions (mton/yr)				
YEAR	**CO2**	**CH4**	**N2O**	**CO2e**
2026	5,136,454,179	25,626,912	1,500,708	5,163,581,798
2027	5,136,454,179	25,626,912	1,500,708	5,163,581,798
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AIR CONFORMITY APPLICABILITY MODEL REPORT
GREENHOUSE GAS (GHG) EMISSIONS

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To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

Total GHG Relative Significance (mton)					
		CO2	**CH4**	**N2O**	**CO2e**
2026-2040	State Total	158,411,450	340,917	25,152	158,777,519
2026-2040	U.S. Total	20,545,816,716	102,507,647	6,002,831	20,654,327,193
2026-2040	Action	3,029	0.111	0.112	3,065
Percent of State Totals		0.0019122%	0.0000325%	0.0004469%	0.0019306%
Percent of U.S. Totals		0.0000147%	0.0000001%	0.0000019%	0.0000148%

Raul Castillo, Air Quality Analyst — Apr 02 2024

Name, Title — **Date**

APPENDIX D. UTILITIES AND INFRASTRUCTURE ASSESSMENT

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Final

Utilities and Infrastructure Assessment for the Master Plan and Installation Development EIS at Nellis Air Force Base, Nevada

February 2024

Prepared for:
United States Air Force
57th Wing
99th Air Base Wing
65th Aggressor Squardon
422nd Test and Evaluation Squardon

Nellis Air Force Base, Nevada

Final

Utilities and Infrastructure Assessment

for the

Master Plan and Installation Development

Environmental Impact Statement

at

Nellis Air Force Base, Nevada

February 2024

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ACRONYMS AND ABBREVIATIONS

°	degree
ABW	99th Air Base Wing
ACC	Air Combat Command
AFB	Air Force Base
Air Force	United States Air Force
AT/FP	Anti-terrorism/Force Protection
BTU	British Thermal Unit
CCRFCD	Clark County Regional Flood Control District
CCWRD	Clark County Water Reclamation District
DoD	Department of Defense
FA	Forced Air
FY	Fiscal Year
GPD	gallons per day
HDPE	high-density polyethylene
I-15	Interstate 15
ITP	Information Transfer Buildings
kV	kilovolt
KWH	kilowatt hours
LOS	Level of Service
mg/L	milligram per liter
MGD	million gallons per day
MII	Micro-Computer Aided Cost Estimating System Second Generation
MVA	megavolt-ampere
NLVWD	North Las Vegas Water District
NSA	Nellis Solar Array
NTTR	Nevada Test and Training Range
NVE	NV Energy
ONAN	Oil Natural Air Natural
OSP	Outside Plant
PACES	Parametric Cost Engineering System
PFAS	per- and polyfluoroalkyl substances
psi	pounds per square inch
PV	photovoltaic
PVC	polyvinylchloride
SCADA	Supervisory Control and Data Acquisition
SNWA	Southern Nevada Water Authority
TMP	Transportation Management Plan
U.S.	United States
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USAFWC	United States Air Force Warfare Center

1.0 OBJECTIVE

The 99th Air Base Wing (99 ABW) at Nellis Air Force Base (AFB) in Nevada is proposing to develop the east side of the Installation (east-side development area) to address current operational and land use capacity constraints and to ensure that there is adequate facility and infrastructure available to accommodate future mission growth. This study focuses on the potable water, wastewater, stormwater, electrical, telecommunications, natural gas, hydrant fuel, and transportation infrastructure, in addition to associated cost estimates necessary to support these improvements at the proposed east-side development area.

The purpose of this study is to assess the impacts of the proposed facility upgrades on the east-side development area to the existing utility infrastructure. This study provides background on the existing infrastructure systems as they relate to the east-side development area, summarizes the requirements for the upgrades, identifies deficiencies in the existing systems, and provides recommendations, including cost estimates, to address the identified deficiencies.

The United States (U.S.) Air Force (Air Force), Air Combat Command (ACC) is preparing this Utilities and Infrastructure Assessment to:

- determine the capacity of existing utilities as they relate to supporting the east-side development area,
- determine the proposed demand of the east-side development area,
- identify existing deficiencies and constraint issues,
- identify cost estimates for the proposed utility infrastructure,
- support future decision-making, and
- provide information for future National Environmental Policy Act and related environmental and facility planning requirements.

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2.0 EXECUTIVE SUMMARY

2.1 PROJECT BACKGROUND AND BASIS OF ANALYSIS

Nellis AFB, located in Clark County in the southeast corner of the state of Nevada, lies 5 miles northeast of the city of Las Vegas. The Installation is bordered on the west and south by the unincorporated township of Sunrise Manor (see **Figure 3.1-1**).

Nellis AFB is proposing to reorient Nellis AFB's current operational capabilities and capacity for future warfighting training and testing. Presently, the Installation's infrastructure and utilities are a limitation to operational expansion and growth; utilities and the west-side ramp are reaching full operational capacity and must be expanded to accommodate future operations. Without expansion, the existing facilities and infrastructure at Nellis AFB would be insufficient to meet Air Force and Department of Defense (DoD) current and future mission requirements (Nellis AFB, 2018a; Air Force Civil Engineer Center, 2021).

The number of active duty mission personnel at Nellis AFB increased 12 percent from 2014 to 2021 (Nellis AFB, 2014, 2022a), and Nellis AFB is anticipating a 10 percent growth in the number of military and civilian personnel who live and work on the Installation over the next decade. This anticipated growth and expansion of mission capabilities would result in the addition of approximately 2,500 mission personnel to Nellis AFB phased over the next 10 years.

In order to address facility requirements needed to support current and future mission structure changes and the associated increase in mission personnel, the Air Force is proposing two alternatives to gain functional capacity and support future mission growth at Nellis AFB: Alternative 1, Complete Build-Out and Alternative 2, Partial Build-Out.

Alternative 1 is the complete build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide the Installation with the facilities and space required to accomplish its current and long-term mission goals (see **Figure 3.1-2**).

Alternative 2 is the partial build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide Nellis AFB with the facilities and space required to accomplish its current and mid-term mission goals. Alternative 2 would include a reduced development footprint compared to Alternative 1 but would still address the 99 ABW's current mission constraints (see **Figure 3.1-3**).

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing

facilities and infrastructure at Nellis AFB would be insufficient to meet Air Force and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

2.2 RECOMMENDATIONS

2.2.1 POTABLE WATER SYSTEM

Potable water demand for the proposed east-side development area would increase by approximately 0.3 million gallons per day (MGD), which is an approximate 18 percent increase in potable water demand compared to existing demand of 1.7 MGD (2020) (Nellis AFB, 2023b).

- To support the proposed east-side development area at full build-out, approximately 43,000 linear feet of polyvinyl chloride (PVC) water supply mains with a minimum 12-inch diameter to support fire flows would be required.
- It is proposed that water supply be interconnected/looped with Area II and the Main Base (Area I); this would alleviate existing water quality issues resulting from dead ends in the system at Area II and improve installation-wide pressure.
- The existing water distribution system is shallow (i.e., buried close to the surface), resulting in high internal temperatures in the pipes to the extent that the chlorine in the water degrades from free chlorine into other chlorine compounds not suitable for disinfection of water more quickly than a deeper buried system. It is recommended that pipes be installed at least 4 feet below grade.
- Construction of 2.0-million-gallon water storage tank would help alleviate installation-wide pressure concerns within the water system and support fire protection needs.
- Construction of an aeration system to ensure safe drinking water would assist in reducing chlorine degradation in the summer months and allow for longer water storage for mission essential needs or to address water vulnerability concerns.
- All future mission growth must consider climate impacts in relation to mission resiliency, redundancy, security, and water supply.
- There are currently several per- and polyfluoroalkyl substances (PFAS)-impacted sites, including both groundwater and shallow soil sites, within the boundary of the east-side development area with associated groundwater monitoring wells. All water and earth disturbance activities should include testing for the presence of PFAS.

To prolong the availability and use of potable water at Nellis AFB, it is recommended the following measures are considered for the proposed east-side development area to decrease potable water demand:

- Ensure proposed landscaping design is water efficient
- Ensure low-flow plumbing fixtures are integrated into the design of the new facilities
- Eliminate potable water use for outdoor irrigation
- Curtail waste by minimizing unrecoverable potable water losses
  - Termination of the Area II flushing system with a looped system that would connect the existing water supply lines from Area I and Area II
  - Implementation of hardening strategies for the water distribution system, including a deeper burial of distribution pipes
  - Improving the overall management of the distribution system by installation of a Supervisory Control and Data Acquisition (SCADA) system.

It is recommended groundwater wells 11, 12, and 14 be rehabilitated and filtered to provide an additional 575 acre-feet of potable water (Nellis AFB, 2020b). Rehabilitation of the existing wells would provide a reliable potable water back-up system to increase overall efficiency, provide operational flexibility, and buffer the potential impacts of drought conditions.

- Rebuild or re-drill existing wells to rehabilitate well infrastructure, as necessary
- Construct arsenic filter/removal plant to address arsenic contamination
- Expand backup power to ensure all wells are receiving sufficient backup power to maintain installation water supply during grid outages

2.2.2 WASTEWATER SYSTEM

Wastewater generation for the proposed east-side development area is estimated at 300,000 gallons per day (GPD) which is based on 120 GPD per person for 2,500 personnel (Nellis AFB, 2023b).

The proposed wastewater system for the east-side development area would be a separate system with a separate discharge point into the Clark County Water Reclamation District (CCWRD) Sloan Basin (Nellis AFB, 2023a); this system would not be connected to the existing system at the Main Base (Area I). Sewage conveyance trunk lines would be a minimum of 18-inch PVC with manholes placed at a minimum every 400 feet and at major junctions. Approximately 25,000 linear feet of sewage piping would be proposed to support the east-side development.

2.2.3 STORMWATER MANAGEMENT SYSTEM

The proposed stormwater system for the east-side development area would be a separate system from the Main Base (Area I) and would be composed of plastic pipes, culverts, natural swales, and concrete troughs to the proposed stormwater detention basin. The estimated increase in the amount of impervious surface would be 1,480 acres. Two stormwater management priorities for the east-side development area include:

- Diversion of offsite stormwater runoff entering the site from Sunrise Mountain
  - A reinforced berm within the fence line would be designed to safely divert stormwater runoff from Sunrise Mountain around the east-side development area toward the proposed stormwater basin.
    - Earthen structure with 3:1 side slopes;
    - 2–4 feet in height, 3–5-foot top width, 20,000 linear feet; and
    - Concrete or riprap along the eastern side of the structure.

- Management of onsite stormwater runoff increases as the result of development and associated increases in impervious surfaces.
  - A stormwater detention facility would be constructed on the southwest corner of the east-side development area. It is estimated that the basin would be 10 feet deep with a top area of approximately 20 acres.
  - A 14,000 linear foot flume would be constructed as a continuation of the existing flume previously constructed by CCWRD. The proposed flume would discharge to the proposed stormwater detention basin.

2.2.4 ELECTRICAL SYSTEM

The electrical demand for the east side development at full build-out has been approximated to be 28 megavolt-ampere (MVA). This is 133 percent greater than the existing available Northgate substation unutilized capacity.

- Installation of a new Nellis AFB-owned distribution South substation would be required in the southeast corner of the proposed east-side development area to meet excess demand. This substation and associated medium voltage distribution system would need to be installed prior to any of the east side development facility upgrades.
- The new South substation capacity would match the 40-megawatt, 69 kilovolt (kV) – 12.47Y/7.2kV rating of the existing Northgate substation. This would double the overall electrical capacity of the Installation to 80 MVA.
- NV Energy (NVE) would provide the 69 kV medium voltage electrical distribution system to the new South substation from their existing overhead sub-transmission circuit running along East Carey Avenue.
- The new South substation would have two 24/32/40 MVA (Oil Natural Air Natural [ONAN]/Forced Air [FA]/FA 55° Fahrenheit/65° Celsius) rated transformers to match transformer T1 in the Northgate substation.
- Medium voltage distribution circuits would be extended throughout the proposed areas in underground concrete encased duct banks and terminate in 15 kV, 600-amp rated, pad mount distribution switchgear located to accommodate future connections to building service transformers.

2.2.5 TELECOMMUNICATIONS SYSTEM

The total east-side development area is estimated to be 2,001 acres. To support this acreage at full build-out, two new Information Transfer Buildings (ITB) with minimum 1,000 square foot floorspace with backup generator, an Uninterruptible Power Supply (UPS) and approximately 85,000 linear feet of underground duct bank telecommunications infrastructure pathways would be required. In addition, a 288 strand Single Mode Fiber Optic Cable is required from the new ITBs to existing ITB 1740 in Area I and existing ITB 10215 in Area II to provide logical diversity.

2.2.6 NATURAL GAS SYSTEM

Natural gas demand for the proposed east-side development area would increase by a peak of approximately 1.6 trillion British Thermal Units (BTU) which is an approximate 1 percent increase compared to existing natural gas demand.

The proposed east-side development area would construct a completely independent natural gas system from the rest of the Installation. A new gas meter would be installed in coordination with Southwest Gas, which would be coordinated with the utility by the designer. Approximately 21,000 linear feet of natural gas lines that consist of 8-inch minimum high-density polyethylene (HDPE) tubing would be installed.

Under Alternative 2, natural gas demand for the proposed east-side development area would increase by approximately 1.1 trillion BTU assuming the whole year is run at peak demand, which is an approximate 0.7 percent increase compared to existing natural gas demand of 152 trillion BTU in 2022. This increase is based on peak natural gas loads estimated at a peak demand of 192 million BTU per hour based on approximately 2.4 million square feet, 40 percent less than Alternative 1.

2.2.7 HYDRANT FUEL SYSTEM

Hydrant fuel demand would be based on the number of airframes proposed to be stationed at the Installation to meet future basing scenarios. Base personnel requested approximately 2 million gallons of new hydrant fuel storage for proposed airframes, and all new tanks would be owned by Nellis AFB rather than leased.

Approximately 11,000 linear feet of 8-inch steel fuel lines and four 500,000-gallon (approximately 12,000-barrel each) tanks would be installed and connected to proposed flight line facilities for airframe use and interconnected with the existing east-side system.

2.2.8 TRANSPORTATION SYSTEM

Up to 75 percent of the additional proposed growth would live off the Installation, increasing the total gate volume across Nellis AFB by approximately 8 percent. Hollywood Gate would be the primary access gate for those personnel living on or working within the proposed east-side development area. Hollywood Gate, currently closed, would be re-opened and reconstructed to current anti-terrorism/force protection (AT/FP) standards and include construction of two lanes to accommodate A.M. (morning) and P.M. peak hour traffic.

The proposed east-side development area would construct a completely new transportation system to support the development. It is expected that most of the roadways would be constructed with a closed drainage system and include appropriate traffic calming based on the proposed design speed.

- The primary throughway for the east-side development area would be the proposed extension of Ellsworth Avenue from its current end at O'Bannon Road to Hollywood Boulevard. The roadway would be a 2-lane, paved roadway with open drainage that would provide access to the Man Base (Area I). The proposed Ellsworth Avenue would provide access to Area II via O'Bannon Road and Munitions Road.
- East-west feeder roads connected to the extended Ellsworth Avenue would be constructed to provide access to the proposed facilities under each functional area.

2.3 COST ESTIMATE

Cost estimating methodology was prepared based on limited information as this is a high-level planning analysis and subsequently the results have wide accuracy ranges. Stochastic estimating methods such as parametric models, and assembly driven models, were used for this analysis including the use of Parametric Cost Engineering System (PACES) software with Micro-Computer Aided Cost Estimating System Second Generation (MII) support. **Table 2.4-1** summarizes the cost estimate for the project.

Table 2.4-1 Infrastructure and Utility Cost Estimates for the Proposed East-Side Development Area

System	***Description***	***Cost ($000)***
Potable Water	Alternative 1 – Complete Build-Out	$22,819
	Alternative 2 – Partial Build-Out	$22,471
Wastewater	Alternative 1 – Complete Build-Out	$12,277
	Alternative 2 – Partial Build-Out	$12,277
Stormwater Management	Alternative 1 – Complete Build-Out	$118,822
	Alternative 2 – Partial Build-Out	$106,735
Electrical	Alternative 1 – Complete Build-Out	$77,650
	Alternative 2 – Partial Build-Out	$67,204
Telecommunications	Alternative 1 – Complete Build-Out	$12,360
	Alternative 2 – Partial Build-Out	$9,763
Natural Gas	Alternative 1 – Complete Build-Out	$932
	Alternative 2 – Partial Build-Out	$932
Hydrant Fuel	Alternative 1 – Complete Build-Out	$19,721
	Alternative 2 – Partial Build-Out	$19,721
Transportation	Alternative 1 – Complete Build-Out	$12,311
	Alternative 2 – Partial Build-Out	$7,859
	Total	**$523,854**

3.0 BACKGROUND AND BASIS OF ANALYSIS

Nellis AFB, located in Clark County in the southeast corner of the state of Nevada, lies 5 miles northeast of the city of Las Vegas. The Installation is bordered on the west and south by the unincorporated township of Sunrise Manor (**Figure 3.1-1**).

Nellis AFB is home to the 99 ABW, USAFWC, 57th Wing, NTTR, elements of the 53rd Wing and 505th Command Control Wing, and more than 52 tenant units and agencies. The 99 ABW is the host wing for Nellis AFB and the NTTR and is responsible for two groups: the 99th Mission Support Group and the 99th Medical Group. Nellis AFB is the center for ACC training and testing activities at the NTTR, providing logistical and organizational support, aircraft training, and personnel for the Range.

Covering 16,246 acres, the Installation contains three major functional areas (**Figure 3.1-2**). Area I, the Main Base, is located east of Interstate 15 (I-15) and includes the airfield and most Installation functions. Area II, northeast of the Main Base, contains the Munitions Storage Area/Weapons Storage Area. Area III, situated northwest of the Main Base, comprises a number of facilities such as a hospital, storage, and housing. Nellis AFB also includes a Small Arms Range, which comprises 10,623 acres of land and is disjunct from the remainder of the Installation. The Small Arms Range is located northwest of I-15 and south of the Desert National Wildlife Range. With the exception of several buildings and access roads, the Small Arms Range consists of undeveloped desert scrub land.

3.1 DESCRIPTION OF THE PROPOSED EAST-SIDE DEVELOPMENT AREA

Nellis AFB is proposing to reorient Nellis AFB's current operational capabilities and capacity for future warfighting training and testing. Presently, the Installation's infrastructure and utilities are a limitation to operational expansion and growth; utilities and the west-side ramp are reaching full operational capacity and must be expanded to accommodate future operations. Without expansion, the existing facilities and infrastructure at Nellis AFB would be insufficient to meet Air Force and DoD current and future mission requirements (Nellis AFB, 2018a; Air Force Civil Engineer Center, 2021).

The number of active duty mission personnel at Nellis AFB increased 12 percent from 2014 to 2021 (Nellis AFB, 2014, 2022a), and Nellis AFB is anticipating a 10 percent growth in the number of military and civilian personnel who live and work on the Installation over the next decade. This anticipated growth and expansion of mission capabilities would result in the addition of approximately 2,500 mission personnel to Nellis AFB phased over the next 10 years.

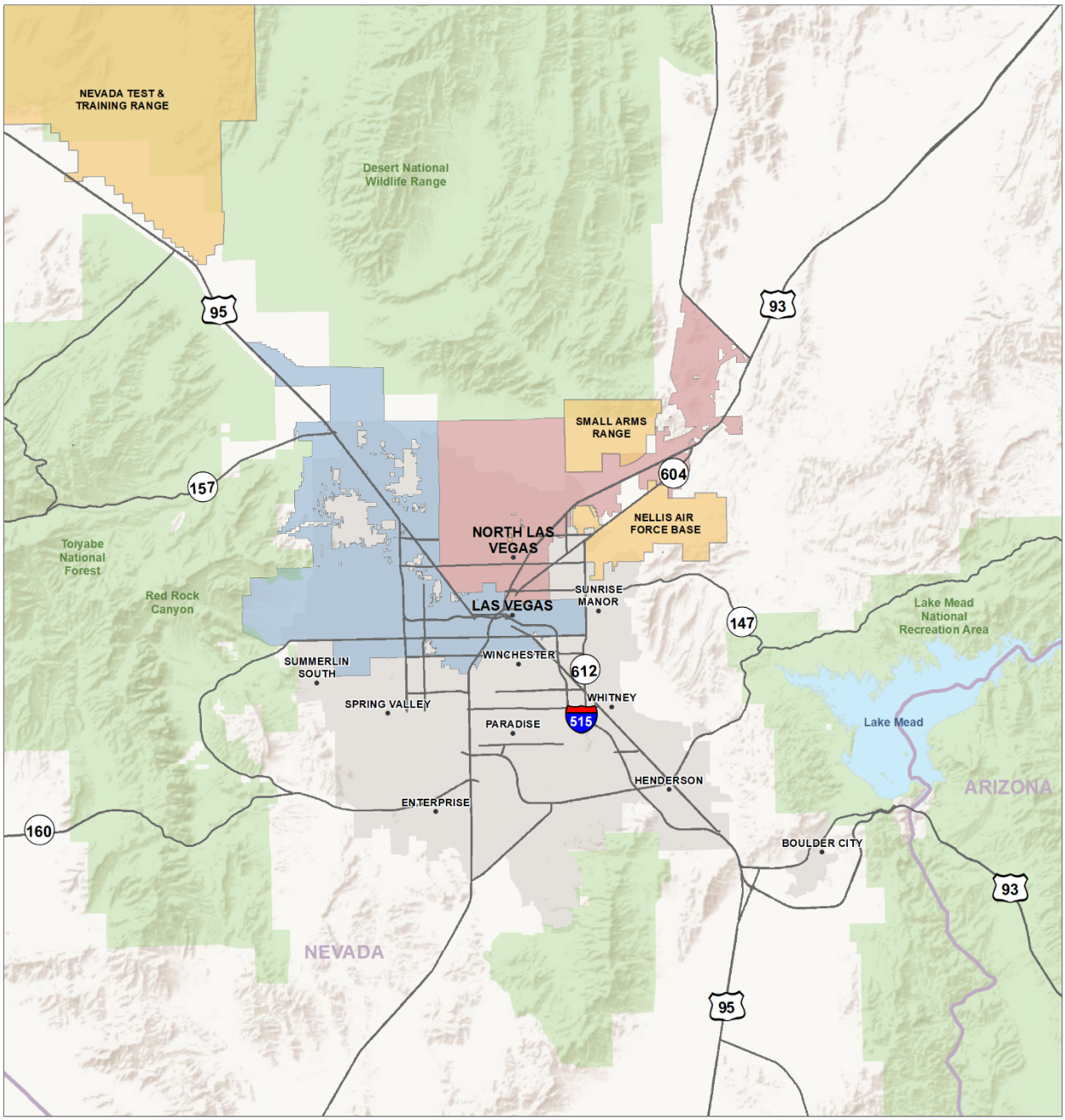


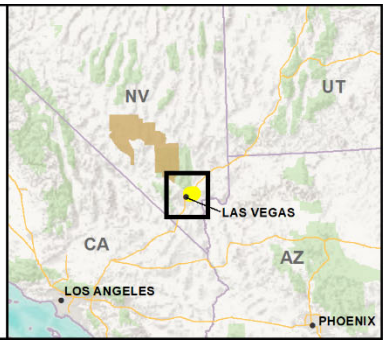
FIGURE 3.1-1
Nellis AFB and Vicinity

- City of Las Vegas
- City of North Las Vegas
- Nellis Air Force Base Properties

N

0 5 10 Miles

Coordinate System: NAD 83 UTM Zone 11N



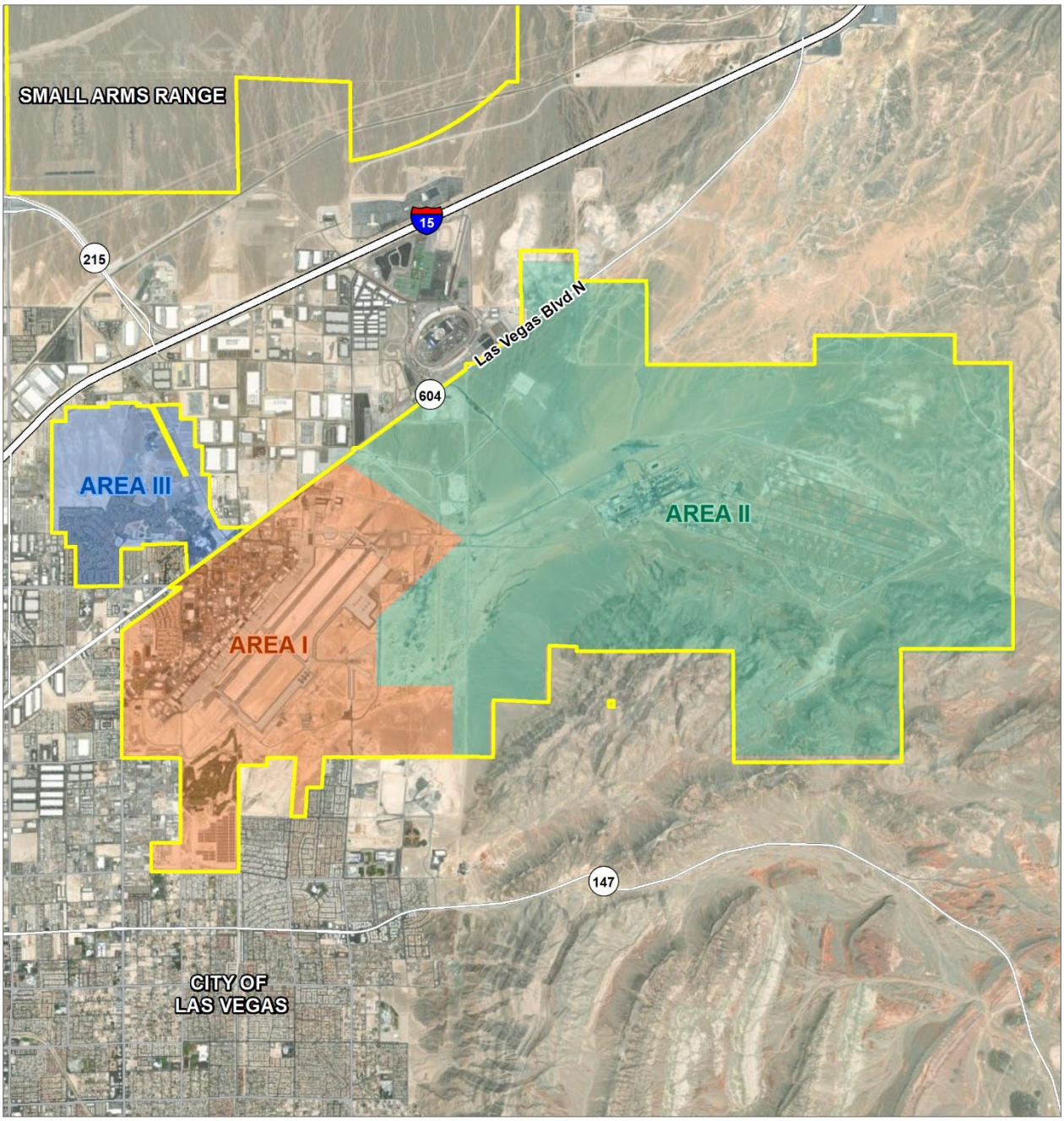
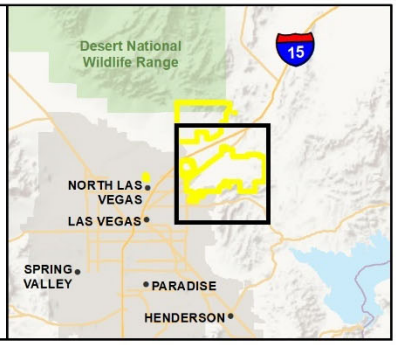


FIGURE 3.1-2
Nellis AFB Functional Areas

Installation Boundary
Interstate Highway
State Highway
Major Road
Area 1
Area 2
Area 3

N
0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



This document is a high-level planning assessment of the proposed east-side development area related to the development of the functional areas, described below. As such, estimates and assumptions (as outlined in each resource area) were used to analyze proposed infrastructure needs as exact building dimensions, including location, quantity, square feet, and capacity of the proposed facilities are unknown.

Proposed facilities and infrastructure within the east-side development area are grouped by functional land use categories where facilities with similar uses and mission functions would be located in the same general area. For planning purposes, the Air Force grouped similar mission activities into eight categories based on facility and infrastructure function and conservatively estimated the anticipated amount of impervious surface coverage typical of each functional category (**Table 3.1-1**).

Table 3.1-1 Functional Categories and Percent Impervious Surface Coverage

Functional Category	***Percent Impervious Surface Coverage***	***Typical Mission Functions***
Airfield Operations/Industrial/Light Industrial	95	Airfield and areas surrounding the airfield, launch support facilities, hangars, aircraft maintenance, control towers, passenger terminals, simulator facilities, repair and maintenance facilities, warehouses and storage facilities, engineering and maintenance shops, vehicle storage facilities, vehicle filling stations, and fire stations
Administrative/Small-scale Administrative	85	Command posts, legal offices, administrative offices, satellite command and control facilities, indoor training and academic/educational facilities, communication facilities, security forces operations, and military and family readiness facilities
Medical/Community Services/Community Commercial/Small-scale Retail and Service	85	Clinics, hospitals, dental services, pharmacies, and veterinary services
Lodging/Residential (Accompanied and Unaccompanied)	50	Dormitories (enlisted/officer bachelor housing), privatized housing, military family housing (single-family and multi-family), and temporary lodging facilities
Outdoor Recreation/OpenSpace/ Training Space	25	Undeveloped land in natural conditions not intended for future development and with minimal maintenance requirements; areas designated as undeveloped land due to natural or operational constraints such as floodplains, wetlands, quantity-distance arcs, and airfield clear zones; training functions including maneuver areas, firing ranges, and drop zones; outdoor recreational areas; and other open space regularly maintained for outdoor activities
Transportation	80	New paved roadways and security gate areas
Utilities/Infrastructure	20	Underground utility lines such as transmission, electric, water, telecommunication, wastewater, natural gas, and wastewater lines; power substations; solar farms; wastewater treatment plants, water towers, and regional pump stations; water purification systems; detention basins; and security fences
Existing Pavements	100	Existing paved surfaces such as runways, taxiways, aprons, ramps, and overruns

3.2 DESCRIPTION OF THE PROPOSED ALTERNATIVES

In order to address facility requirements needed to support current and future mission structure changes and the associated increase in mission personnel, the Air Force is proposing two alternatives to gain functional capacity and support future mission growth at Nellis AFB: Alternative 1, Complete Build-Out and Alternative 2, Partial Build-Out.

3.2.1 ALTERNATIVE 1 – COMPLETE BUILD-OUT

Alternative 1 is the complete build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide the Installation with the facilities and space required to accomplish its current and long-term mission goals. Development of the east side would include airfield, industrial, and administrative facilities; lodging/residential quarters; and community morale and welfare facilities to improve mission readiness. Additional utilities and infrastructure would also be installed to meet mission requirements. Alternative 1 would also include dedicated open space used for morale, welfare, recreation, and training.

Table 3.1-2 lists the example projects that could occur within each functional category under Alternative 1, the approximate total acreage dedicated to each functional category, and the estimated amount of impervious surface coverage that would occur under each category. **Figure 3.1-3** shows the boundaries of Alternative 1 with its associated land use functional categories.

Table 3.1-2 Alternative 1 Estimated Proposed Impervious Coverage

Functional Category	***Example Projects***	***Estimated Total Area (Acres)***	***Percent Impervious Surface Coverage***	***Estimated Impervious Surface Coverage (Acres)***
Airfield Operations/Industrial/ Light Industrial	Aprons, taxiways, ramps, traffic and cargo deployment function terminal, hangars, wash racks, aerospace ground equipment facilities, wheels and tire shops, vehicle and engine maintenance facilities, warehouses, storage facilities, and gasoline stations	866	95	823
Administrative/ Small-scale Administrative	Simulators; training facilities; auditoriums; administrative facilities; Defense Finance Accounting and Accounting Service facilities; operation facilities; and security forces, armory, and canine facilities	351	85	298
Medical/Community Services/Community Commercial/Small-scale retail and service	Fitness center and running track, shoppette, food court, commissary, and Base Exchange	120	85	102
Lodging/Residential (Accompanied and Unaccompanied)	Dormitories	37	50	18
Outdoor Recreation/Open Space/Training Space	Parks, playgrounds, sport courts, park areas, and a gunfighter drop zone training area	261	25	65

Functional Category	***Example Projects***	***Estimated Total Area (Acres)***	***Percent Impervious Surface Coverage***	***Estimated Impervious Surface Coverage (Acres)***
Transportation	New paved roads and expansion of security gates and entry areas	59	80	47
Utilities/Infrastructure	Utility corridors for electricity, water, natural gas, communications, and sewer/wastewater; expansion of stormwater drainage canal; water tank; stormwater retention pond; de-arsenic plant; water purification plant; liquid oxygen plant; pumpstations; and utility pads	224	20	45
Existing Pavements	Improvements/maintenance of existing aprons, taxiways, ramps, roads, parking lots, and stormwater drainage canal; and installing structures on existing paved surfaces such as aircraft noise abatement, aircraft covered and parking areas	82	100	82
	Total	**2,000**	**74**	**1,480**

Note: Numbers may not add up due to rounding.

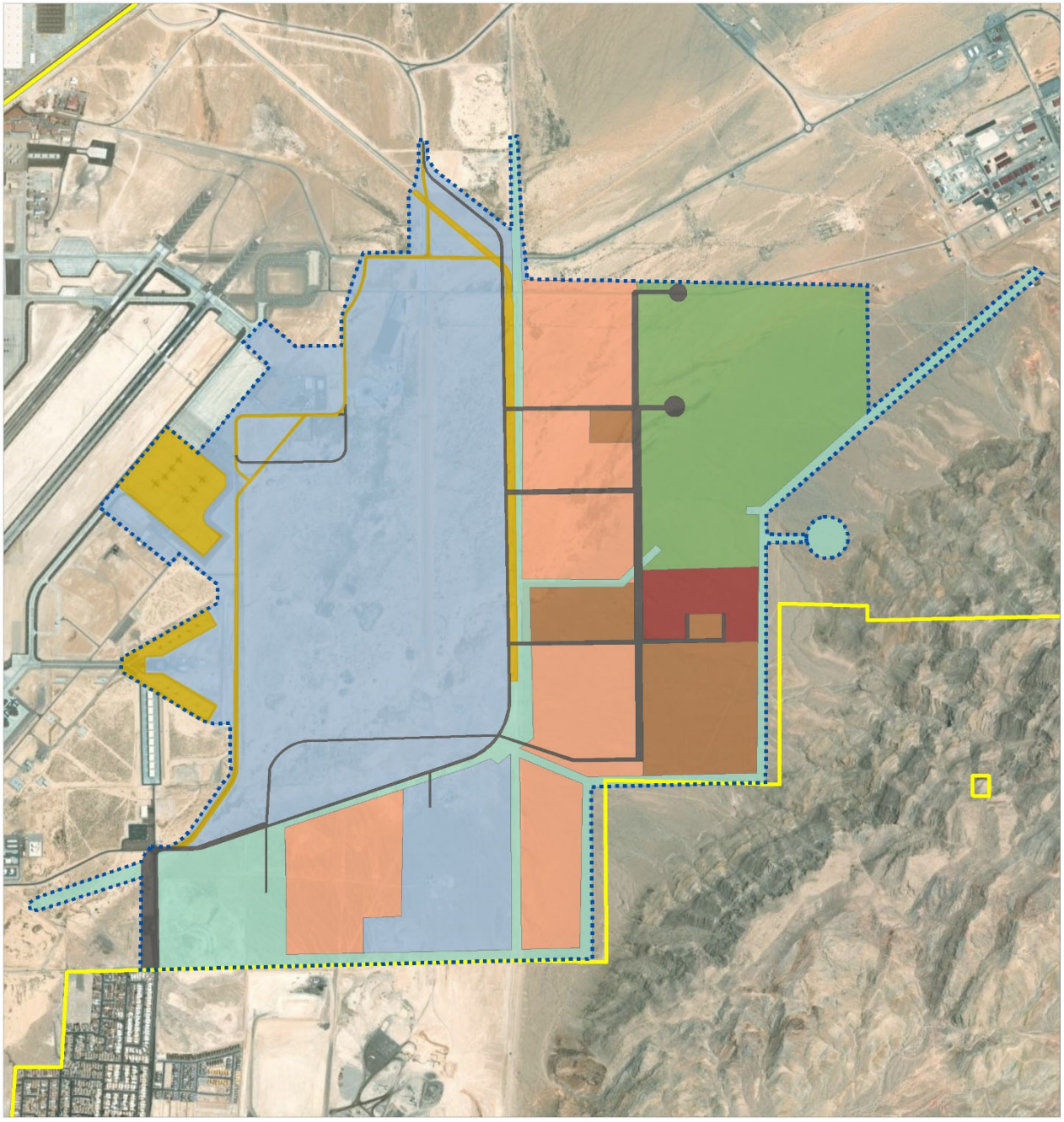


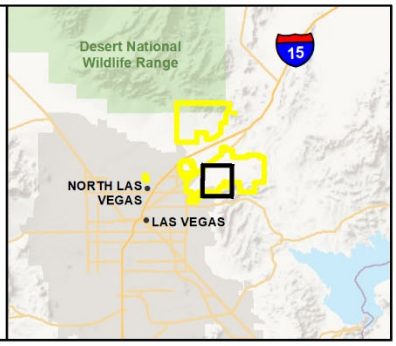
FIGURE 3.1-3
Alternative 1 - Complete Build-out Project Area with Functional Categories

- Alternative 1
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Lodging/Residential (Accompanied/Unaccompanied)
- Medical/Community Services/Community Commercial/Small-scale Retail
- Outdoor Recreation/Open Space/Training Space
- Transportation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



3.2.2 ALTERNATIVE 2 – PARTIAL BUILD-OUT

Alternative 2 is the partial build-out and development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide Nellis AFB with the facilities and space required to accomplish its current and mid-term mission goals. Alternative 2 would include a reduced development footprint compared to Alternative 1 but would still address the 99 ABW's current mission constraints.

Under Alternative 2, accompanied and unaccompanied military personnel would utilize existing on-Installation living quarters or live off the Installation; no new lodging facilities would be constructed. Additional outdoor recreation space, open space, and training space would not be designated; personnel would use existing outdoor spaces on the west side of the Installation. Personnel would utilize the fitness center, commissary, and Base Exchange on the west side of the Installation. Utilities, transportation, and infrastructure improvements under Alternative 2 would occur on a smaller scale than under Alternative 1.

Table 3.1-3 lists the functional categories included under Alternative 2. **Figure 3.1-4** shows Alternative 2 with its associated land use functional categories.

Table 3.1-3 Alternative 2 Estimated Proposed Impervious Coverage

Functional Category	*Example Projects*	*Estimated Total Area (Acres)*	*Percent Impervious Surface Coverage*	*Estimated Impervious Surface Coverage (Acres)*
Airfield Operations/Industrial/ Light Industrial	Aprons, taxiways, ramps, traffic and cargo deployment function terminal, hangars, wash racks, aerospace ground equipment facilities, wheels and tire shops, vehicle and engine maintenance facilities, warehouses, storage facilities, and gasoline stations	866	95	823
Administrative/ Small-scale Administrative	Simulators; training facilities; auditoriums; administrative facilities; Defense Finance Accounting and Accounting Service facilities; operation facilities; and security forces, armory, and canine facilities	232	85	197
Medical/Community Services/Community Commercial/Small-scale retail and service	Fitness center and running track, shoppette, food court, commissary, and Base Exchange	40	85	34
Lodging/Residential (Accompanied and Unaccompanied)	Dormitories	N/A	50	N/A
Outdoor Recreation/Open Space/Training Space	Parks, playgrounds, sport courts, park areas, and a gunfighter drop zone training area	N/A	25	N/A
Transportation	New paved roads and expansion of security gates and entry areas	45	80	36

Functional Category	***Example Projects***	***Estimated Total Area (Acres)***	***Percent Impervious Surface Coverage***	***Estimated Impervious Surface Coverage (Acres)***
Utilities/Infrastructure	Utility corridors for electricity, water, natural gas, communications, and sewer/wastewater; expansion of stormwater drainage canal; water tank; stormwater retention pond; de-arsenic plant; water purification plant; liquid oxygen plant; pumpstations; and utility pads	221	20	44
Existing Pavements	Improvements/maintenance of existing aprons, taxiways, ramps, roads, parking lots, and stormwater drainage canal; and installing structures on existing paved surfaces such as aircraft noise abatement, aircraft covered and parking areas	82	100	82
	Total	**1,486**	**82**	**1,216**

Note: Numbers may not add up due to rounding. N/A = not applicable

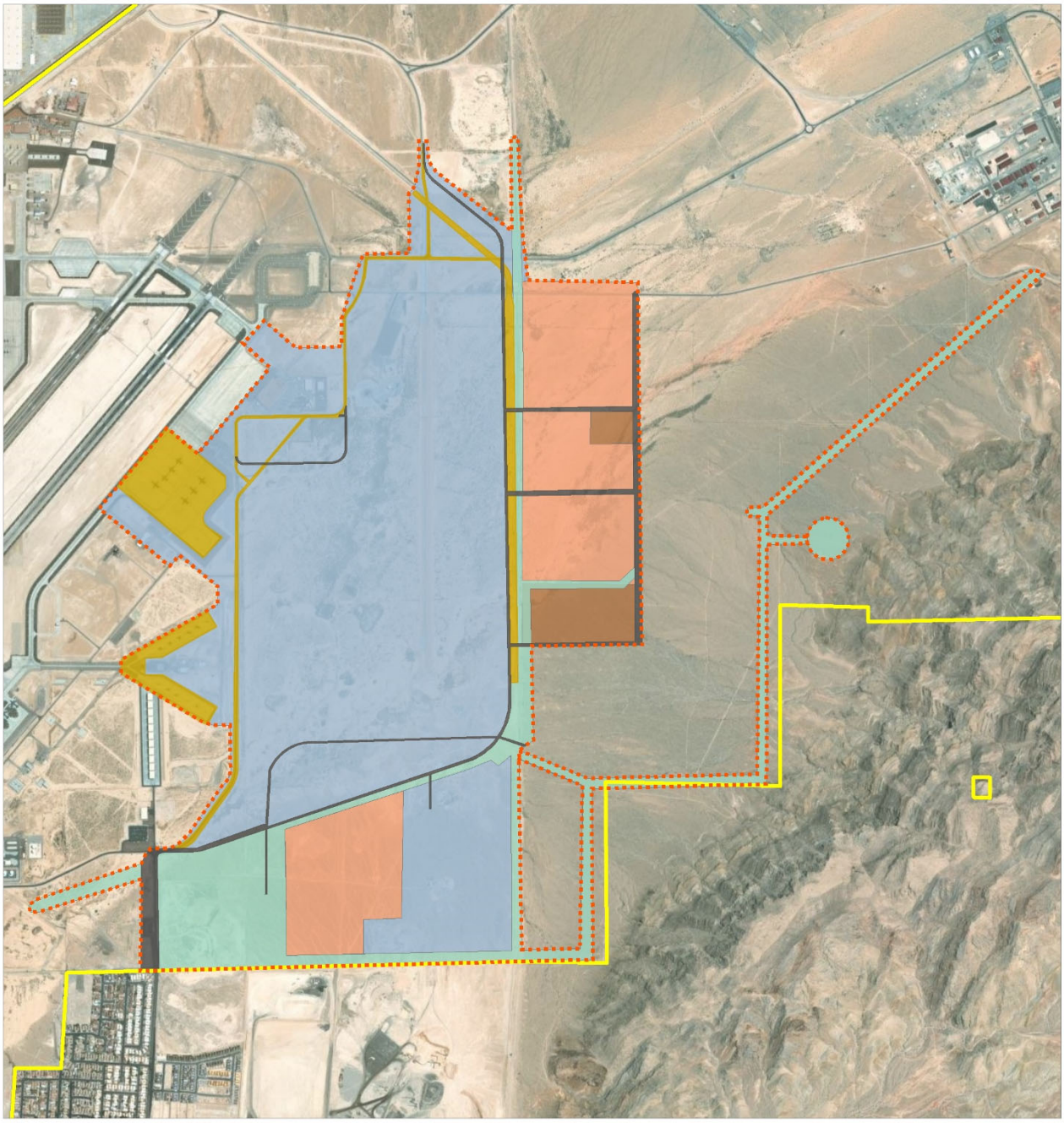


FIGURE 3.1-4
Alternative 2 - Partial Build-out Project Area with Functional Categories

- Alternative 2
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Medical/Community Services/Community Commercial/Small-scale Retail
- Transportation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

3.2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB would be insufficient to meet Air Force and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

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4.0 EXISTING UTILITY SYSTEMS OF THE EAST-SIDE DEVELOPMENT AREA

In order to determine the capability of the existing infrastructure to meet the demands of the proposed east-side development area, it is necessary to have a good understanding of the different infrastructure components. This section describes the components of each of the systems evaluated in this study and lists current utility loads and demands. This section provides a discussion on the existing location, capacity, condition, age, and any deficiencies of each utility system for the proposed east-side development area of Nellis AFB. The existing infrastructure supporting the greater Nellis AFB area is discussed only as it relates to or supports the east-side development area.

4.1 POTABLE WATER SYSTEM

4.1.1 EXISTING INFRASTRUCTURE

The proposed east-side development area currently has no existing potable water infrastructure, with the exception of potable water main lines that run along the west and north sides, as shown in **Figure 4.1-1**. Area II, which is northeast of the flight line, is served by water from the Main Base (Area I) and the northern water main lines, composed of 10-inch asbestos cement, are the closest existing water main line connections to the east-side development area. The western lines are associated with the North Las Vegas Water District (NLVWD) supply connection and consist of 10-inch plastic lines (AECOM, 2015).

The potable water system at Nellis AFB provides water for domestic, irrigation, and fire protection uses. The system provides potable water to the entire installation, excluding military family housing, which has been privatized since 2008. The existing potable water infrastructure at Nellis AFB contains primarily 10-, 12-, and 14-inch water main lines consisting of cast iron, copper, asbestos cement, and HDPE or PVC plastic totaling approximately 337,750 linear feet of pipe.

4.1.1.1 Water Supply Intakes

As shown in **Figure 4.1-1**, there are three existing water supply intakes on Nellis AFB: one Southern Nevada Water Authority (SNWA) intake and two NLVWD intakes, as described in further detail below. SNWA provides water to NLVWD and Nellis AFB, and all SNWA's raw water for this area is supplied from Lake Mead in Nevada (Nellis AFB, 2020a).

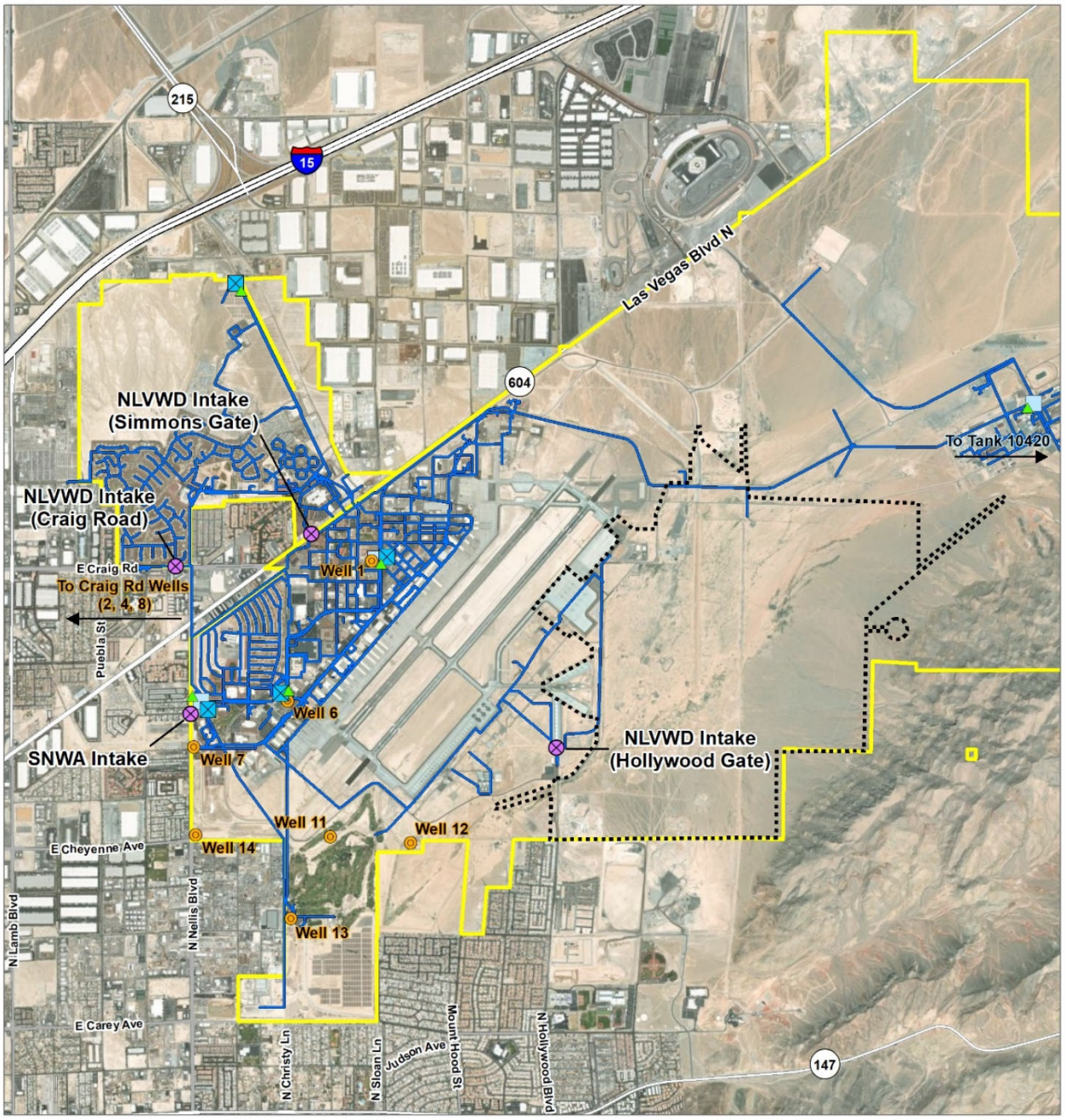


FIGURE 4.1-1
Nellis AFB Existing Potable Water Utilities

Elevated Storage Tank
Ground Storage Tank
Pump Station
Supply Connection
Well
Potable Water Main Line
Interstate Highway
State Highway
Major Road
Area of Potential Eastside Development
Installation Boundary

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

4.1.1.1.1 SNWA Intake

The SNWA intake is located on North Nellis Boulevard and serves as the primary water supply for Nellis AFB. Nellis AFB is permitted for up to 4,000 acre-feet per year (1,303 million gallons) and is permitted to provide up to 2 MGD to Nellis AFB (Nellis AFB, 2023b).

4.1.1.1.2 NLVWD Intakes

Hollywood Gate: The Hollywood Gate NLVWD intake is primarily reserved as an emergency connection for Nellis AFB and consists of a plastic, 10-inch line that was installed in the 1980s (AECOM, 2015).

Simons Gate: The second NLVWD intake is located near the water tower adjacent to Simons Gate along the intersection of Las Vegas Boulevard and Mike O'Callaghan Medical Center. This connection is utilized as a backup service for the Medical Center. The Medical Center is primarily served by the SNWA intake.

4.1.1.2 Groundwater Wells

The Installation-owned groundwater supply is a co-primary water source for the Nellis AFB population and is withdrawn from the Las Vegas Valley Aquifer. As shown in **Figure 4.1-1** and **Table 4.1-1,** Nellis AFB owns and operates 10 wells located on and off the Installation, of which two (Wells 2 and 8) are utilized to supplement additional water demands (Nellis AFB, 2020a,b). It is likely that most of the wells have a high arsenic concentration that makes them unfit for potable water use, including Wells 1, 6, 7, 11, 12, 13, and 14. Well 12 is used to supplement greywater and wastewater effluent irrigation at the Sunrise Vista Golf Course (Nellis AFB, 2020b). Currently, the Golf Course is primarily irrigated using reclaimed water from the City of North Las Vegas Wastewater Treatment plant. There are no groundwater wells located within the proposed east-side development area.

Table 4-1.1 Groundwater Wells at Nellis Air Force Base

Well Number	***Well Location***	***Operational Status***	***Production Issues***
1	Ellsworth Avenue/Swaab Boulevard	Not working	Unknown/High arsenic levels
2	Craig Road	Working/Potable - currently used to supplement potable water	None
4	Craig Road	Not working	Unknown
6	Tyndall Avenue/Duffer Drive	Not working	Unknown/High arsenic levels
7	Near I Street Gate	Not working/Potable	Dry/High arsenic levels
8	Craig Road	Working/Potable - currently used to supplement potable water	None

11	Perimeter Road	Not working - produced groundwater to supplement potable water prior to 2017	Collapsed/High arsenic levels
12	Next to Building 1602	Currently supplies greywater irrigation to the Sunrise Vista Golf Course	High arsenic levels
13	South of Main Base	Not working - produced greywater irrigation for the Sunrise Vista Golf Course prior to 2007 - Well 13 currently has no permitted water rights and would not be considered for future water supply	High arsenic levels
14	Southwest corner of Main Base	Not working -produced greywater irrigation for the Sunrise Vista Golf Course prior to 2014	High arsenic levels

Source: Nellis AFB, 2020b.

4.1.1.3 Water Storage

Nellis AFB currently maintains a potable water storage capacity of approximately 7.2 million gallons. As shown in **Figure 4.1-1** and in **Table 4.1-2**, five tanks are located on the Main Base (Area I) that collectively store 3.8 million gallons; one tank is located within Area III that stores 3.0 million gallons, and two tanks are located within Area II that store 0.4 million gallons. Each tank is collocated with a pump station (AECOM, 2015). There is currently no potable water storage for the east-side development area.

Table 4-1.2 Water Tanks at Nellis Air Force Base

Area	*Tank No.*	*Location*	*Type*	*Capacity (Million Gallons)*
Main Base (Area I)	491	Well 6, Near Nellis Terrace Housing	Ground	0.5
	561	West of Ellsworth Avenue, At Well 1	Ground	0.2
	562	West of Ellsworth Avenue, At Well 1	Elevated	0.5
	1725	South of Nellis Terrace, near Golf Course	Ground	2.3
	1721	South of Nellis Terrace, near Golf Course	Elevated	0.3
Area II	10420	Weapons Storage Area	Elevated	0.1
	10113	Near Red Horse	Ground	0.3
Area III	1999	North of Caffarelli Court, Near Range Road	Ground	3.0
			Total	**7.2**

Source: AECOM, 2015.

4.1.1.4 Fire Protection

Nellis AFB has approximately 7.2 million gallons of potable water storage that is also used for fire protection storage, with three elevated storage tanks and five ground-based storage tanks (AECOM, 2015). Base personnel have not indicated any existing fire protection deficiencies (Nellis AFB, 2023b). Supply is adequate and the distribution network is in adequate condition (Nellis AFB, 2020a).

4.1.2 EXISTING WATER SUPPLY AND DEMAND

The existing Nellis AFB available potable water supply from SNWA is 7.8 MGD with an average daily usage of 1.1 MGD for Fiscal Year (FY) 2021 and 0.9 MGD for FY 2022 (Nellis AFB, 2023c).

Potable water supply for Nellis AFB is primarily supplied from Lake Mead which is fed by SNWA-contracted water from the Colorado River. From Lake Mead, water is transmitted to Nellis AFB via two water treatment plants (Alfred Merritt Smith Water Treatment Facility or the River Mountains Water Treatment Facility) followed by a series of large diameter pipelines, regulating tanks, reservoirs, and surge towers. Per correspondence with Nellis AFB personnel, FY 2023 groundwater use from Wells 2 and 8 on Craig Road accounted for 11.5 percent of Nellis AFB potable water usage and NLVWD accounted for less than 1percent of potable water use.

The existing available groundwater yield is estimated at 0.6 MGD (Nellis AFB, 2020b). In CY 2023, Wells 2 and 8 produced 96 acre-feet (31,136 thousand gallons, 0.09 MGD) of water for Nellis AFB (Nellis AFB, 2020b).

4.1.3 EXISTING POTABLE WATER SYSTEM DEFICIENCIES

4.1.3.1 Infrastructure

Most of Nellis AFB's original water distribution system was constructed in the 1950s. Largely, the water distribution system has only been upgraded when necessitated by breaks or other repair requirements. The Main Base (Area I) distribution network is generally adequate to meet existing supply needs; however, the condition of the distribution network is poor. Due to the age, pipe material, and sedimentary build-up, the distribution network prevents continued development and is not sufficient to meet current nor short term mission growth (Nellis AFB, 2020a).

The Munitions Storage Area and Area II infrastructure is in especially poor condition with sections of pipe that are oversized and un-looped, creating unsafe potable water conditions; these lines are routinely flushed to maintain an appropriate flow for water potability and pressure for fire suppression. Mitigations such as these have incurred unnecessary water waste and cost (Nellis AFB, 2020a). The potable water distribution system is currently rated as unsatisfactory, considered to be in poor condition, and at maximum capacity without ability to accommodate future development or mission expansion (Nellis AFB, 2020b).

4.1.3.2 Water System Pressure

Based on model simulations, water system pressures are below the Unified Facilities Criteria (UFC) minimum requirement of 40 pounds per square inch (psi) during normal operation for the northern portion of Area I and some portions of Area II. Model simulations predict water system

pressures are above the maximum UFC recommendation of 100 psi during normal operation in significant portions of Area II. Low and high pressures are the result of significant elevation differences across the Installation (AECOM, 2015).

4.1.3.3 Potable Water Storage

The potable water storage tanks on the Installation have been minimally maintained and require clean out and restoration (Nellis AFB, 2020b). The storage facilities also suffer from chlorine degradation enhanced by higher temperatures due to the ambient temperature and solar radiation, which results in unsafe drinking water due to lack of disinfection (Garcia-Avila et al., 2020).

Operators do not currently fill the 3-million-gallon ground-based storage tank (Tank 1999) to capacity due to water quality concerns related to chlorine degradation. As a result, the Installation is deficient in storage to meet existing requirements (peak hour equalization, fire, and operational storage) for Area I. If Tank 1999 were filled completely, Area I would have adequate storage; however, the amount of water in the tank would not cycle enough to keep an acceptable chlorine residual (AECOM, 2105).

4.1.3.4 Fire Protection

The lack of sufficient water distribution limits the developable opportunities and existing mission expansions on the Installation, as new facilities would not meet current fire code. Without such investment, Nellis AFB is not postured to adequately support future mission growth. In addition, the fire and potable water lines are combined which contributes to low chlorine residuals. Water lines must frequently be flushed to improve water quality (Nellis AFB, 2020a).

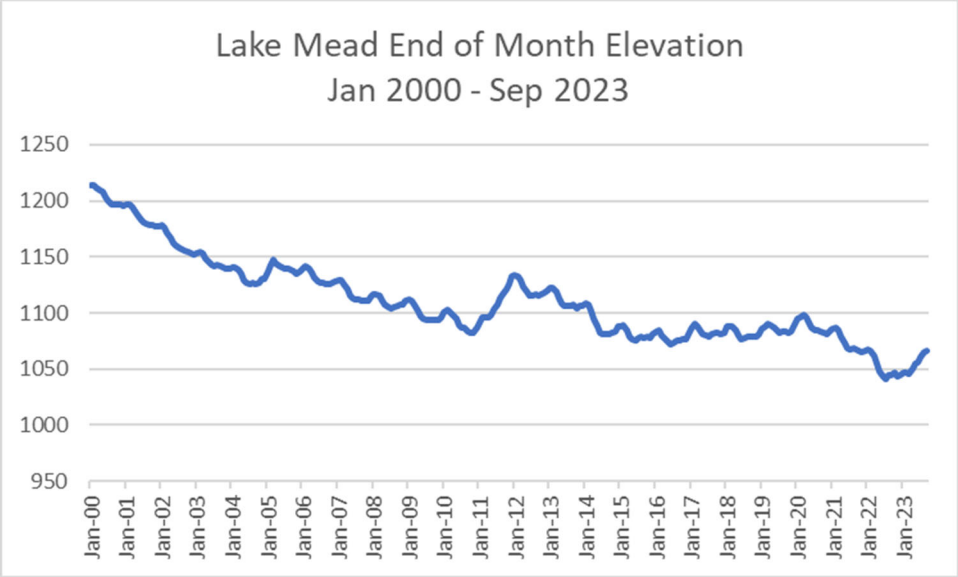
Based on model simulations, available fire flow is adequate to meet the non-sprinklered building fire flow requirements at approximately 81 percent of the fire hydrants while maintaining a residual pressure of 20 psi. Model simulations indicate the system is unable to meet the requirements of approximately 42 to 61 percent of sprinkler systems, depending on actual pressure and hose stream requirements of those systems (AECOM, 2015).

Field test and hydraulic model results suggest firefighting capacity in Area II is very limited due to system hydraulics and tank operation and volume (AECOM, 2015). In addition, tank volume deficits related to Tank 1999, as discussed in Section 4.1.3.3, results in reduced firefighting capacity in Area III. Currently, a project is underway to rebuild the pumphouse and modify the tank in Area III to improve firefighting capacity to Area III.

4.1.3.5 Water Supply

Based on meetings with SNWA, there are no current water supply concerns regarding potable water supply from Lake Mead (Nellis AFB, 2023b). Nellis AFB currently has adequate water supply for the current demand (Nellis AFB, 2023b).

Lake Mead is the primary source of the Las Vegas Valley's drinking water and the SNWA connection is the primary supply connection to Nellis AFB. Long-term concerns due to Lake Mead's capacity exist, as Lake Mead's water level has been at an all-time low due to record drought conditions, as shown in **Figure 4.1-2**. Models predict that the supply of water from Lake Mead to the Las Vegas area could be significantly limited (Nellis AFB, 2021). The combination of an ongoing drought, lower water level in Lake Mead due to smaller snowpack in the Colorado Rockies, and increased population in the Las Vegas Valley have contributed to Lake Mead dropping to a post-2000 minimum elevation of 1,040 feet in 2022 and triggering the first-ever shortage of water in the Colorado River (Bureau of Reclamation, 2023).



Source: Bureau of Reclamation, 2023.

Figure 4.1-2 Elevation Data for Lake Mead Water Quality

It is unknown whether the wells have sufficient stand-by power supply to be considered reliable during a power outage (AECOM, 2015).

4.1.3.6 Water Quality

Nellis AFB routinely experiences chlorine degradation at multiple sites throughout the Installation. During the period of April 22, 2014, through April 24, 2014, chlorine residuals were above state requirements of 0.05 milligrams per liter (mg/L) at 26 of 28 sites sampled. Modeling in 2015

predicted chlorine residuals were generally above 0.05 mg/L, except on long dead ends and areas with very little water demand (AECOM, 2015).

It is likely that most of the wells at Nellis AFB have a high arsenic concentration that makes them unfit for potable water use, including Wells 1, 6, 7, 11, 12, 13, and 14 (Nellis AFB, 2020b).

There are currently several PFAS-impacted sites, including both groundwater and shallow soil sites, within the boundary of the east-side development area with associated groundwater monitoring wells.

4.2 WASTEWATER SYSTEM

4.2.1 EXISTING INFRASTRUCTURE

As shown in **Figure 4.2-1**, the proposed east-side development area currently has no existing wastewater system infrastructure, with the exception of several existing wastewater lines along the western side of the proposed development area connected with the existing system. Wastewater infrastructure on the Installation is owned by Nellis AFB and off-site wastewater conveyance and treatment is provided by CCWRD. South of the Hollywood Gate, CCWRD maintains sanitary sewers and pump stations for the residential areas around the Installation.

4.2.2 EXISTING WASTEWATER LOAD

Presently, the Installation generates sewage at rates of approximately 1.2 MGD (average), and 1.6 MGD (peak) with no reported capacity concerns (Nellis AFB, 2020b). Wastewater is adequately serviced on the Main Base (Area I) by the existing vitrified clay pipe, concrete, and PVC sewage conveyance system originally constructed in the 1940s and 1950s (Nellis AFB, 2023a). The connection within Nellis Boulevard to the CCWRD wastewater conveyance system has capacity for 26 MGD (Nellis AFB, 2020b). No wastewater is presently generated on the east-side development area.

4.2.3 EXISTING WASTEWATER DEFICIENCIES

Nellis AFB wastewater lines are in need of replacement due to the age of the system, with the oldest lines currently over 90 years old (AECOM, 2015). Wastewater systems typically have a design life of approximately 50–100 years (American Water Works Association, 2014).

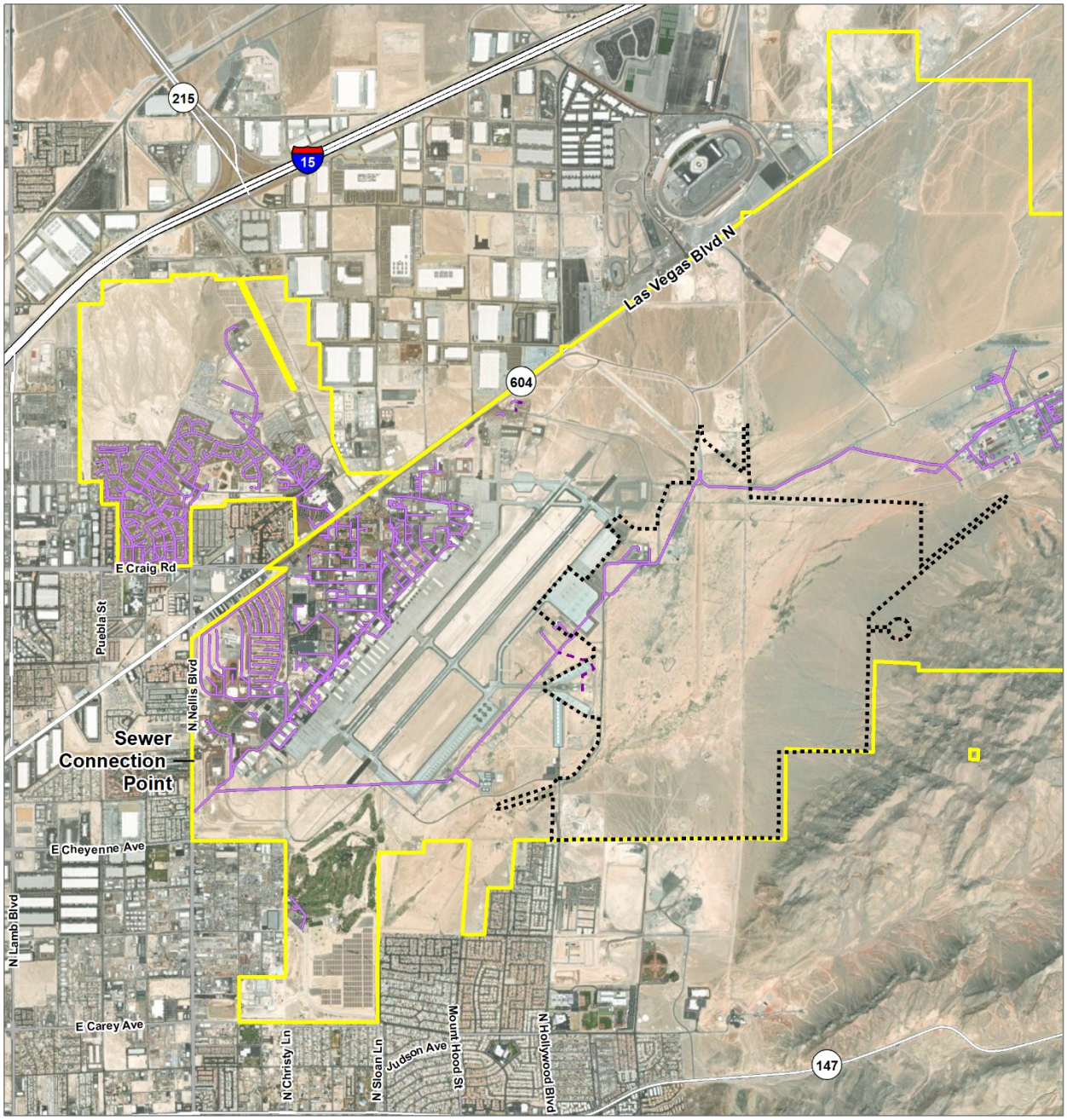


FIGURE 4.2-1
Nellis AFB Existing Wastewater Utilities

Wastewater Gravity Main Line
Wastewater Pressurized Main Line
Interstate Highway
State Highway
Major Road
Area of Potential Eastside Development
Installation Boundary

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

Nellis AFB personnel have not reported any deficiencies with the main connection to the Nellis Boulevard system and the utility, CCWRD, has reported sufficient capacity in both the sewerage system and plant for the proposed development (Nellis AFB, 2023a).

4.3 STORMWATER MANAGEMENT SYSTEM

4.3.1 EXISTING INFRASTRUCTURE

As shown in **Figure 4.3-1**, the proposed east-side development area currently has no existing stormwater system infrastructure, with the exception of a CCWRD-built stormwater flume that runs north to south. This flume is approximately 51-feet-wide by 10-feet-deep reinforced concrete channel that drains into a riprap apron prior to discharge offsite. As shown in **Figure 4.3-1**, a confluence basin located south of the Installation receives stormwater directed to it from the currently undeveloped areas. A proposed modification to the existing stormwater confluence basin is under consideration by Clark County Regional Flood Control District (CCRFCD), which is anticipated to begin design no sooner than 2028 (CCRFCD 2024).

Nellis AFB lies within the Range Wash Watershed; the branches of the Range Wash enter Nellis AFB and flow from north to south through Nellis AFB, east of the runways, and ultimately discharge into the confluence detention basin. Storm drainage at Nellis AFB is predominantly surface channels with limited underground infrastructure, including open drainage lines, culvert lines, gravity lines, discharges areas, and stormwater storage reservoirs. The system consists of a combination of corrugated metal pipes, culverts, natural swales, and concrete troughs. These conveyances move the stormwater runoff toward the southeast to ground absorption areas or drainage channels (Nellis AFB, 2018b). The Main Base (Area I) contains stormwater channels and culverts which are directed to a large flume on the southwest side of the Installation that directs flows offsite ultimately to the Las Vegas Wash (Nellis AFB, 2020b). The existing landscape is mostly homogeneous desert landscape.

Flows in the Range Wash are ephemeral, occurring only during rainfall events; storms can bring up to 1 inch an hour. Flood flows are generally unconfined and widespread following the natural terrain through Nellis AFB toward the confluence detention basin. Currently, flood flows from the Range Wash overtop Las Vegas Boulevard, Ellsworth Avenue, and Munitions Road. The Hollywood Branch combines with the East Tributary to form a wide natural wash that crosses Nellis AFB south of Munitions Road (Nellis AFB, 2018b).

Nellis AFB, including the east-side development area, operates under the National Pollution Discharge Elimination System Municipal Separate Storm Sewer System Permit NV-0021911, which has been issued for the entire Las Vegas Valley, the city of Las Vegas, and Clark County.

1

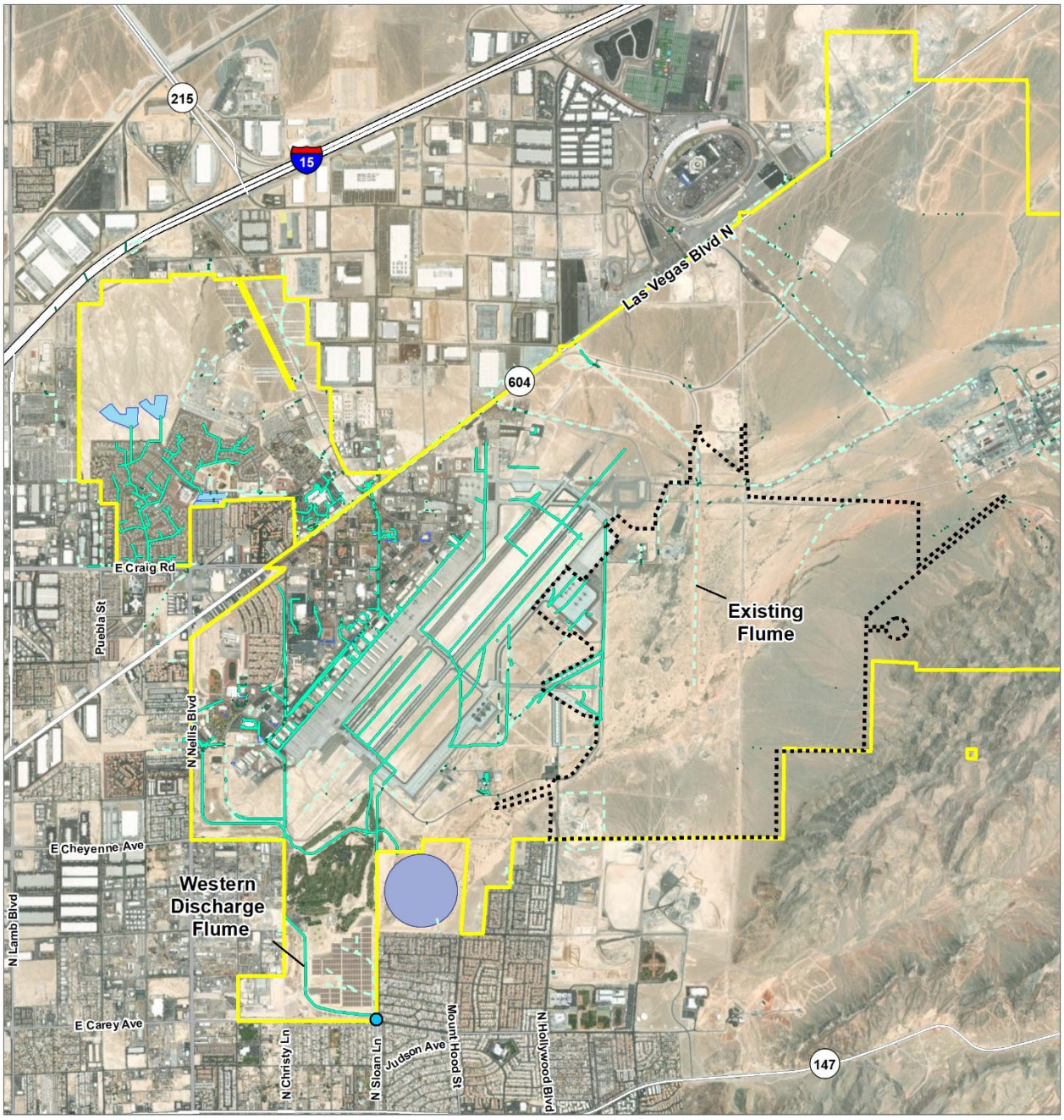
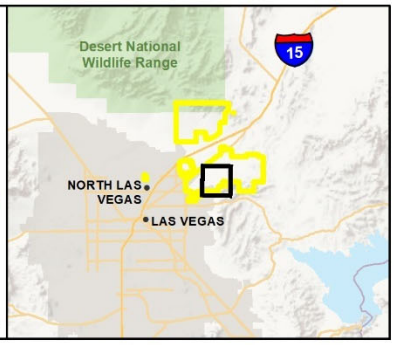


FIGURE 4.3-1
Nellis AFB Existing Stormwater Utilities

Stormwater Discharge Point
Stormwater Culvert
Stormwater Gravity Line
Stormwater Open Drainage Line
Stormwater Confluence Basin
Stormwater Storage Reservoir
Interstate Highway
State Highway
Major Road
Area of Potential Eastside Development
Installation Boundary

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



4.3.2 EXISTING STORMWATER SYSTEM DEFICIENCIES

Existing stormwater management capacity is adequate for the Installation; however, the existing stormwater management conveyance network of pipes and drainage swales is in poor condition and in need of rehabilitation (Nellis AFB, 2020a).

During storm events, Nellis AFB personnel have reported that flooding of the flight line is common (Nellis AFB, 2023d). Other areas of the Installation, including roadways, flood during larger rainfall events (Nellis AFB, 2023d). Of concern is approximately 3,600 acres which drain, uncontrolled, from Sunrise Mountain. During large storm events, the flight line and surrounding areas experience standing water, which prevents operations at the Installation from proceeding. Currently, overflows prevent safe passage for vehicles to cross the Hollywood Branch at Las Vegas Boulevard, Ellsworth Avenue, and Munitions Road, and decreased flood security for the Nellis AFB occupants, runways, and associated infrastructure (Nellis, 2018b).

4.4 ELECTRICAL SYSTEM

4.4.1 EXISTING INFRASTRUCTURE

As shown in **Figure 4.4-1**, the proposed east-side development area currently has no existing electrical system infrastructure, with the exception of several primary overhead and underground electrical lines. These lines are located along the western and northern edges of the proposed development that connect and currently service the Main Base (Area I) and Area II.

The principal electrical utility service provided to Nellis AFB is from NV Energy (NVE) via a 69 kV sub-transmission feeder to the Nellis AFB-owned Northgate distribution substation. The Northgate substation is located within the Installation at the corner of Las Vegas Boulevard North and Beale Avenue.

The Northgate substation has two three-phase transformers, one 40 MVA transformer, and one 33 MVA transformer, each of which steps the voltage down from 69 kV to 12.47 kV. A double ended medium voltage switchgear lineup distributes the 12.47 kV throughout the Installation via nine primary overhead and underground circuits. Other than circuit #6, all existing circuits have some interconnections with other circuits to allow partial redundancy in the distribution system (Hughes Associates, 2014).

In 2007, a privately owned 15 MVA utility scale solar photovoltaic (PV) array, Nellis Solar Array (NSA) I, was installed on leased property in the northwest corner of the Installation. This array is owned and managed by Solar Star NAFB, LLC and Brookfield Renewable Partners. The NSA I equipment is tied directly into electrical distribution circuits #5 and #6. NSA I is independently metered and Solar Star NAFB bills Nellis monthly for the consumed kilowatt hours (KWH).

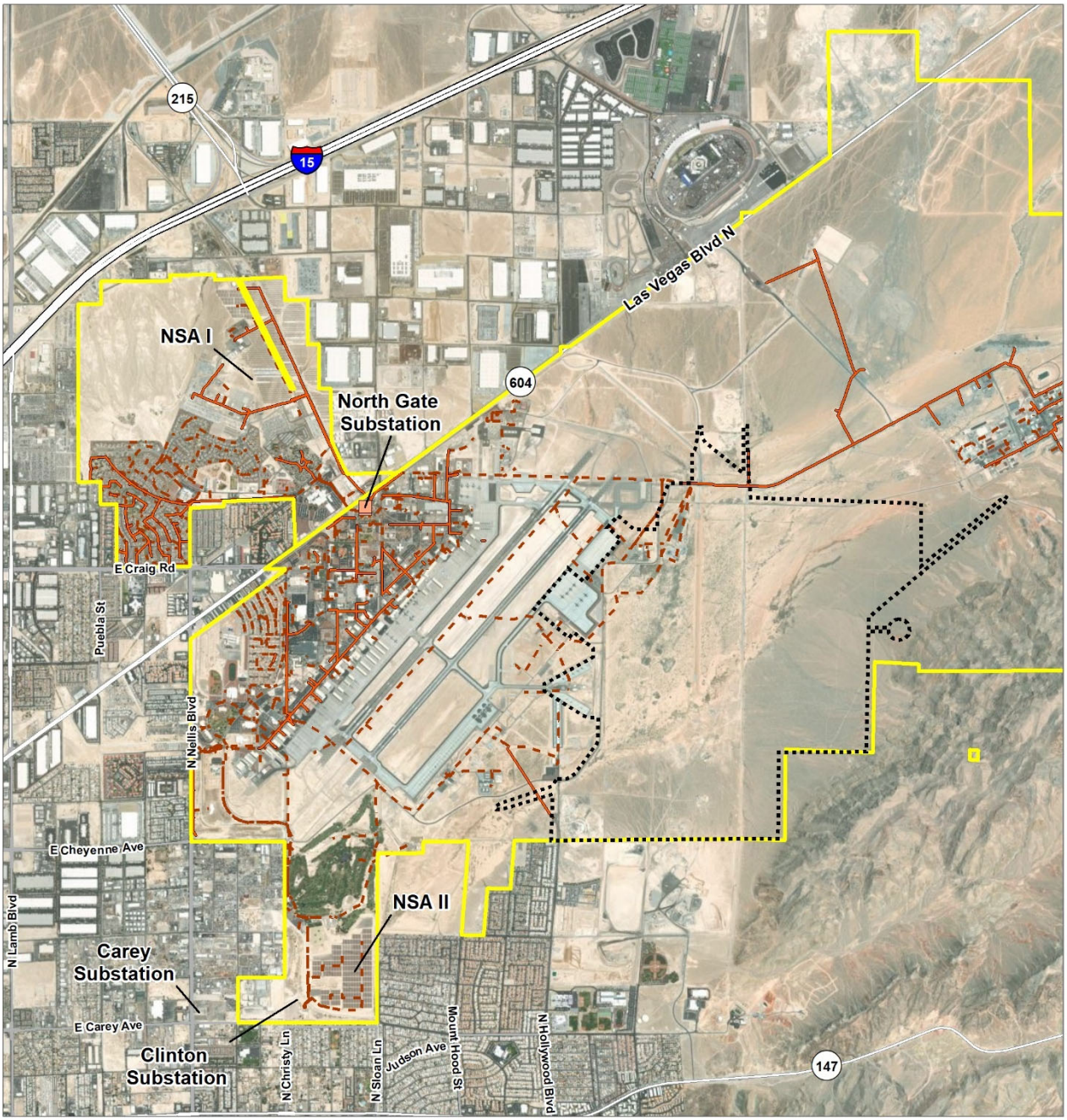
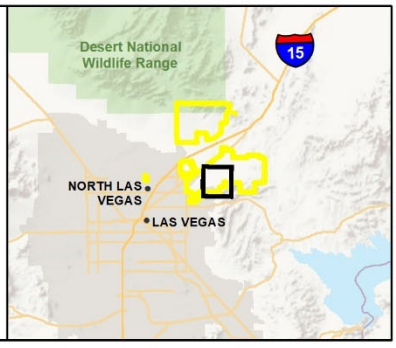


FIGURE 4.4-1
Nellis AFB Existing Electrical Utilities

Existing Substation
Primary Overhead Electrical Line
Primary Underground Electrical Line
Interstate Highway
State Highway
Major Road
Area of Potential Eastside Development
Installation Boundary

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



The system is currently 17 years old, and per the FY 2022 *Annual Energy Management & Resilience Report,* the electrical output has been down sharply since 2020. The current lease expires in 2027 (Nellis AFB, 2022a).

In 2015, NVE was granted a property lease at the south end of the Installation, between the golf course and East Carey Avenue, to install a second 15 MVA solar array, NSA II, and tie it into distribution circuits #1, #2, and #9. As a part of the agreement, NVE also installed the new 22 MVA Clinton 12.47 kV distribution substation near East Carey Avenue (Sahagun, 2015). The Clinton distribution substation includes two 11 MVA feeders that are interconnected to Installation distribution circuits #1 and #2. Both NSA II and the Clinton substation are owned and operated by NVE. Additionally, NVE has extended a third 11 MVA feeder on the south end of the Installation from their off-Installation Carey Avenue substation, switched via the Clinton substation, as a backup interconnection for Nellis AFB circuit #9. These backup circuits provide resiliency to the electrical distribution system and can provide power to the Installation when the Northgate distribution substation is disabled or requires maintenance (Nellis AFB, 2020a). Demand and consumption charges for power supplied by NSA II are billed similarly to all other power supplied by NVE (Nellis AFB, 2022a). The onsite generation of renewable energy from NSA I and II enables Nellis AFB to meet all its daytime summertime peak power requirements from the PV arrays alone, with only reactive power being imported from off the Installation while the PV arrays are operating (Nellis AFB, 2020a).

4.4.2 Existing Electrical Load

Nellis AFB electrical energy demand and consumption varies seasonally and yearly primarily dependent upon climatic conditions with the peaks attributed to the cooling requirements of the warmer months. From June 2022 through September 2023, the NVE maximum monthly consumption was 12,258,634 KWH in July 2023, and the maximum monthly KWH generation from the NVE NSA II PV array was 4,295,348 KWH in June 2022. The NVE metered peak monthly demand was 23.1 MVA in July 2023. NVE combines the offsite generated and onsite NSA II PV array generated demand into one consolidated invoice. The maximum monthly KWH generation from the Solar Star NSA I PV array was 2,245,428 KWH in August 2023. Currently, the Northgate substation has a peak demand spare capacity of about 12 MVA to support mission growth (Nellis AFB, 2023e). Overall, the Solar Star NSA I PV array produces the power required for 16 percent of the Installation-wide consumed KWH and the NVE NSA II PV array produces the power required for 26 percent of the Installation wide consumed KWH resulting in the combined power produced from both arrays accounting for approximately 42 percent of the Installation-wide consumed KWH. **Table 4.4-1** lists the NVE maximum electrical demand and consumption, and the Solar Star generated electricity by month from June 2022 through September 2023.

Table 4-4.1 Nellis AFB Monthly Electrical Demand and Consumption

Month	*NV Energy Peak Demand (KW)*	*NV Energy Utility Generation (KWH)*	*NSA I Array Generation (KWH)*	*NSA II Array Generation (KWH)*	*Nellis AFB Total Consumption (KWH)*	*NSA I & II Generation % of Total (KWH)*
JUN 2022	20,295	5,822,177	1,990,421	4,295,348	12,107,946	52%
JUL 2022	22,463	7,851,405	1,828,748	3,897,078	13,577,231	42%
AUG 2022	21,014	8,299,217	1,676,140	3,393,544	13,368,901	38%
SEP 2022	21,044	6,678,222	1,772,442	3,370,786	11,821,450	44%
OCT 2022	17,833	6,045.440	1,701,277	2,284,268	10,030,985	40%
NOV 2022	13,443	5,619,931	1,203,711	1,410.844	8,234,486	32%
DEC 2022	13,119	6,142,501	981,724	1,367,843	8,492,068	28%
JAN 2023	13,666	6,460,871	1,015,632	1,295,517	8,772,020	26%
FEB 2023	13,885	5,286,084	1,253,089	1,509,789	8,048,962	34%
MAR 2023	22,463	5,476,244	1,417,213	1,703.000	8,623,457	36%
APR 2023	22,632	3,937,444	2,036,506	2,796,843	8,770,793	55%
MAY 2023	18,432	5,454,732	2,117,883	3,302,715	10,875,330	50%
JUNE 2023	18,704	5,744,357	2,057,843	3,438.787	11,240,987	49%
JULY 2023	23,113	8,059,735	2,010,881	4,198,899	14,269,515	44%
AUG 2023	20,456	7,685,426	2,245,428	3,291,410	13,222,264	42%
SEP 2023	18,185	5,834,167	2,072,904	2,956,749	10,863,820	46%
Totals	**300,747**	**100,397,953**	**27,381,842**	**44,540,419**	**172,320,214**	**42%**

Legend: % = percent; KW= Kilowatts; KWH= Kilowatt Hours; NSA= Nellis Solar Array.
Source: NVE and Solor Star Electric, 2023.

4.4.3 EXISTING ELECTRICAL SYSTEM DEFICIENCIES

Overall, the electrical distribution system is considered in fair condition. For the east side of the airfield only two current circuits are available. These are circuit 4 along the north, east and southeast side of the airfield with backup from circuit 1 along the south side of the airfield. Both circuits require upgrading to a minimum of 900-amps.

The only project currently under construction is the upgrade of circuit 1, on the south side of the airfield from Tyndall Avenue east to the corner of Perimeter Road, from a 300-amp rated circuit to a 600-amp rated circuit. There are three projects in the design phase to upgrade most of circuit 4. The cables on the north and west portion of circuit 4 are only rated at 300-amp (6,5MVA) capacity and are 60 years old and beyond their life expectancy. The circuit 4 cables on the east side are rated at 300-amp and the circuit 4 cables on the southeast side are rated at 155-amp. Both sections of circuit 4 cables are undersized to support future load requirements and make them poor candidates for a crosstie to bring backup power from circuit 1. Long term the Installation has plans for upgrading the Area I portions of circuits 1, 2, 3, and 5 and Area III portions of circuits 5 and 6. The Installation is also considering upgrading parts of circuit 4 in Area II.

Circuit 4 has minimum capacity for small upgrades, renovations, and small capital improvements adjacent to perimeter road. Upgrading the circuit 4 and circuit 1 medium voltage breakers in the Northgate substation to 900-amp and completion of the potential cable upgrades to circuit 4 would

provide a spare capacity on circuit 4 of 7.5 MVA allowing for some larger projects to be completed. However, full expansion of the flight line east side airfield apron, new hangars, and operational spaces would require a new substation and underground distribution infrastructure system (Nellis AFB, 2020a).

4.5 TELECOMMUNICATIONS SYSTEM

4.5.1 EXISTING INFRASTRUCTURE

As shown in **Figure 4.5-1**, the proposed east-side development area currently has no existing telecommunications system infrastructure, with the exception of several communication cable lines to the west and north. These lines are located along the western and northern edges of the proposed development area that connect and currently service the Main Base (Area I) and Area II.

According to the 99 ABW Plans and Projects Engineer, the communications infrastructure is comprised of an underground fiber optic network system. All existing copper infrastructure systems have been removed or have been abandoned (Nellis AFB, 2023f; See **Appendix A** for meeting minutes). The data/communications utility provider is Lumen Technologies. Their fiber optic networks are brought into the Installation through an underground duct bank system to three Minimum Point of Presence network interface locations (Buildings 6, 200, and 1740). The network backbone is then distributed to Information Transfer Buildings (ITBs) throughout the Installation that act as Outside Plant (OSP) fiber optic cable concentration points from individual facilities. Command and control mission facilities have redundant OSP connections to at least two ITBs, all other facilities have OSP connectivity to at least one ITB (Nellis AFB, 2023g). The Installation owns and maintains the OSP.

A new ITB, Building 2892, located on the east side of the flight line near the existing tower, is currently under construction. This ITB could support future build-out of the airfield apron, hangars, and operational spaces on the proposed east-side development area at the north end of the flight line.

As shown in **Figure 4.5-2**, the Installation is currently working with Verizon on projects to install three LTE enhanced cell service towers. Two of these would be located on the Main Base (Area I) and the third would be installed in Area II (Verizon, 2023).

4.5.2 EXISTING COMMUNICATIONS SYSTEM DEFICIENCIES

Communications infrastructure has reached saturation with limited capacity remaining in select locations on the Installation. Nellis AFB has a critical shortage of floor space available for communications equipment in certain communications hubs. The availability of floor space is a

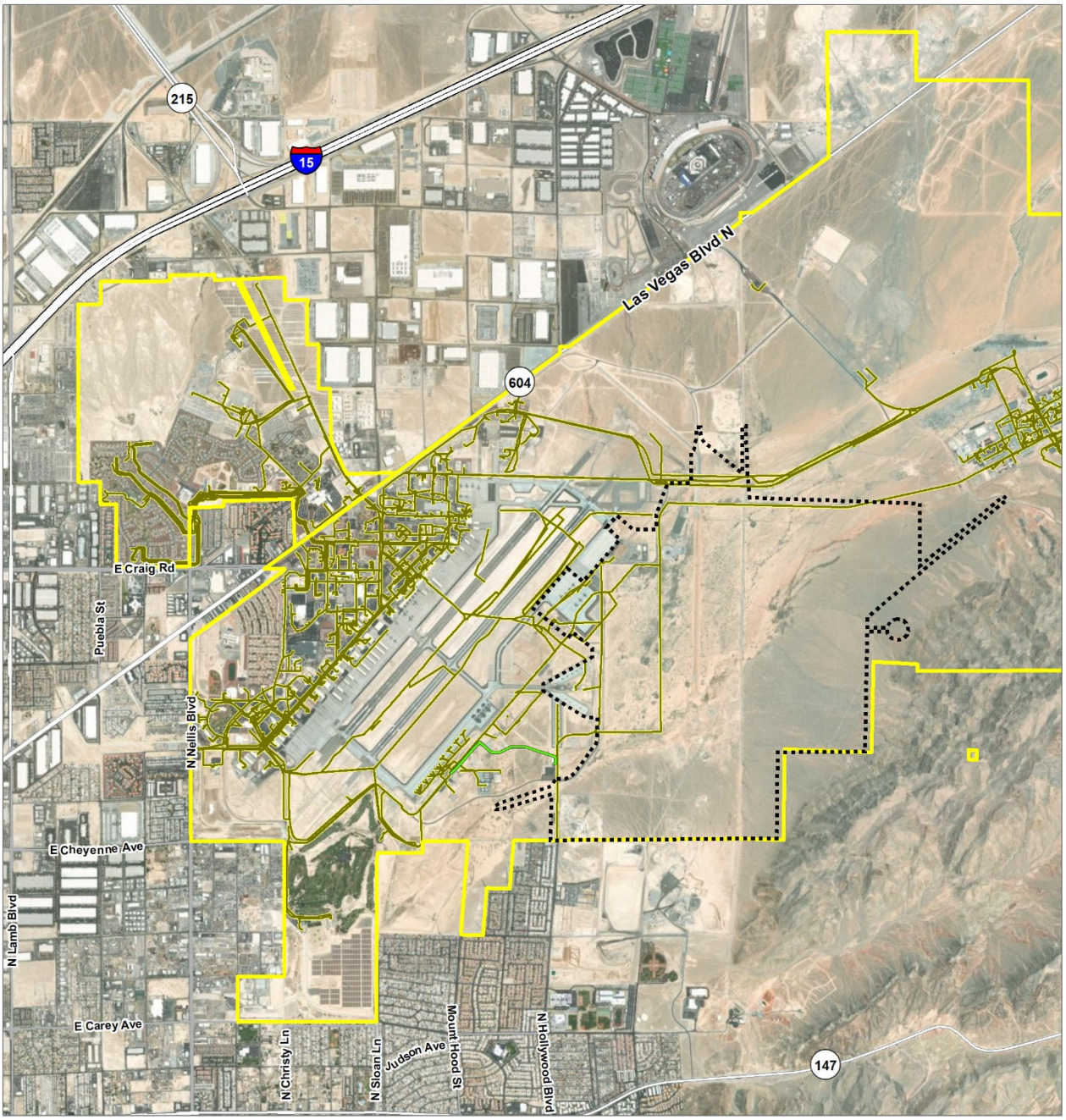
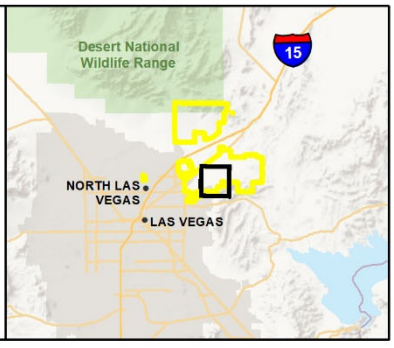


FIGURE 4.5-1
Nellis AFB Existing Communication Utilities

Communication Cable Line
Communication Duct Line
Interstate Highway
State Highway
Major Road
Area of Potential Eastside Development
Installation Boundary

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



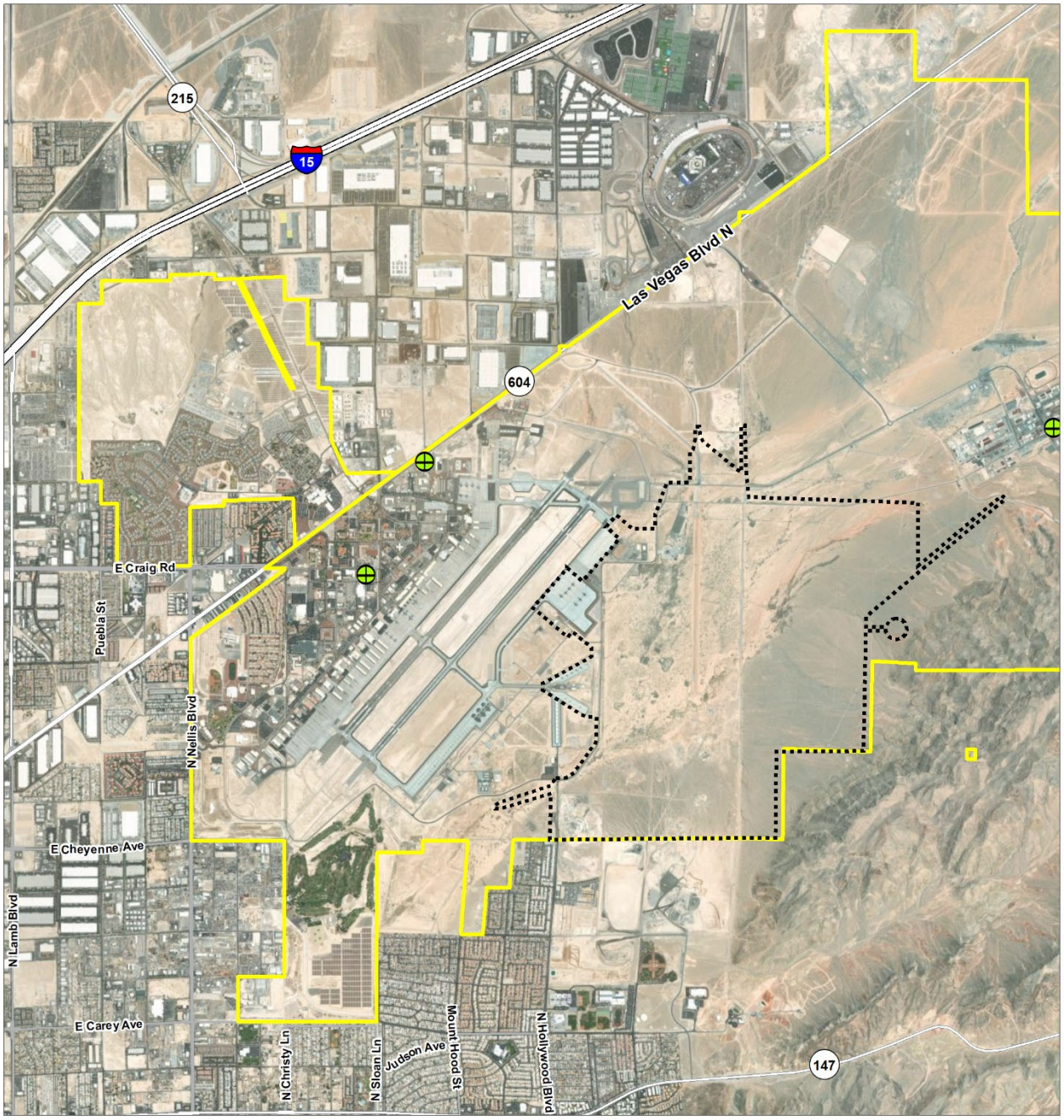
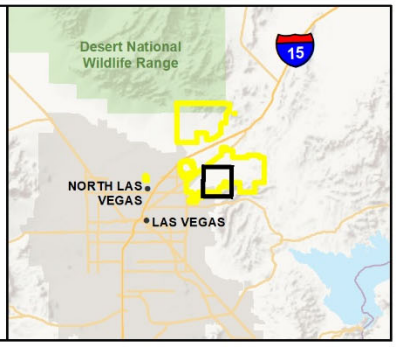


FIGURE 4.5-2
Nellis AFB Outside Agency - Proposed Cell Towers

Proposed Cell Tower
Area of Potential Eastside Development
Interstate Highway
Installation Boundary
State Highway
Major Road

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



constraint to the new and growing mission requirements. Underground duct congestion is further constraining the capacity of Nellis AFB's communications infrastructure. As the ducts become saturated, no new communications lines/fiber can be run, limiting the ability for Nellis AFB to be able to accommodate additional growth/demand in select areas of the Installation.

4.6 NATURAL GAS SYSTEM

4.6.1 EXISTING INFRASTRUCTURE

As shown in **Figure 4.6-1**, the proposed east-side development area currently has no existing natural gas system infrastructure, with the exception of one natural gas distribution line that runs through the center of the development area, owned by Southwest Gas. This line currently services Area II; the Area II natural gas system is not connected to the Main Base (Area I).

Nellis AFB is serviced by natural gas from Southwest Gas via an 8-inch buried coated supply line under Nellis Boulevard; a single meter is utilized for gas billing. System pressure is maintained at 35 psi. Natural gas is supplied to the Main Base (Area I) along Las Vegas Boulevard North and to Areas II and III along Hollywood Boulevard and Craig Road. Twenty buildings east of the flight line are presently heated with electricity, as there is currently no available gas connection.

4.6.2 EXISTING NATURAL GAS LOAD

Natural gas demand was approximately 174,000 cubic feet per day in FY 2023 with an available supply of over 21 million cubic feet per day (Nellis AFB, 2020a). The supply of natural gas is adequate for present needs (Nellis AFB, 2020a).

4.6.3 EXISTING NATURAL GAS SYSTEM DEFICIENCIES

The existing natural gas needs at Nellis AFB are met by current infrastructure. The distribution network is in good condition and should continue to serve the existing site adequately with regular maintenance (Nellis AFB, 2020a).

4.7 HYDRANT FUEL SYSTEM

4.7.1 EXISTING INFRASTRUCTURE

As shown in **Figure 4.7-1**, the proposed east-side development area currently has no existing hydrant fuel infrastructure, with the exception of aviation fuel distribution pipelines along the western edge that connect to the existing system.

1

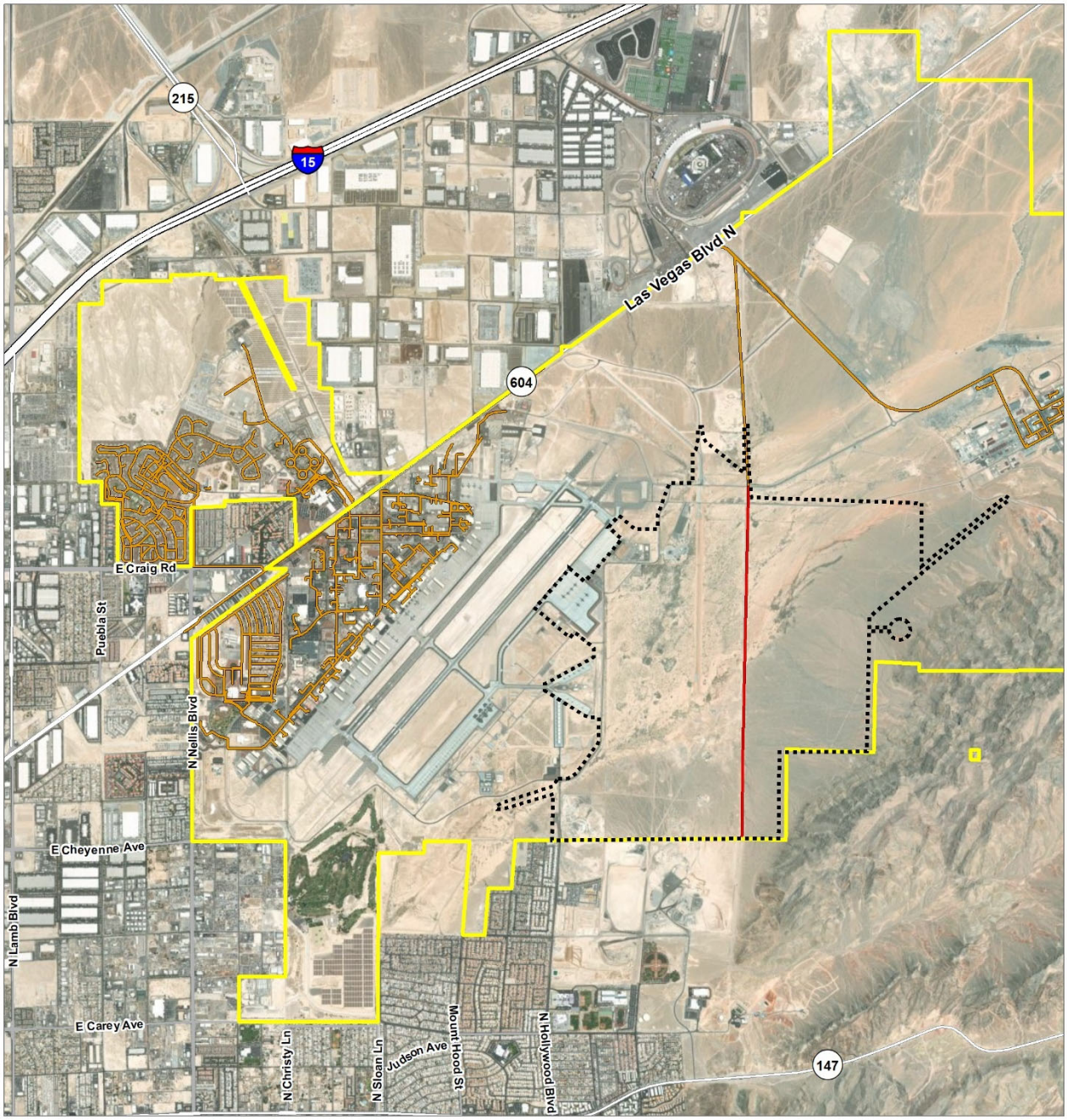
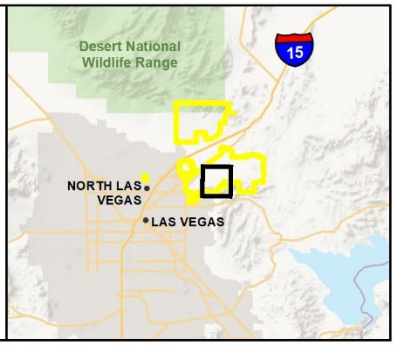


FIGURE 4.6-1
Nellis AFB Existing Natural Gas Utilities

Natural Gas Distribution Line
Southwest Gas Owned Natural Gas Line
Interstate Highway
State Highway
Major Road
Area of Potential Eastside Development
Installation Boundary

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



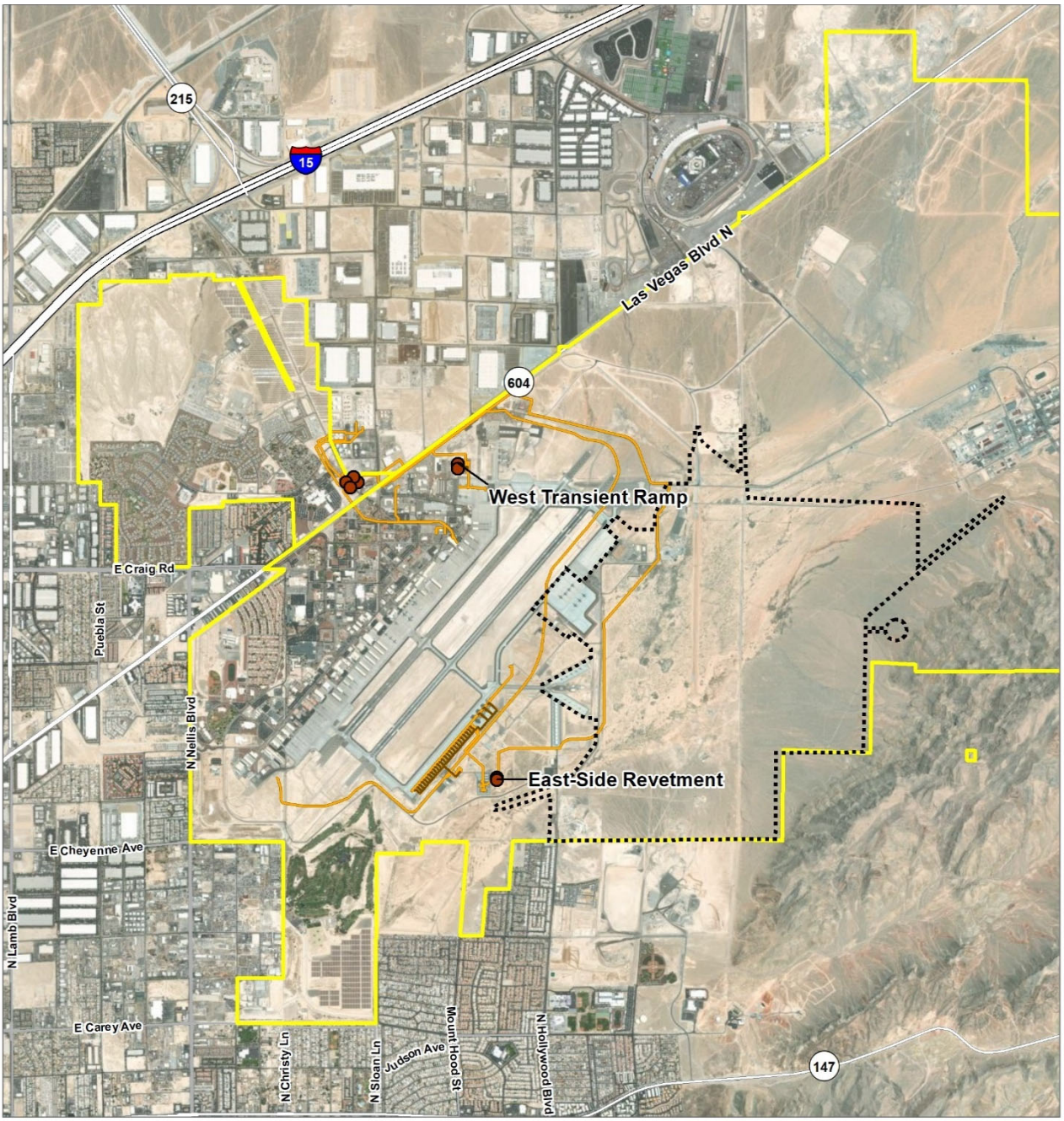
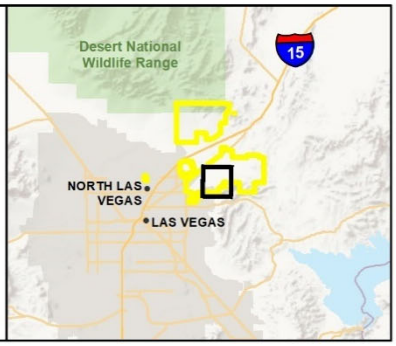


FIGURE 4.7-1
Nellis AFB Hydrant Fuel Utilities

Hydrant Fuel Storage Tank
Hydrant Fuel Distribution Pipeline
Defueling Line
Interstate Highway
State Highway
Major Road
Area of Potential Eastside Development
Installation Boundary

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



Hydrant fuel (Jet-A) storage on the Installation is provided by two operating storage tank facilities, including two 20,000-barrel tanks at the West Transient Ramp operational storage facility and two 10,000-barrel tanks on the East-side Revetment operational storage facility (Nellis AFB, 2020a). Jet-A bulk storage owned by Nellis AFB consists of four aboveground tanks with a total capacity of 47,400 barrels. Jet fuel is conveyed under North Las Vegas Boulevard to the aircraft service areas. Jet fuel, diesel, and gasoline are delivered to Nellis AFB by the CALNEV Pipeline (owned and operated by Kinder Morgan).

4.7.2 EXISTING DEMAND

During FY 2021 and FY 2022, an average of 25 million gallons of fuel per year was purchased to support installation needs and mission support (Nellis AFB, 2023c).

4.7.3 EXISTING HYDRANT FUEL SYSTEM DEFICIENCIES

The existing fuel system is considered to be in adequate condition. Existing and long-term hydrant fuel needs for the Installation are met by current infrastructure (Nellis AFB, 2020a).

4.8 TRANSPORTATION SYSTEM

4.8.1 EXISTING INFRASTRUCTURE

The transportation infrastructure located within the Installation is owned and maintained by Nellis AFB. Nellis AFB is in the process of completing a Transportation Management Plan (TMP) (Nellis AFB, 2023h) that provides an in-depth analysis of the physical and operational condition of the existing transportation system.

4.8.1.1 Gate Access

As shown on **Figure 4.8-1**, there are currently five gates that provide access to Nellis AFB east of Las Vegas Boulevard North. They include the Main Gate, Simons Gate, Beale Gate, Area II Gate, and Hollywood Gate, as described in further detail below.

4.8.1.1.1 Main Gate

The Main Gate is the primary access point to the Main Base (Area I) and is constructed to current AT/FP standards. This gate provides access to the Installation 24 hours a day. Large vehicles are not permitted to enter the Installation at the Main Gate.

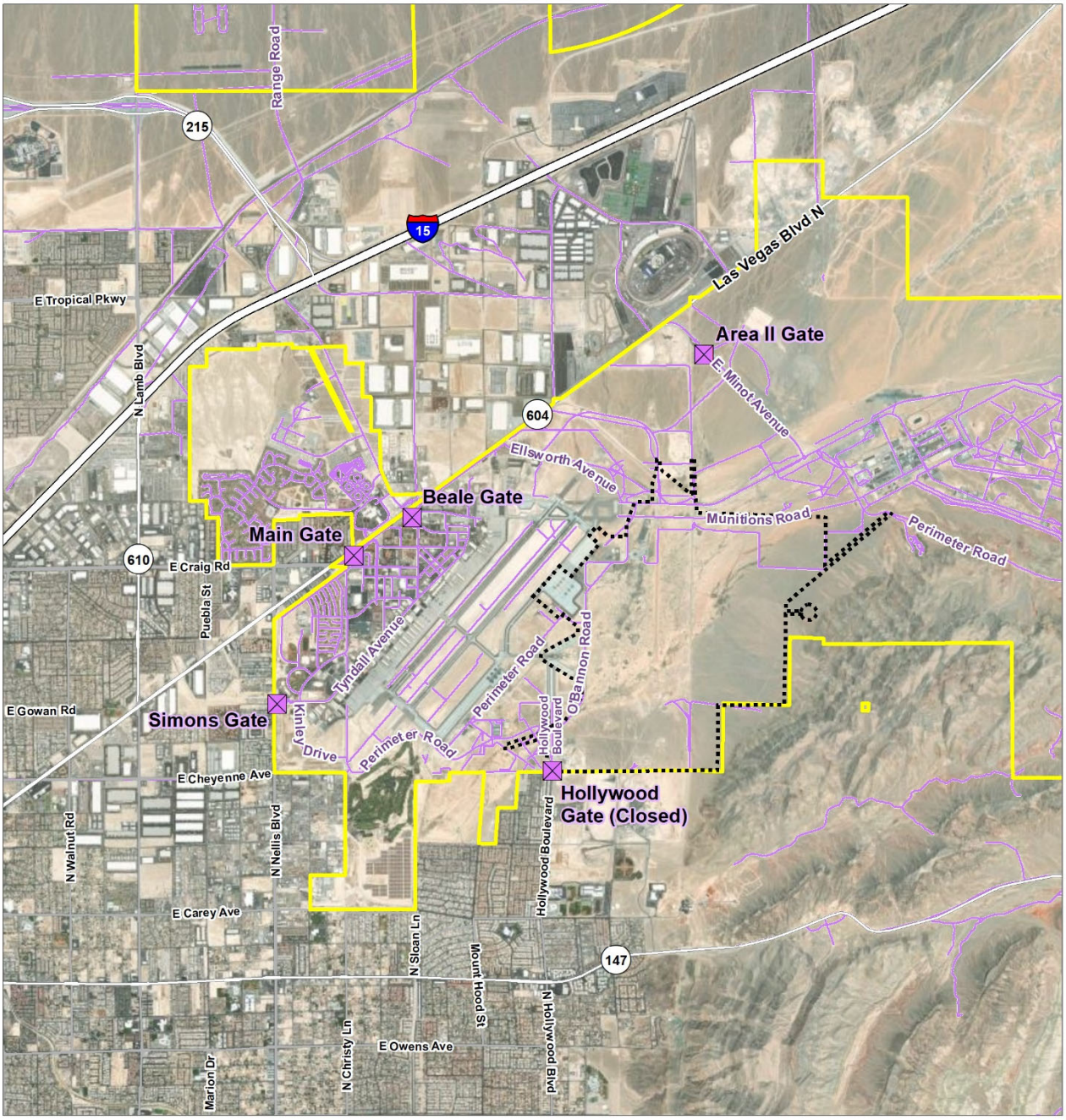
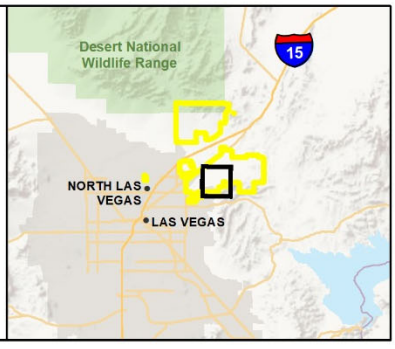


FIGURE 4.8-1
Nellis AFB Existing Transportation Network

Entry Gate
Interstate Highway
State Highway
Major Road
Base Road
Area of Potential Eastside Development
Installation Boundary

N
0 0.75 1.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



4.8.1.1.2 Simons Gate

Simons Gate provides access to the Main Base (Area I) and is constructed to current AT/FP standards. This gate is open Monday–Friday from 0530–0830 and 1530–1730 for personal vehicle access. No trucks may enter the Installation at Simons Gate.

4.8.1.1.3 Beale Gate

Beale Gate provides access to the Main Base (Area I) and is constructed to current AT/FP standards. This gate is open Monday–Friday from 0530–1730 for personal vehicle access. No trucks may enter the Installation at Beale Gate.

4.8.1.1.4 Area II Gate

The Area II Gate provides access to Area II and does not meet current AT/FP standards. The Area II Gate is the large vehicle inspection station and the required entrance for large vehicles entering Nellis AFB. Hours for commercial vehicles are Monday–Friday 0530–1300. The gate is open to personal vehicles Monday–Friday 0530–1700 and Saturday 0800–1200.

4.8.1.1.5 Hollywood Gate

Hollywood Gate is currently closed.

4.8.1.2 Roadways

Las Vegas Boulevard, which runs northeast-southwest through Nellis AFB and separates Area I from Area III, is a major regional artery connecting the Installation with downtown Las Vegas. East Craig Road intersects Las Vegas Boulevard North at the Nellis AFB Main Gate. It is also a major artery that funnels traffic from I-15 north of the Installation to Las Vegas Boulevard North. The Main Base (Area I) is bounded on the west by North Nellis Boulevard, which is a major north-south road that connects south Las Vegas with the city of North Las Vegas and Nellis AFB. The Area II Gate provides access from North Nellis Boulevard to Area I.

On the Installation, Nellis AFB has approximately 147 miles of paved roads. Intersections are controlled by stop signs, which can cause minor traffic delays. Unpaved roads are located in Areas II and III, with the majority located along the perimeter of the Installation, minimally used for fence maintenance and security.

As shown on **Figure 4.8-1,** the proposed east-side development area currently has limited roadway infrastructure, with the exception of:

- Munitions Road is a 2-lane, paved, uncurbed roadway that runs on the north side of the proposed east-side development area providing access to the munitions storage area and Area II.
- Perimeter Road is a 2-lane, paved, uncurbed roadway connecting the southwest side of Nellis AFB to the northeast side. Perimeter Road begins at Kinley Drive near the golf course and ends at O'Bannon Road on the northeast side of the runway.
- O'Bannon Road is a 2-lane, paved, uncurbed roadway connecting the southwest side of Nellis AFB to the northeast side. While Perimeter Road runs adjacent to the tarmac, O'Bannon Road runs completely outside the airfield operations. The roadway intersects Hollywood Boulevard with a roundabout providing access to the current closed Hollywood Gate.
- Hollywood Boulevard is 2-lane, paved, uncurbed roadway connecting Hollywood Avenue gate to O'Bannon Road and the east side of Nellis AFB.

4.8.2 Existing Level of Service and Gate Access Counts

LOS is an industry accepted metric for quantifying the traffic operations at an intersection. The LOS is a grade-based system with scores A through F based primarily on average vehicle delay during the peak hour. LOS scores between A through C are considered acceptable by most standards. LOS D is generally acceptable in urban situations. LOS E and F are generally not acceptable.

The Highway Capacity Manual defines the LOS grading for signalized and unsignalized intersections as a function of the average vehicle control delay as shown in **Table 4.8-1**.

Table 4.8-1 Highway Capacity Manual Level of Service Definitions

LOS	*Signalized Intersection*	*Unsignalized Intersection*
A	≤10 sec	≤10 sec
B	10–20 sec	10–15 sec
C	20–35 sec	15–25 sec
D	35–55 sec	25–35 sec
E	55–80 sec	35–50 sec
F	>80 sec	>50 sec

Legend: ≤ = less than or equal to; LOS = level of service.
Source: National Academies of Sciences, Engineering, and Medicine, 2022.

The LOS from the TMP are shown in **Table 4.8-2**. The intersection numbers are shown geographically in **Figure 4.8-2**.

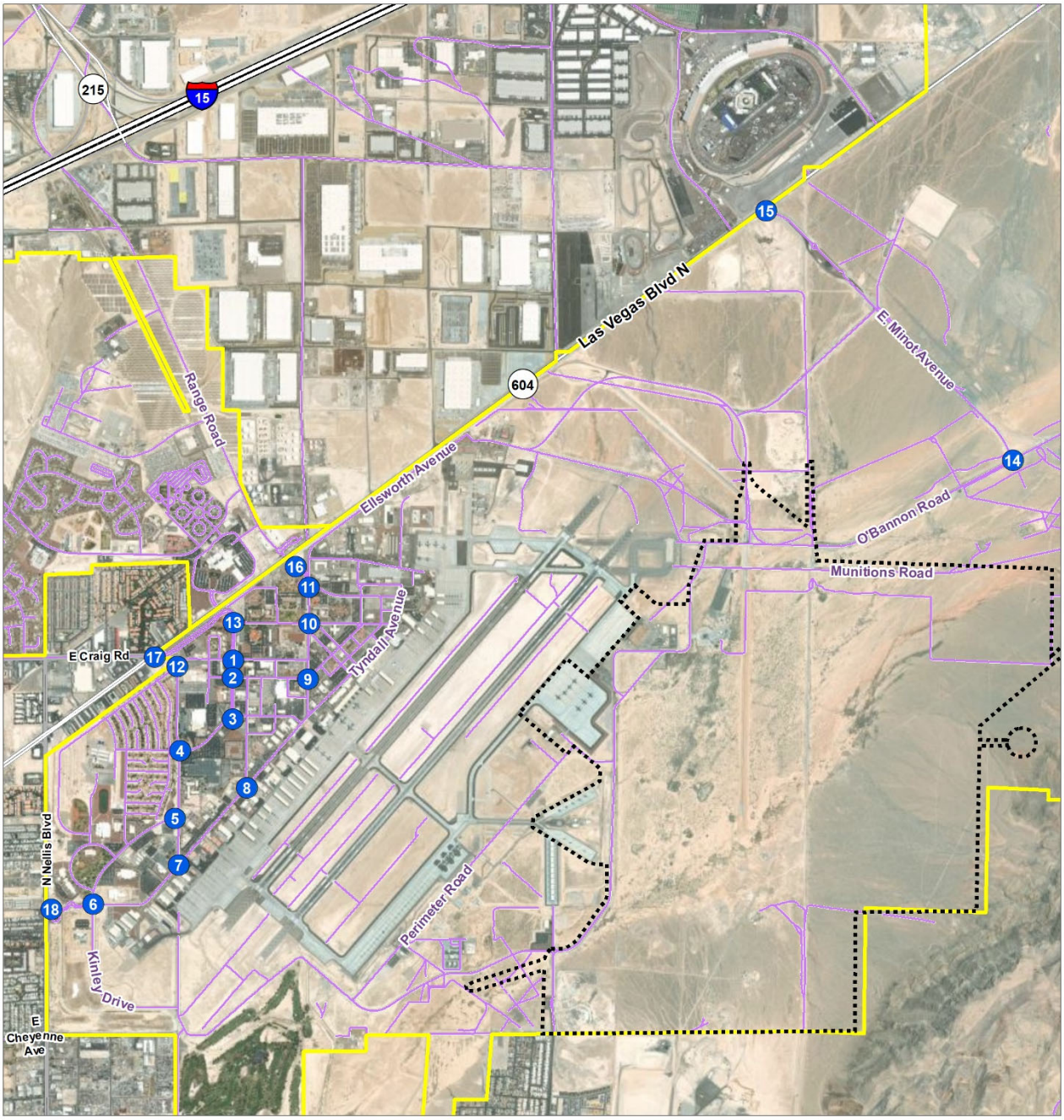


FIGURE 4.8-2
Nellis AFB Existing Intersection Traffic Count Locations

Intersection Traffic Count Location
Interstate Highway
State Highway
Major Road
Base Road
Area of Potential Eastside Development
Installation Boundary

N
0 0.45 0.9 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

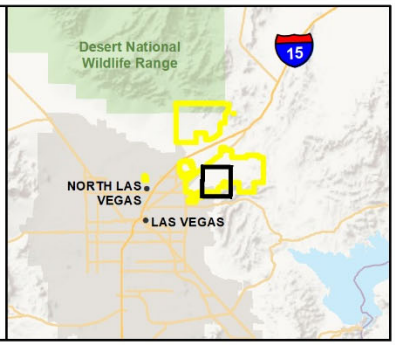


Table 4.8-2 2023 Existing LOS at Intersections within the Main Base (Area I) at Nellis AFB

#	*Intersection*	*AM Peak Hour*	*PM Peak Hour*
1	Washington Boulevard & Swaab Boulevard	B	C
2	Washington Boulevard & Devlin Drive	B	B
3	Washington Boulevard & Rickenbacker Road	B	B
4	Rickenbacker Road & Duffer Drive	A	B
5	Kinley Avenue & Duffer Drive	A	B
6	Kinley Avenue &Tyndall Avenue	A	A
7	Tyndall Avenue & Duffer Drive	A	A
8	Tyndall Avenue & Griffis Avenue	A	A
9	Ellsworth Avenue & Devlin Road	A	A
10	Ellsworth Avenue & Fitzgerald Boulevard	C	A
11	Ellsworth Avenue & Beale Avenue	A	C
12	Swaab Boulevard & Duffer Drive	A	A
13	Washington Boulevard & Fitzgerald Boulevard	B	D
14	O'Bannon Road & Minot Drive	A	A

Source: Nellis AFB, 2023h.

All intersections function at a LOS D or greater indicating no existing intersections at Nellis AFB are over capacity. The LOS D at Washington Boulevard and Fitzgerald Boulevard should continue to be monitored.

The TMP also completed counts and average processing time for the four open gates at Nellis AFB. The peak hour counts at each gate are shown in **Table 4.8-3**. The gate numbers are shown geographically in **Figure 4.8-2**. The Hollywood Gate was not assessed as it is currently closed.

Table 4.8-3 2023 Existing Traffic Counts at Nellis AFB Gates

Gate	*A.M. Peak Hour*		*P.M. Peak Hour*	
	Entry	*Exit*	*Entry*	*Exit*
Area II Gate	625	26	58	310
Beale Gate	728	187	262	815
Main Gate	728	238	454	815
Simons Gate	398	51	44	344

Legend: A.M. = morning; P.M. = evening.
Source: Nellis AFB, 2023h.

The TMP looked at the lanes required to process the peak hour traffic and the results of the recommended number of lanes at each gate are summarized in **Table 4.8-4**. The gate numbers are shown geographically in **Figure 4.8-2**.

Table 4.8-4 2023 Existing and Required Lanes at Gates

Gate	*Design Demand (vph)*	*Existing Lanes*	*Required Lanes*
Area II Gate	291	3	1
Beale Gate	744	2	3
Main Gate	754	2	3
Simons Gate	400	2	2

Legend: vph = vehicles per hour.
Source: Nellis AFB, 2023h.

The TMP concludes that both the Beale Gate and the Main Gate require additional lanes to meet operational requirements.

4.8.3 Existing Transportation System and Gate Deficiencies

The majority of Nellis AFB's transportation network was created in the 1950s. The transportation infrastructure has grown and evolved to meet the growing demands at Nellis AFB over time that has led to inefficient traffic patterns, higher traffic during peak hours, and conflict between vehicular and pedestrian traffic, in addition to AT/FP concerns (Nellis AFB, 2020a). Existing transportation infrastructure deficiencies include:

- The Area II Gate is not constructed to current AT/FP standards.
- The Main Gate requires additional lanes to meet operational requirements based on the design hourly volume.
- The Beale Gate requires additional lanes to meet operational requirements based on the design hourly volume.
- The intersection of Washington Boulevard and Fitzgerald Boulevard does not operate at an acceptable LOS during the PM (evening) peak hour.

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5.0 PROPOSED EAST-SIDE DEVELOPMENT AREA UTILITY SYSTEMS

This section defines the demands and loads associated with the proposed development with respect to each of the utility systems. The purpose of this section is to establish the guidelines and assumptions used to determine the infrastructure requirements associated with the facility upgrades. Conceptual layouts illustrating improvements and connections to existing infrastructure are provided in this section. This section ends with a summary of the deficiencies identified in the previous discussions and outlines the recommendations for upgrading the infrastructure systems to adequately support the plans and mission of Nellis AFB.

This document is a high-level planning assessment of the proposed east-side development area related to the development of the functional areas as described in Section 3.2. As such, estimates and assumptions (as described in each resource area below) were used to analyze proposed infrastructure needs as exact building dimensions, including location, quantity, square feet, and capacity of the proposed facilities are unknown.

5.1 POTABLE WATER SYSTEM

5.1.1 ALTERNATIVE 1 – COMPLETE BUILD-OUT

5.1.1.1 Proposed Potable Water Demand

The anticipated 10 percent growth (2,500 personnel) in the number of military and civilian personnel who live and work on the Installation over the next decade would remain the same under Alternative 1, Alternative 2, and the No Action Alternative; therefore, proposed potable water demand would be similar across all alternatives.

Potable water demand for the proposed east-side development area would increase by approximately 0.3 MGD, which is an approximate 18 percent increase in potable water demand compared to existing demand of 1.7 MGD (2020) (Nellis AFB, 2023b). This increase in demand is based on an average daily use of 120 GPD per person to accommodate an additional 2,500 personnel over the next 10 years (Nellis AFB, 2023b).

5.1.1.2 Proposed Potable Water System Infrastructure Upgrades

To support the proposed east-side development area at full build-out, approximately 43,000 linear feet of PVC water supply mains with a minimum 12-inch diameter to support fire flows would be required, as shown in **Figure 5.1-1**. Twelve-inch diameter water supply mains would be required near the connections to the existing southern portion of the Main Base (Area I) and to the northern connection point at Area II.

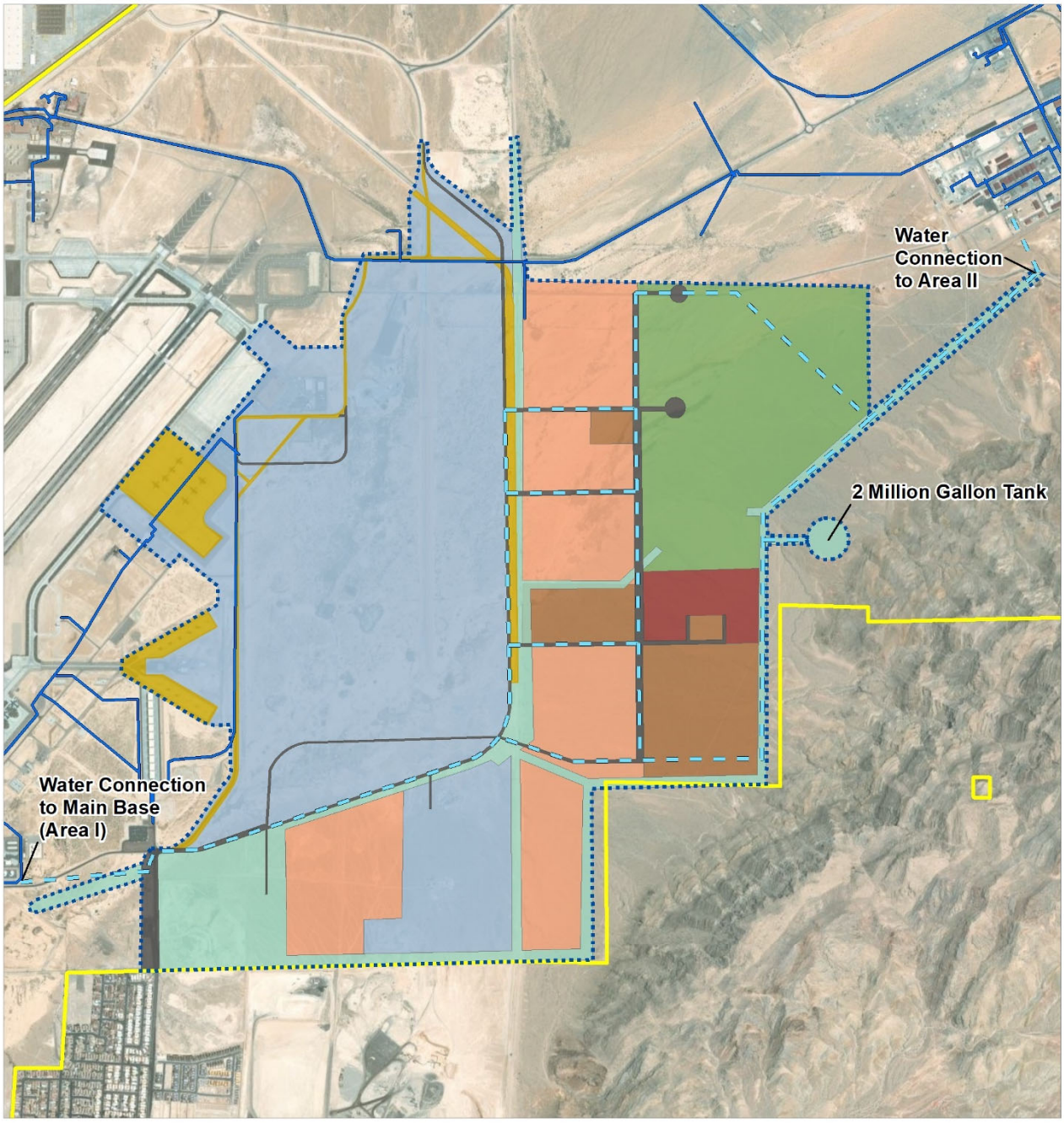


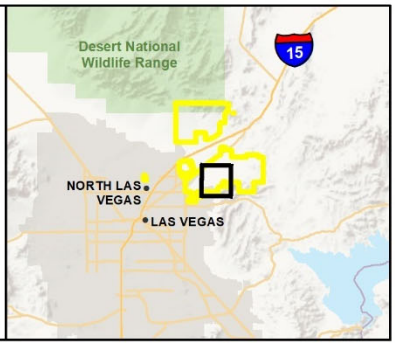
FIGURE 5.1-1
Nellis AFB Proposed Alternative 1 Potable Water Utilities

- Existing Potable Water Main Line
- Proposed Potable Water Line
- Alternative 1
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Lodging/Residential (Accompanied/Unaccompanied)
- Medical/Community Services/Community Commercial/Small-scale Retail
- Outdoor Recreation/Open Space/Training Space
- Transportation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



It is proposed that water supply be interconnected/looped with Area II and the Main Base (Area I); this would alleviate existing water quality issues resulting from dead ends in the system at Area II and improve installation-wide pressure. The proposed loop would connect the existing water supply lines from Area I and Area II and water would be supplied to the east-side development area through the existing SNWA intake located on North Nellis Boulevard. The existing NLVWD intake near Hollywood Gate would remain as an emergency or backup connection. Any expansion of the public water system would be coordinated with the Nevada Bureau of Safe Drinking Water.

The existing water distribution system is shallow (i.e., buried close to the surface), resulting in high internal temperatures in the pipes to the extent that the chlorine in the water evaporates and water quality and supply degrade. It is recommended that pipes be installed at least 4 feet below grade.

Individual building laterals would be constructed for each proposed building based on the needs and requirements of each building. Capacity within the east-side development area would be designed to meet the needs of the proposed buildings and partially correct the water supply issues on the Main Base (Area I). During construction, it would be necessary to expose, inspect, and possibly test existing potable water distribution lines on the east side to ensure that pressure increases from the additional development do not overload existing infrastructure, resulting in pipe failures. Replacement of the major supply lines should be considered.

5.1.1.2.1 Water Storage

To help support the additional potable water demand, a 2.0-million-gallon water tank, as shown in **Figure 5.1-1**, would be constructed (Nellis AFB, 2023b). The proposed water storage tank would help alleviate installation-wide pressure concerns within the water system. In addition, construction of an aeration system to ensure safe drinking water would assist in reducing chlorine degradation in the summer months and allow for longer water storage for mission essential needs or to address water vulnerability concerns.

5.1.1.2.2 Fire Protection

To support fire protection needs for the proposed east-side development area, a 2.0-million-gallon water tank, as shown in **Figure 5.1-1**, would be constructed that would help alleviate installation-wide pressure concerns within the water system. Fire protection needs vary with the physical characteristics of each building to be protected. Flow and pressure requirements for fire protection vary depending on occupancy hazard classifications, separation distances between buildings, height, materials of construction, size of the building, and the presence or absence of building sprinklers or other fire suppression systems. To determine sprinklered fire flow adequacy, hydraulic modeling would be conducted to determine flow and pressure requirements for building

sprinkler systems. Future pressure tests and design would determine if additional fire pumps would be required and the requirements for the pumps would be determined by each building project.

5.1.1.2.3 Water Supply and Quality

Further consideration should be given to the assessment of and mitigation for the long-term availability of water to Nellis AFB. The Installation relies on a steady water supply from Lake Mead, a water source supporting Arizona, California, Nevada, and portions of Mexico. As a result of a long-term drought and climate change, Lake Mead has been reaching historic lows in water availability and could present implications to future water security for Nellis AFB. All future mission growth must consider climate impacts in relation to mission resiliency, redundancy, security, and water supply (Nellis AFB, 2020b).

To prolong the availability and use of potable water at Nellis AFB, it is recommended the following measures are considered for the proposed east-side development area to decrease potable water demand:

- Ensure proposed landscaping design is water efficient
- Ensure low-flow plumbing fixtures are integrated into the design of the new facilities
- Eliminate potable water for outdoor use/irrigation
- Curtail waste by minimizing unrecoverable potable water losses
  - Termination of the Area II flushing system with a looped system that would connect the existing water supply lines from Area I and Area II
  - Implementation of hardening strategies for the water distribution system, including a deeper burial of distribution pipes
  - Improving the overall management of the distribution system by installation of a SCADA system.

Groundwater Wells

Currently, only two groundwater wells provide potable water: wells 2 and 8. Groundwater wells 11, 12, and 14 could be rehabilitated and filtered to provide an additional 575 acre-feet of potable water (Nellis AFB, 2020b). Nellis AFB could provide a reliable potable water back-up system to increase overall efficiency, provide operational flexibility, and buffer the potential impacts of drought conditions by rehabilitating the existing underground wells:

- Rebuild or re-drill existing wells to rehabilitate well infrastructure, as necessary
- Construct arsenic filter/removal plant to address arsenic contamination
- Expand backup power to ensure all wells are receiving sufficient backup power to maintain installation water supply during grid outages

There are currently several PFAS-impacted sites, including both groundwater and shallow soil sites, within the boundary of the east-side development area with associated groundwater monitoring wells. All water and soil disturbance activities associated with construction would include testing for the presence of PFAS as these compounds are known to have negative effects on human and animal populations and, if discovered, should be remediated (EPA 2024).

5.1.2 ALTERNATIVE 2 – PARTIAL BUILD-OUT

5.1.2.1 Proposed Potable Water Demand

Potable water demand for the proposed east-side development area under Alternative 2 would be similar to that as described under Alternative 1 as the proposed increase in personnel would be the same.

5.1.2.2 Proposed Potable Water System Infrastructure Upgrades

Alternative 2 is the partial build-out of the east-side development area reducing the development footprint compared to Alternative 1 while still meeting mid-term requirements for future growth. No new residential facilities would be constructed, and no outdoor recreation space, open space, and training space would be designated. Utilities and infrastructure improvements under Alternative 2 would occur on a smaller scale than under Alternative 1.

As shown in **Figure 5.1-2**, it is anticipated that approximately 41,000 linear feet of water main line would be required for Alternative 2. Since the potable water generation is based on a per capita generation, the size of the lines is not anticipated to be different from the Alternative 1 configuration.

5.1.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, proposed development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing potable water infrastructure as its number of personnel and mission continue to grow. Without development of the east side of Nellis AFB, existing potable water infrastructure at Nellis AFB could be insufficient to meet Air Force and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

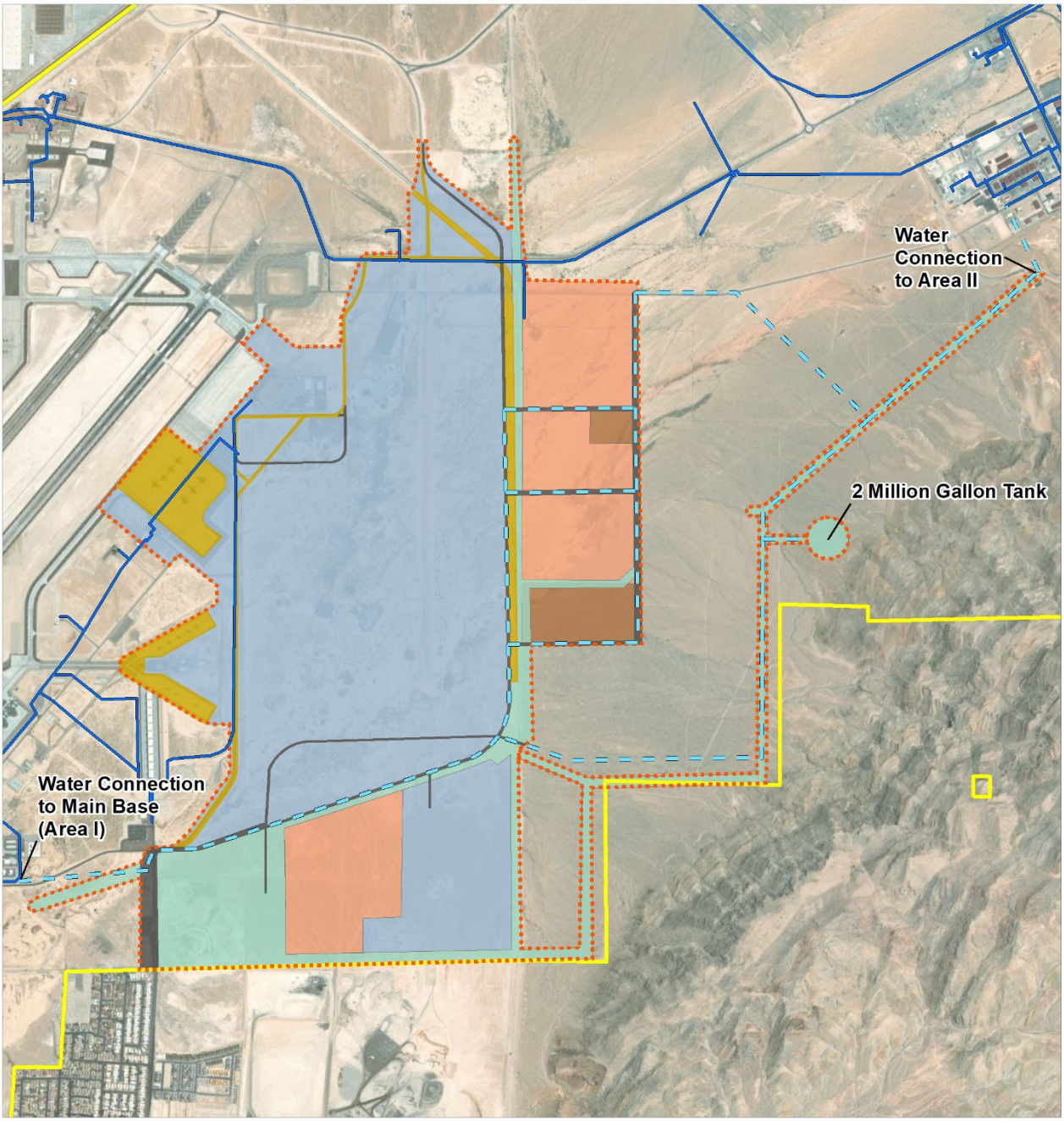


FIGURE 5.1-2
Nellis AFB Proposed Alternative 2 Potable Water Utilities

- Existing Potable Water Main Line
- Proposed Potable Water Line
- Alternative 2
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Medical/Community Services/Community Commercial/Small-scale Retail
- Transporation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

5.2 WASTEWATER SYSTEM

5.2.1 ALTERNATIVE 1 – COMPLETE BUILD-OUT

5.2.1.1 Proposed Wastewater Generation

The anticipated 10-percent growth (2,500 personnel) in the number of military and civilian personnel who live and work on the Installation over the next decade would remain the same under Alternative 1, Alternative 2, and the No Action Alternative; therefore, proposed wastewater generation would be similar across all alternatives. Wastewater generation for the proposed east-side development area is estimated at 300,000 GPD which is based on 120 GPD per person for 2,500 personnel (Nellis AFB, 2023b).

5.2.1.2 Proposed Wastewater System Infrastructure Upgrades

The proposed wastewater system for the east-side development area would be a separate system with a separate discharge point into the CCWRD Sloan Basin (Nellis AFB, 2023a); this system would not be connected to the existing system at the Main Base (Area I). Sewage conveyance trunk lines would be a minimum of 18-inch PVC with manholes placed at a minimum every 400 feet and at major junctions. As shown in **Figure 5.2-1**, approximately 25,000 linear feet of sewage piping would be proposed to support the east-side development area under Alternative 1.

Wastewater is anticipated to run south under the Hollywood Gate to the CCWRD-owned lines within Hollywood Boulevard. Discussions with CCWRD included understandings that future development south of the Hollywood Gate may impact CCWRD-owned lift stations and that the current gravity mains outside of the fence may need to be upgraded for proper operation (Nellis AFB, 2023a; See **Appendix A** for meeting minutes). Further design is required to determine if lift stations are required to discharge wastewater from the site. At this time, it is assumed that gravity sewers would be sufficient to reach the fence line and CCWRD-owned lines.

5.2.2 ALTERNATIVE 2 – PARTIAL BUILD-OUT

5.2.2.1 Proposed Wastewater Generation

Wastewater generation for the proposed east-side development area under Alternative 2 would be similar to that as described under Alternative 1 as the proposed increase in personnel would be the same.

5.2.2.2 Proposed Wastewater System Infrastructure Upgrades

Alternative 2 is the partial build-out of the east-side development area reducing the development footprint compared to Alternative 1 while still meeting mid-term requirements for future growth.

No new residential facilities would be constructed, and no outdoor recreation space, open space, and training space would be designated. Utilities, transportation, and infrastructure improvements under Alternative 2 would occur on a smaller scale than under Alternative 1. Wastewater infrastructure under Alternative 2 would remain similar to that as described under Alternative 1.

As shown in **Figure 5.2-2**, approximately 23,000 linear feet of sewage piping is proposed for Alternative 2, approximately 8 percent less than under Alternative 1. Since the sewage generation is based on a per capita generation, the size of the lines is not anticipated to be different from the Alternative 1 configuration.

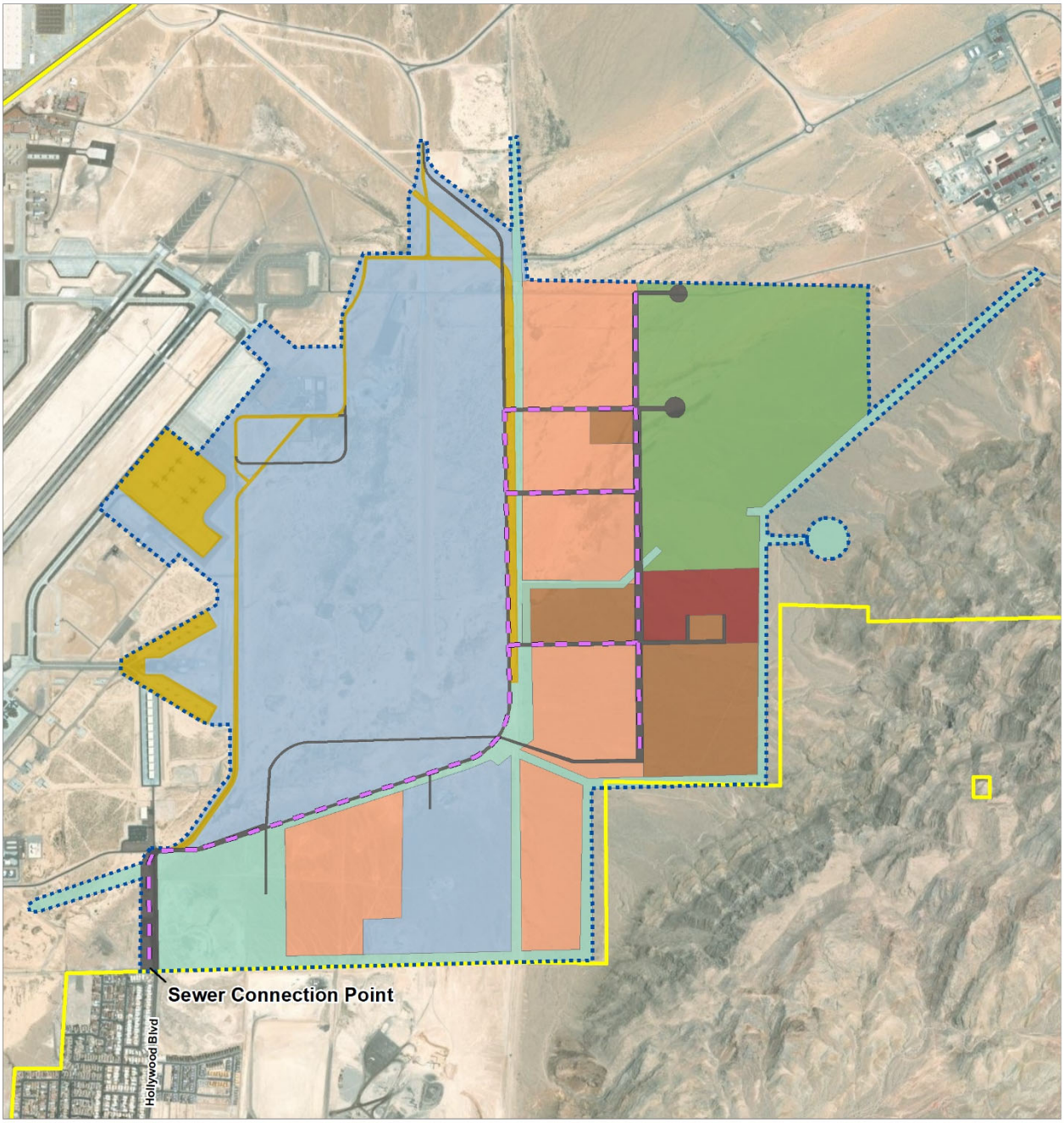


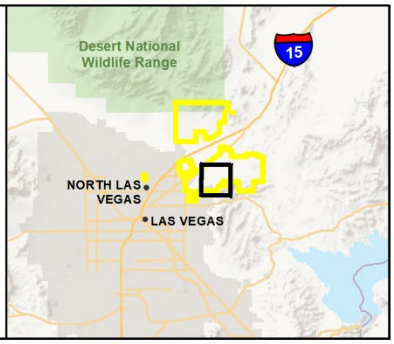
FIGURE 5.2-1
Nellis AFB Proposed Alternative 1 Wastewater Utilities

- Proposed Wastewater Line
- Alternative 1
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Lodging/Residential (Accompanied/Unaccompanied)
- Medical/Community Services/Community Commercial/Small-scale Retail
- Outdoor Recreation/Open Space/Training Space
- Transportation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



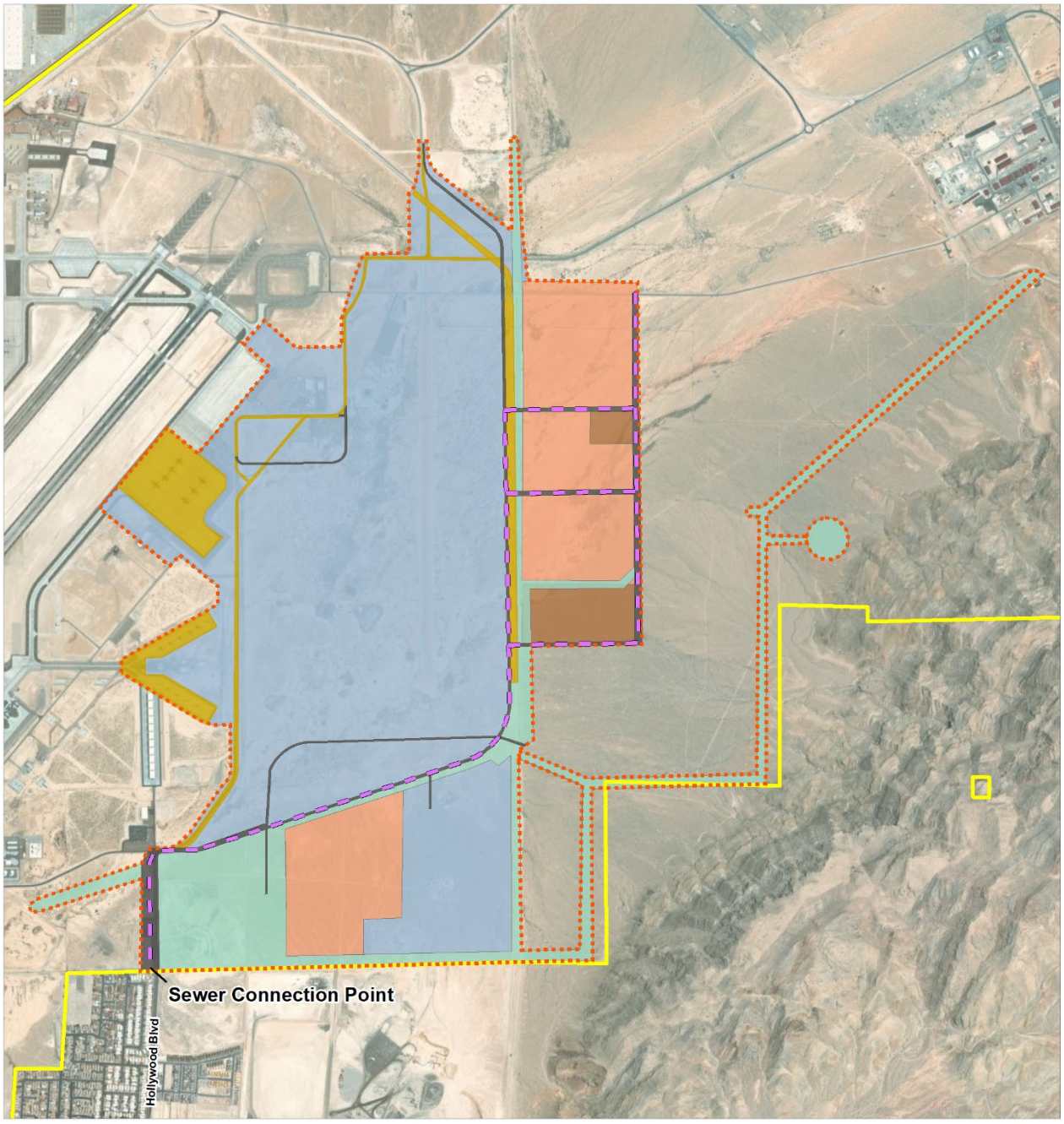


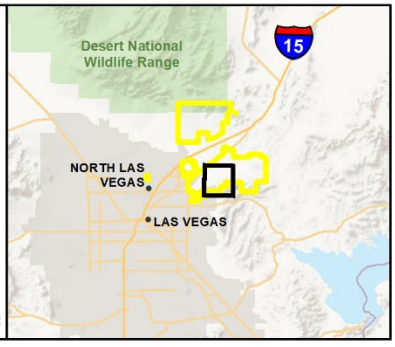
FIGURE 5.2-2
Nellis AFB Proposed Alternative 2 Wastewater Utilities

- Proposed Wastewater Line
- Alternative 2
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Medical/Community Services/Community Commercial/Small-scale Retail
- Transporation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



5.2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, proposed development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing wastewater infrastructure as its number of personnel and mission continue to grow. Without development of the east side of Nellis AFB, existing wastewater infrastructure at Nellis AFB could be insufficient to meet Air Force and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

5.3 STORMWATER MANAGEMENT SYSTEM

5.3.1 ALTERNATIVE 1 – COMPLETE BUILD-OUT

5.3.1.1 Proposed Stormwater Generation

After implementation of Alternative 1, the estimated increase in the amount of impervious surface would be 1,480 acres. **Table 3.1-2** lists the example projects that could occur within each functional category under Alternative 1, the approximate total acreage dedicated to each functional category, and the estimated amount of impervious surface coverage that would occur under each category.

5.3.1.2 Proposed Stormwater System Infrastructure Upgrades

There are two priorities for the east-side development area regarding stormwater management. The first is diversion of offsite stormwater runoff entering the site from Sunrise Mountain and the second is the management of onsite stormwater runoff increases as the result of development and associated increases in impervious surfaces.

5.3.1.2.1 Diversion of Offsite Stormwater Runoff from Sunrise Mountain

Stormwater diversion is required due to flooding encountered from Sunrise Mountain located to the east of the Installation. As runoff drains from the Sunrise Mountain toward the Installation, the runoff ponds and accumulates on the flight line, which restricts the ability of aircraft to take off and land (Nellis AFB, 2023d). As shown in **Figure 5.3-1,** a reinforced berm within the fence line would be designed to safely divert stormwater runoff from Sunrise Mountain around the east-side development area toward the proposed stormwater basin. A conceptual design of the diversion berm would include:

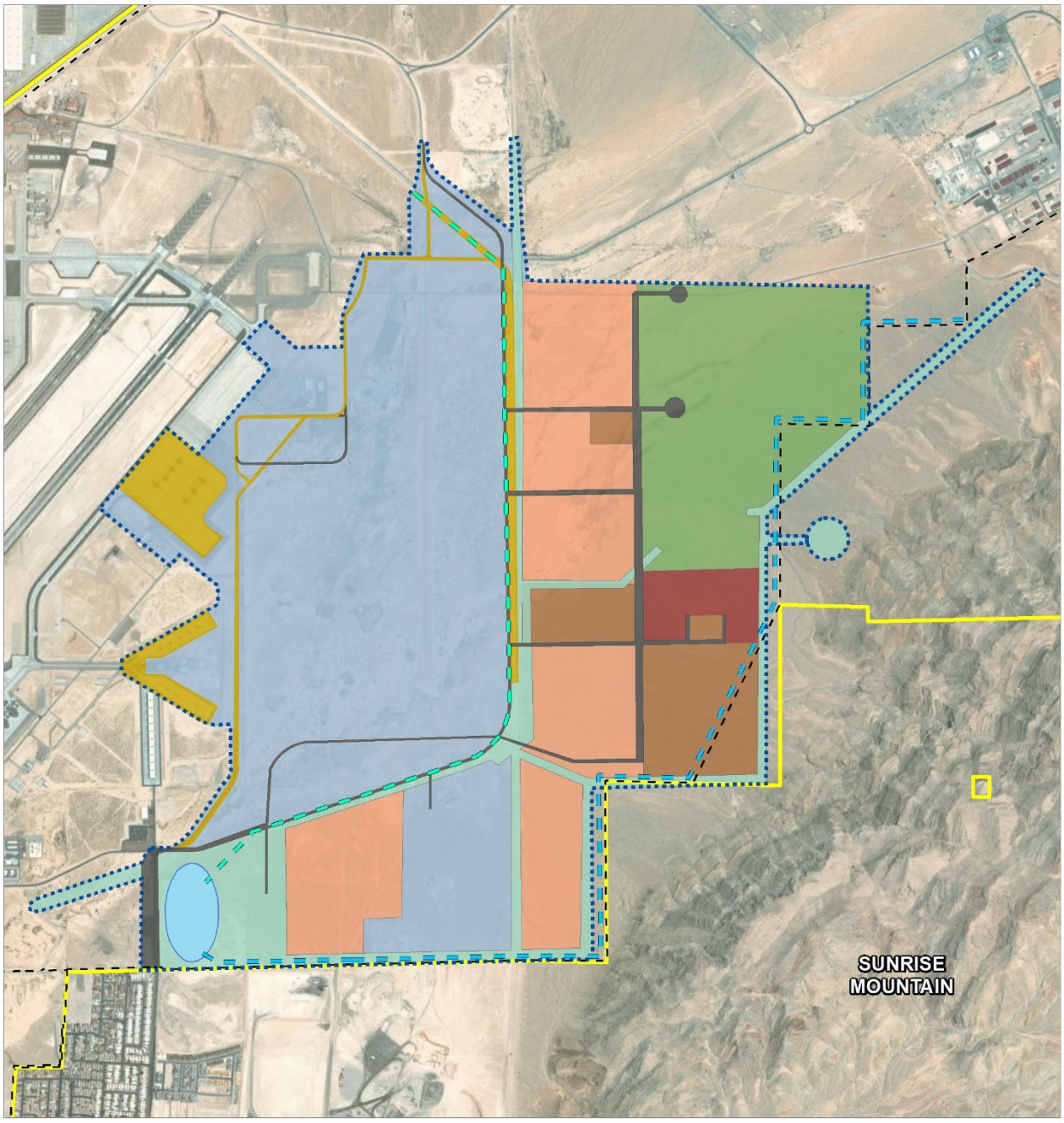


FIGURE 5.3-1
Nellis AFB Proposed Alternative 1 Stormwater Utilities

- Existing Fenceline
- Proposed Diversion Berm
- Proposed Flume
- Proposed Stormwater Basin
- Alternative 1
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Lodging/Residential (Accompanied/Unaccompanied)
- Medical/Community Services/Community Commercial/Small-scale Retail
- Outdoor Recreation/Open Space/Training Space
- Transportation (Proposed)
- Utilities/Infrastructure

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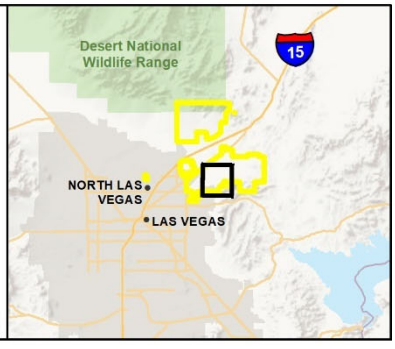
0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



- Earthen structure with 3:1 side slopes;
- 2–4 feet in height, 3–5-foot top width, 20,000 linear feet; and
- Concrete or riprap along the eastern side of the structure.

Stormwater culverts, open top flumes, or other support structures may also be required. Calculations detailing the assumptions for this proposed design can be found in **Appendix B.**

The proposed stormwater infrastructure would convey flood flows from Sunrise Mountain in a controlled manner, providing safe passage for vehicles to cross the Las Vegas Boulevard, Ellsworth Avenue, and Munitions Road without standing water, and provide improved flood security for Nellis AFB occupants, roadways, runways, and associated infrastructure.

5.3.1.2.2 Management of Onsite Stormwater Runoff

As a result of the proposed development, the increase in 1,480 acres of impervious surfaces would increase the stormwater generated on the site. The proposed stormwater system for the east-side development area would be a separate system from the Main Base (Area I) and would be composed of plastic pipes, culverts, natural swales, and concrete troughs.

As shown in **Figure 5.3-1,** stormwater rate control would be managed within the proposed development by the construction of the following stormwater management features per Nevada General Permit NVR100000:

- Stormwater Detention Basin: A stormwater detention facility would be constructed on the southwest corner of the east-side development area. This basin would not store water between storm events and would be required to manage the increase in peak rate between each of the 1- through 100-year storm events. It is estimated that the basin would be 10 feet deep with a top area of approximately 20 acres.
- Stormwater Flume: A 14,000 linear foot flume would be constructed as a continuation of the existing flume previously constructed by CCRFCD. The proposed flume would discharge to the proposed stormwater detention basin.

Further site design and analysis is required to determine final basin and conveyance sizing.

Nellis AFB maintains an active BASH plan (Nellis AFB 2016), as required under AFI 91-212, *BASH Management Program*. This plan is continually updated to address any potential changes in conditions at Nellis AFB. The goal of the BASH plan is to reduce the likelihood of an aircraft colliding with a bird or other wildlife, thereby causing potentially catastrophic damage to the aircraft or potentially the loss of life of the pilot from the damage. As new stormwater practices are proposed, there is a possibility of an increase in wildlife during or after stormwater events. The

proposed stormwater management facilities will not have permanent pools or be vegetated, which will limit the time stormwater resides near the Installation and reduce the likelihood of BASH.

5.3.2 ALTERNATIVE 2 – PARTIAL BUILD-OUT

5.3.2.1 Proposed Stormwater Generation

After implementation of Alternative 2, the estimated increase in the amount of impervious surface would be 1,216 acres (18 percent less impervious surface than Alternative 1), as shown in **Table 3.1-2.**

5.3.2.2 Alternative 2 – Partial Build-Out

As shown in **Figure 5.3-2**, Alternative 2 is the partial build-out of the east-side development area reducing the development footprint compared to Alternative 1 while still meeting mid-term requirements for future growth. No new residential facilities would be constructed, and no outdoor recreation space, open space, and training space would be designated. Utilities, transportation, and infrastructure improvements under Alternative 2 would occur on a smaller scale than under Alternative 1. Stormwater infrastructure under Alternative 2 would remain similar to that as described under Alternative 1.

5.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, proposed development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing stormwater infrastructure as its number of personnel and mission continue to grow. If the existing system is properly maintained, there are no present concerns about the Installation's existing stormwater infrastructure. The stormwater berm described in both Alternatives 1 and 2 should be considered as an independent project if the Installation does not complete the expansion.

5.4 ELECTRICAL SYSTEM

5.4.1 ALTERNATIVE 1 – COMPLETE BUILD-OUT

5.4.1.1 Proposed Electrical Demand

The anticipated 10 percent growth (2,500 personnel) in the number of military and civilian personnel who live and work on the Installation over the next decade would remain the same under Alternative 1, Alternative 2, and the No Action Alternative; therefore, proposed electrical demand would be similar across all alternatives.

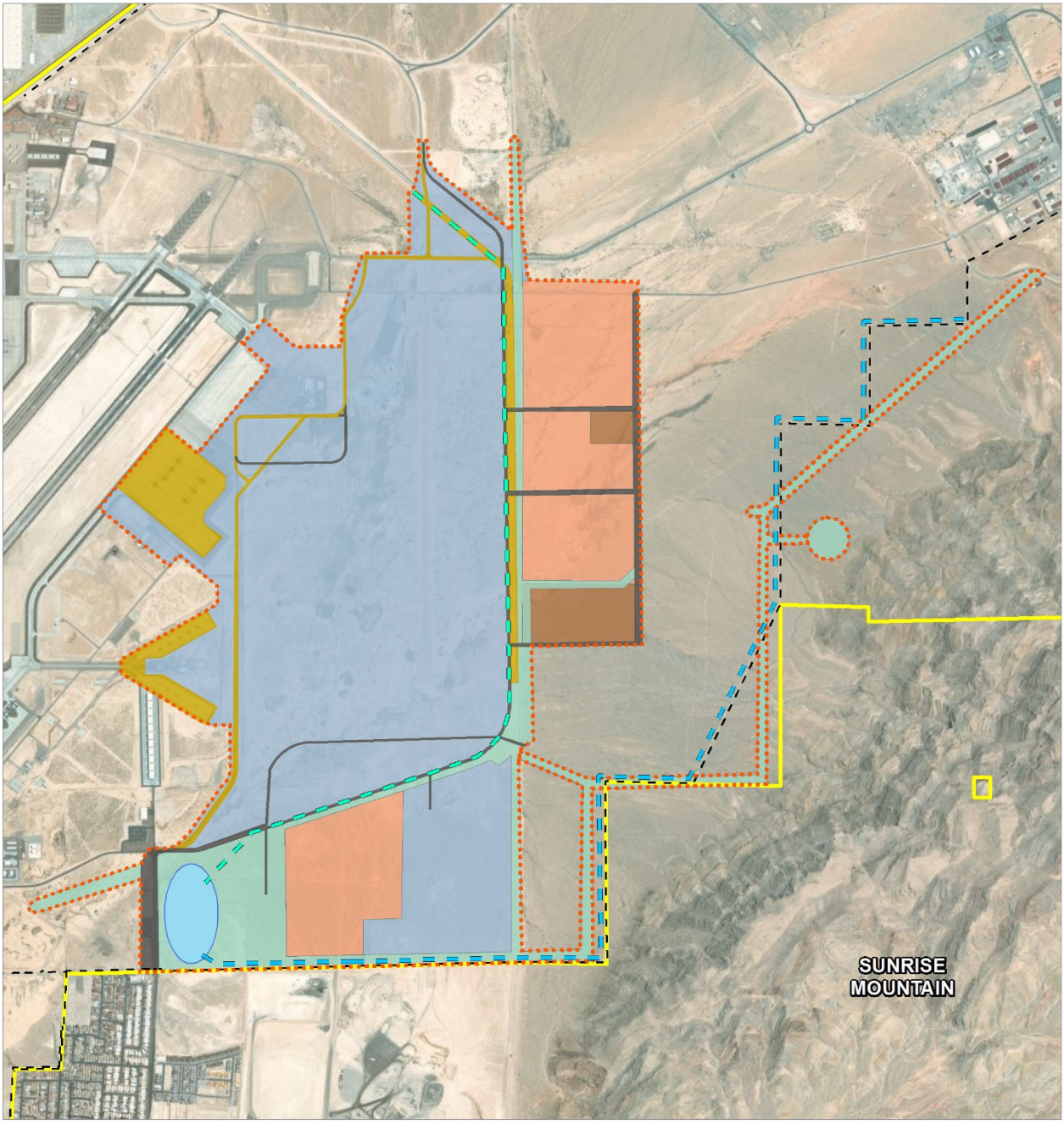


FIGURE 5.3-2
Nellis AFB Proposed Alternative 2 Stormwater Utilities

- Existing Fenceline
- Proposed Diversion Berm
- Proposed Flume
- Proposed Stormwater Basin
- Alternative 2
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Medical/Community Services/Community Commercial/Small-scale Retail
- Transporation (Proposed)
- Utilities/Infrastructure

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0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

Electrical demand for the proposed Alternative 1 east-side development area would increase by approximately 28 megawatts which is an approximate 121 percent increase compared to NVE metered peak electrical demand for the overall installation of 23.1 megawatts in July 2023 (NVE and Solor Star Electric, 2023). This increase in electricity demand is based on estimates of the functional areas from the proposed 2022 *Nellis AFB Master Plan Project List* indicating the future facilities growth to be approximately 3.8 million square feet and the high demand and coincident factors required to accommodate HVAC cooling requirements for an outdoor ambient temperature of 117 degrees and software download continuous electrical load requirements of the newer F22, F35, and NGAD aircraft, resulting in an additional demand on the order of 28 megawatts (see Table 5.4-1).

Table 5.4-1 lists the types of example projects that could occur within each functional category area under Alternative 1 as detailed in **Figure 3.2-1**, the approximate overall building square footage, and the estimated electrical load that would be associated with each category. Building estimated load data and demand factors are based upon UFC 3-501-01, *Electrical Engineering*, design data and Nellis AFB Electrical Engineer recommendations. Calculations detailing the assumptions for this proposed design can be found in **Appendix B.**

Table 5.4-1 Alternative 1 Estimated Electrical Demand

Functional Areas	*Example Projects*	*Est. Bldg. Size (SF)*	*Est. Demand (W/SF)*	*Est. Total Load (KW)*	*Service Demand Factor Percent*	*Est. Coincidence Factor Percent*	*Est. Load (KVA)*
Airfield Operations	**Terminals**	140,000	13.5	1,890	80%	60%	907
	Hangars	1,100,000	20	22,000	85%	85%	15,895
Industrial	**Maintenance Shops**	125,000	15	1,875	80%	70%	1,050
	Warehouse	200,000	8	1,600	75%	60%	720
Administration	**Auditoriums**	400,000	8	3,200	70%	60%	1,344
	Simulators	280,000	20	5,600	85%	85%	4,046
	Administration/ Security	250,000	8	2,000	65%	60%	780
	Training	600,000	8	4,800	70%	60%	2,016
Medical	**Fitness Center**	150,000	7	1,050	60%	60%	378
Community	**Food Court/ Shop**						
Commercial	**Commissary**						
Retail	**Exchange**						
Residential	**Dormitories**	440,000	6	2,640	40%	60%	634
Outdoor Recreation	**Parks**	0	0	0	0	0	0
	Playgrounds	0	0	0	0	0	0
Training	**Drop Zone**	0	0	0	0	0	0
	Roads	0	0	0	0	0	0

Functional Areas	*Example Projects*	*Est. Bldg. Size (SF)*	*Est. Demand (W/SF)*	*Est. Total Load (KW)*	*Service Demand Factor Percent*	*Est. Coincidence Factor Percent*	*Est. Load (KVA)*
Transportation	**Security Gate Areas**	0	0	0	0	0	0
Utilities	**Elect/Comms**	110,000	12	1,320	80%	60%	634
Infrastructure	**De-arsenic Plant**						
	Water Plant						
	Liquid Oxygen Plant						
Total		**3,795,000**		**47,975**			**28,403**

Legend: % = percent; Bldg. = Building; Est. = Estimated; KVA = Kilovolt Amp; KW = Kilowatt; SF = Square Foot; W/SF = Watts per Square Foot.
Source: Nellis AFB, 2022b; DoD, 2019.

5.4.1.2 Proposed Electrical System Infrastructure Upgrades

The unutilized electrical demand capacity available from the Northgate substation has been determined by the Installation to be approximately 12 MVA. This system is adequate for upgrades, renovations, and small capital projects within the existing built-out footprint of the Installation. The electrical demand for the east side development at full build-out has been approximated to be 28 MVA. This is 133 percent greater than the existing available Northgate substation unutilized capacity without taking any other possible mission growth into consideration. This excess demand would require installation of a new Nellis AFB-owned distribution South substation in the southeast corner of the proposed east-side development area. The South substation would be set back from the Installation fence line significantly enough to meet all AT/FP criteria. **Figure 5.4-1** shows the proposed Alternative 1 south substation and medium voltage distribution system one line and **Figure 5.4-2** shows the Alternative 1 site plan of the medium voltage distribution infrastructure system.

For redundancy and resiliency of the medium voltage distribution system, the new South substation capacity would match the 40-megawatt, 69 kV – 12.47Y/7.2kV rating of the existing Northgate substation. This would double the overall electrical capacity of the Installation to 80 MVA. The new South substation would have two 24/32/40 MVA (ONAN/FA/FA 55° Fahrenheit/65° Celsius) rated transformers to match the Northgate substation Transformer T1. The substation and main feeder lines would be required to be constructed prior to any east side development facility upgrades. Each transformer supplies one side of a 15 kV, double ended, metal clad medium voltage switchgear. Each switchgear section has a 2,000-amp rated main vacuum breaker with a normally open tie breaker between the two sections. The switchgear line up would be in a NEMA 3R/12 walk in enclosure. Four new 600-amp, redundant primary circuits originate from each side of the switchgear and extend throughout the functional areas in an interconnected loop system. One new spare 600-amp circuit would be included on each side for future expansion.

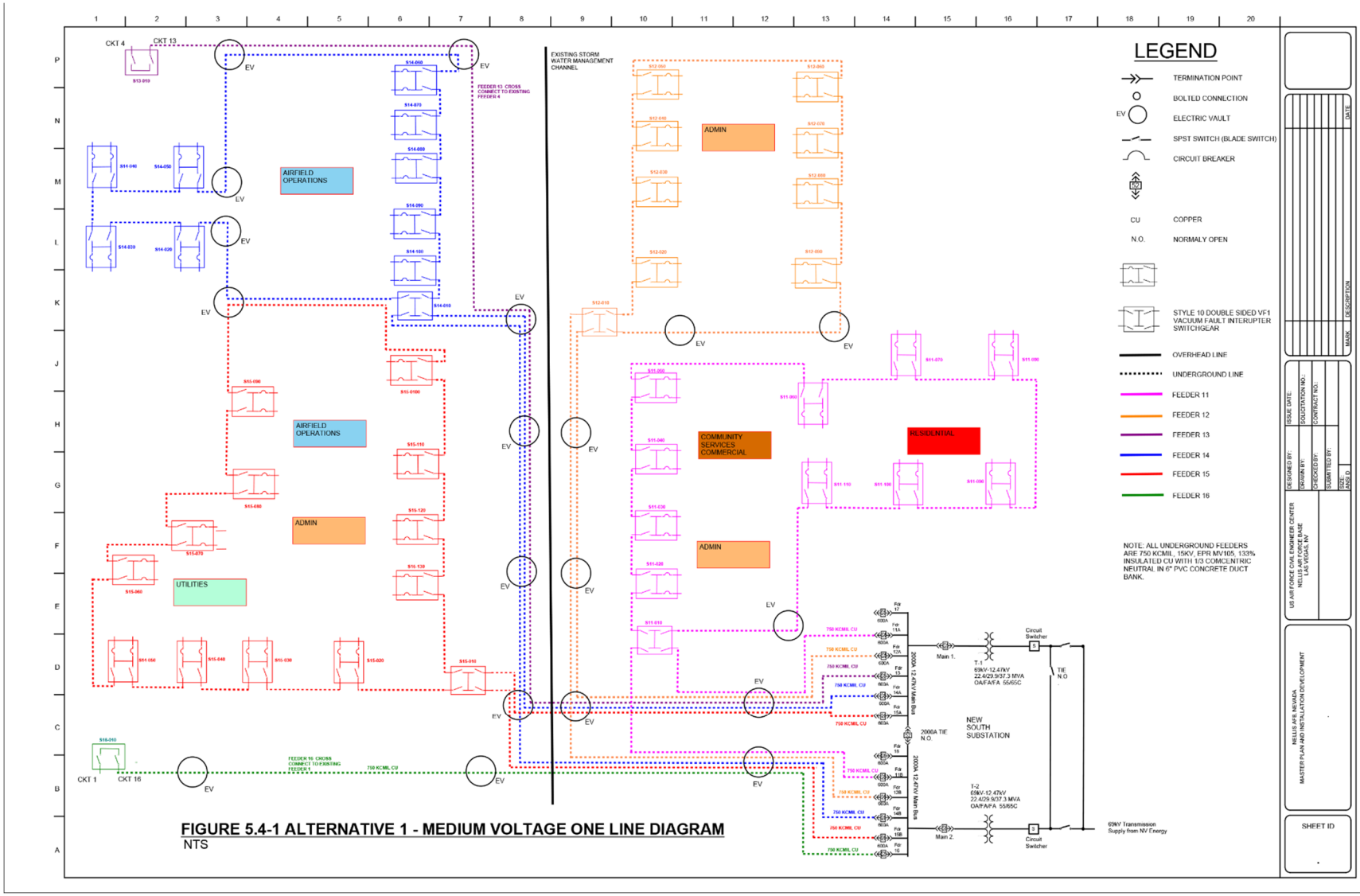

FIGURE 5.4-1 ALTERNATIVE 1 - MEDIUM VOLTAGE ONE LINE DIAGRAM
NTS

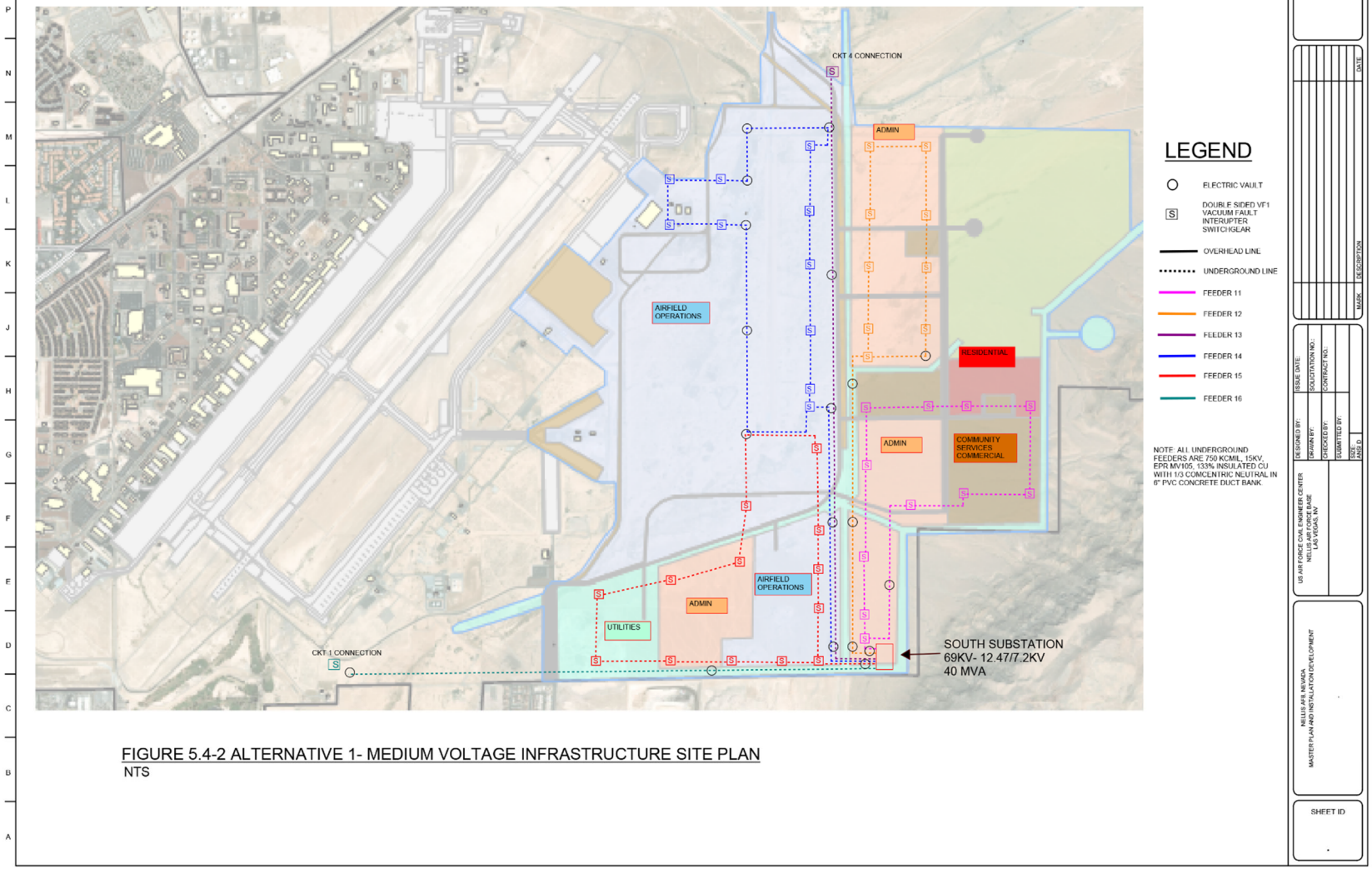

FIGURE 5.4-2 ALTERNATIVE 1- MEDIUM VOLTAGE INFRASTRUCTURE SITE PLAN
NTS

Additional 600, 900, or 1200-amp circuits would be interconnected to existing Northgate substation circuits #1 and #4.

NVE would be the utility providing the 69 kV medium voltage overhead electrical distribution system to the new South substation from outside the Installation. Per discussion with NVE, the capacity of their existing 69 kV sub-transmission circuit running overhead along East Carey Avenue is adequate to meet the anticipated demand of the South substation and east-side development area (See **Appendix A** for meeting minutes). This overhead circuit would be extended into the southeast corner of the Installation at the South substation location (Nellis AFB, 2023i).

The new east-side development 12.47kV distribution infrastructure designs are based upon UFC 3-550-01, *Exterior Electrical Power Distribution*, and requirements of the *Nellis-Creech AFB Installation Facilities Standards Appendix G – Electrical Standard*. These requirements include:

- Medium voltage distribution circuits to be installed in underground concrete-encased duct banks. All duct bank conduits shall be 6-inches diameter. All duct banks to be provided with a minimum of one spare conduit.
- Underground medium voltage cable to be a set of three 133 percent Ethylene Propylene Rubber insulated copper, 15 kV MV 105 cables, each with a 1/3 concentric neutral. Six-hundred-amp feeders to be sized 750 Thousand Circular Mills.
- All primary feeders shall be terminated or splices in distribution switchgear. The switchgear shall be 15 kV, 600-amp, 900-amp, or 1200-amp rated, dead front construction, double sided, oil insulated type with 200-amp Vacuum Fault Interrupting laterals for future connection to building service transformers. Medium voltage switches shall be mounted on precast pads with window openings to match the switch.
- Duct bank conduits would be terminated into handholes underneath the precast pads at the medium voltage switches or in precast electrical vaults with torsion assisted lids.
- Counterpoise ground rings are to be installed around all medium voltage switches (Nellis AFB, 2023j).
- Medium voltage switches, transformers, and sectionalizing cabinets cannot be mounted on top of manholes or vaults.

5.4.2 ALTERNATIVE 2 – PARTIAL BUILD-OUT

5.4.2.1 Proposed Electrical Demand

Alternative 2 is the partial build-out of the east-side development area reducing the development footprint compared to Alternative 1 while still meeting mid-term requirements for future growth. No new residential facilities would be constructed, and no outdoor recreation space, open space,

and training space would be designated. Utilities, transportation, and infrastructure improvements under Alternative 2 would occur on a smaller scale than under Alternative 1.

As shown in **Table 5.4-2**, the 2022 *Nellis AFB Master Plan Project List* (Nellis AFB, 2022b) associated with Alternative 2, indicates the future facilities growth to be approximately 2.4 million square feet, resulting in an additional demand on the order of 24 megawatts, 15 percent less than Alternative 1. Calculations detailing the assumptions for this proposed design can be found in **Appendix B.**

Table 5.4-2 Alternative 2 Estimated Electrical Demand

Functional Areas	*Example Projects*	*Est. Bldg. Size (SF)*	*Est. Demand (W/SF)*	*Est. Total Load (KW)*	*Service Demand Factor Percent*	*Est. Coincidence Factor Percent*	*Est. Load (KVA)*
Airfield Operations	**Terminals**	140,000	13.5	1,890	80%	60%	907
	Hangars	1,100,000	20	22,000	85%	85%	15,895
Industrial	**Maintenance Shops**	125,000	15	1875	80%	70%	1,050
	Warehouse	200,000	8	1,600	75%	60%	720
Administration	**Auditoriums**	400,000	8	3,200	70%	60%	1,344
	Simulators	280,000	20	5,600	85%	85%	4,046
	Administration/ Security	0	8	0	65%	60%	0
	Training	0	8	0	60%	60%	0
Medical	**Fitness Center**	50,000	7	350	60%	60%	126
Community	**Food Court/ Shop**						
Commercial	**Commissary**						
Retail	**Exchange**						
Residential	**Dormitories**	0	6	0	40%	60%	0
Outdoor Recreation	**Parks**	0	0	0	0	0	0
	Playgrounds	0	0	0	0	0	0
Training	**Drop Zone**	0	0	0	0	0	0
Transportation	**Roads**	0	0	0	0	0	0
	Security Gate Areas	0	0	0	0	0	0
Utilities	**Elect/Comms**	100,000	12	1,200	80%	60%	576
Infrastructure	**De-arsenic Plant**						
	Water Plant						
	Liquid Oxygen Plant						
Total		**2,395,000**		**37,715**			**24,664**

Legend: Bldg. = Building; Est. = Estimated, KVA = Kilovolt Amp; KW = Kilowatt; SF=Square Foot; W/SF= Watts per Square Foot.

Source: Nellis AFB, 2022b; DoD, 2019.

5.4.2.2 Proposed Electrical System Infrastructure Upgrades

Electrical demand under Alternative 2 for the proposed east-side development area partial build-out has been approximated at 24 megawatts. Electrical infrastructure upgrades as a result of implementation of Alternative 2 would be similar to that described under Alternative 1, including the installation of a new, 40-megawatt, Nellis AFB-owned electrical distribution South substation in the southeast corner of the Installation and the medium voltage distribution infrastructure throughout the functional areas.

Instead of the four new 600-amp, redundant primary circuits included in the Alternative 1 design, the Alternative 2 design would include three new 600-amp, redundant primary circuits originating from each side of the switchgear and extending throughout the functional areas in an interconnected loop system. Two new spare 600-amp circuits would be included on each side for future expansion. As with Alternative 1, additional 900 or 1200-amp circuits would be interconnected to existing Northgate substation circuits #1 and #4. **Figure 5.4-3** shows the proposed Alternative 2 south substation and medium voltage distribution system one line. **Figure 5.4-4** shows the Alternative 2 site plan of the medium voltage distribution infrastructure system.

5.4.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, proposed development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing electrical infrastructure as its number of personnel and mission continue to grow. Without development of the east side of Nellis AFB, existing electrical infrastructure at Nellis AFB could be insufficient to meet Air Force and DoD future mission requirements.

It is recommended that the medium voltage electrical distribution infrastructure system be developed and installed for the entire east-side development and integrated with Area II and Main Base (Area I) systems. A new substation should be installed along the southeast corner of the Proposed Action area and a new underground duct bank system should be installed adjacent to the roadways on either side of the stormwater diversion basin. New pad mount medium voltage switches, each with two service laterals, should be installed along the underground duct bank system for future extension of the medium voltage distribution system to new building service transformers.

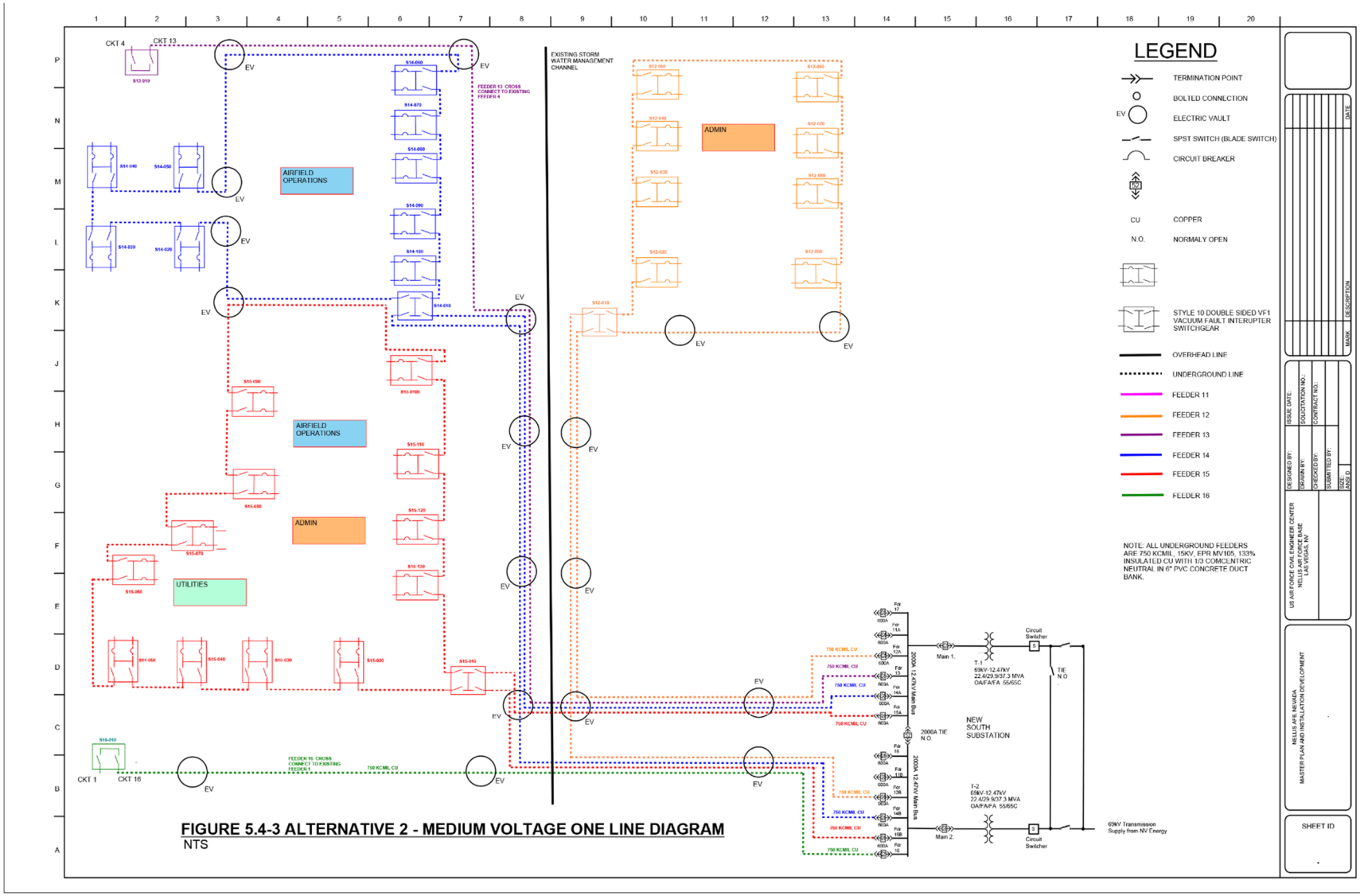

FIGURE 5.4-3 ALTERNATIVE 2 - MEDIUM VOLTAGE ONE LINE DIAGRAM
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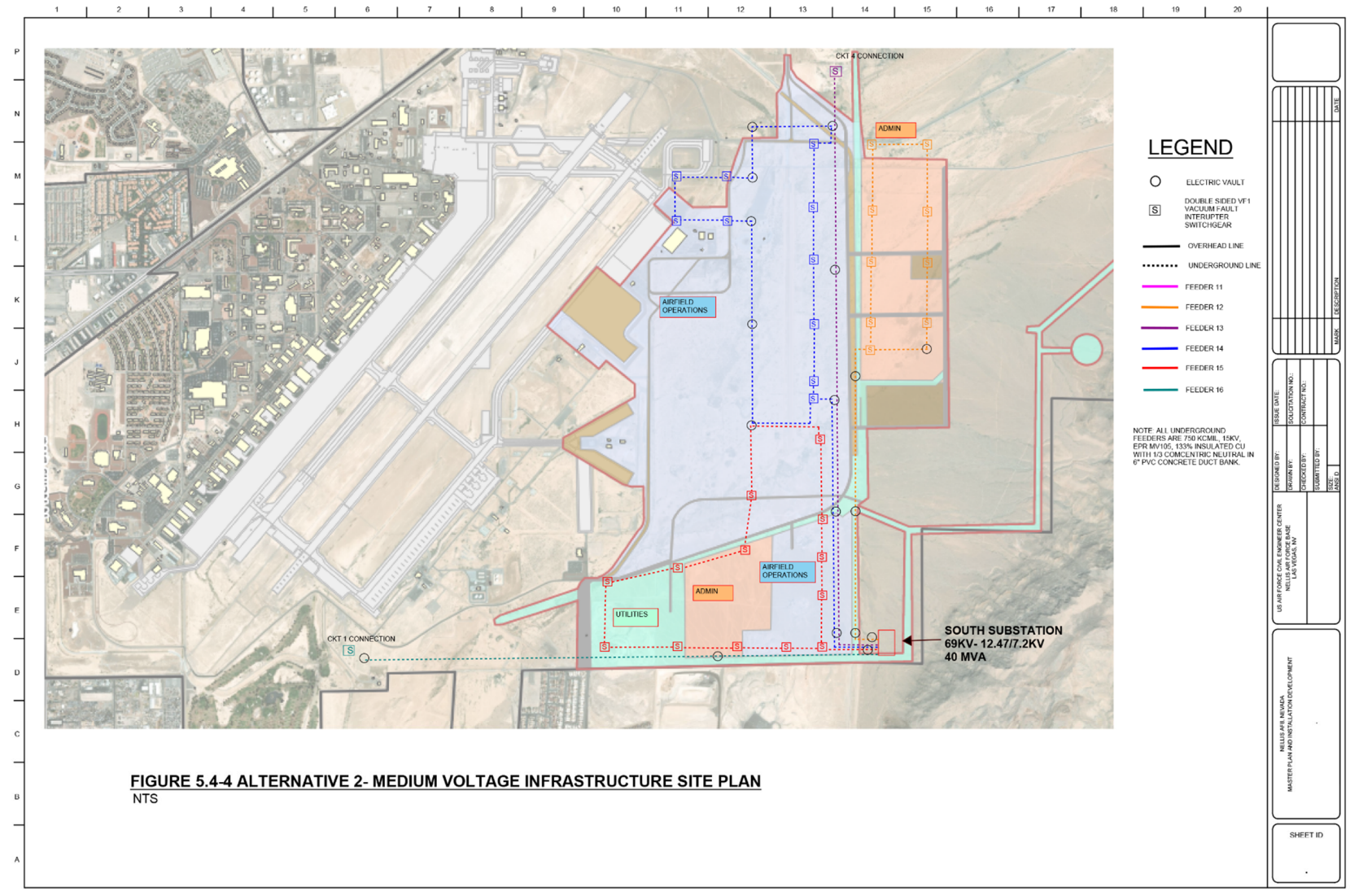


FIGURE 5.4-4 ALTERNATIVE 2- MEDIUM VOLTAGE INFRASTRUCTURE SITE PLAN
NTS

5.5 TELECOMMUNICATIONS SYSTEM

5.5.1 ALTERNATIVE 1 – COMPLETE BUILD-OUT

5.5.1.1 Proposed Telecommunications Demand

The anticipated 10 percent growth (2,500 personnel) in the number of military and civilian personnel who live and work on the Installation over the next decade would remain the same under Alternative 1, Alternative 2, and the No Action Alternative; therefore, proposed telecommunications infrastructure demand would be similar across all alternatives.

Under Alternative 1, per **Table 3.1-2**, the total east-side development area is estimated to be 2,001 acres. To support this acreage at full build-out, two new Information Transfer Buildings with minimum 1,000 square foot floor space with backup generator and an Uninterruptible Power Supply communications hubs and approximately 85,000 linear feet of underground duct bank telecommunications infrastructure pathways would be required.

5.5.1.2 Proposed Telecommunication System Infrastructure Upgrades

Each new building in the 2022 Nellis AFB Master Plan requires two, 4-inch data/communications service conduits to extend from the manholes associated with the data/communications pathway infrastructure system. Each service conduit shall include three 4-inch, 3-cell fabric mesh innerducts. A minimum of 12 strands of single mode fiber optic cable shall be directly connected from each building to an ITB (DoD, 2016). Command and Control mission facilities are Critical Edge Buildings and require redundant OSP fiber connections to at least two ITBs, all other facilities have OSP fiber connectivity to at least one ITB (Nellis AFB, 2023g). The service entrance conduits and single mode fiber would be included in the military construction funding for each individual building.

The infrastructure system shall include new ITBs and central pathways throughout the functional areas. As shown in **Figure 5.5-1**, one new ITB, Building 2892, to be located on the east side of the flight line near the control tower, is currently under construction. This facility would provide capacity for data/communications system connections to future flight line buildings including hangars, terminals, and other flight line area industrial operations. Additional ITBs would be required for the administrative, residential, community services, and utility facilities.

The new data/communications distribution infrastructure designs are based upon UFC 3-580-01, *Telecommunications Interior Infrastructure Planning and Design*, requirements of the Nellis and Creech AFB Addendum 2710 Building Telecommunications Cabling System, and Unified Facilities Guide Specifications section 33 82 00 *Telecommunications Outside Plant (OSP)*.

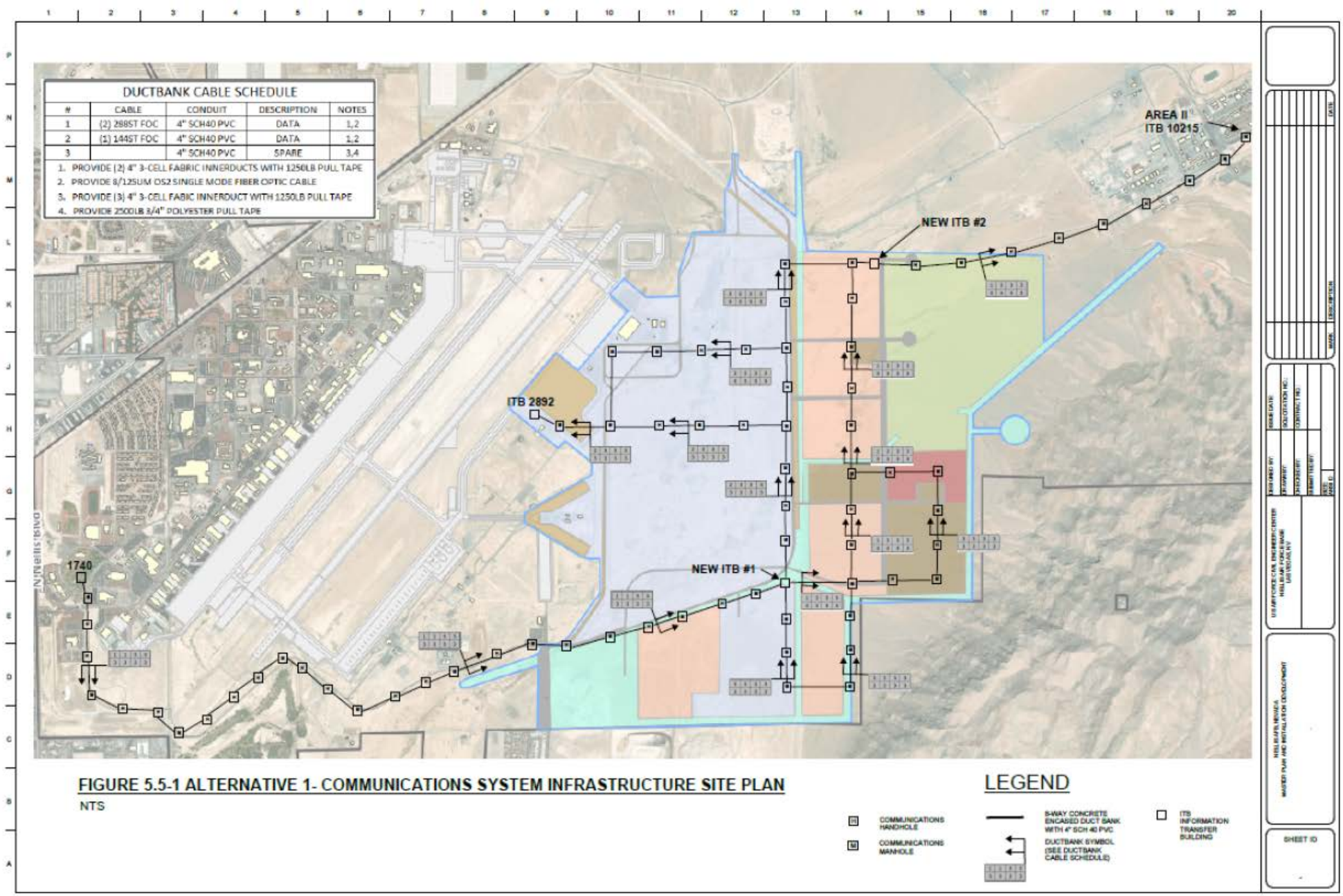


FIGURE 5.5-1 ALTERNATIVE 1- COMMUNICATIONS SYSTEM INFRASTRUCTURE SITE PLAN

NTS

The new east-side development data/communications fiber optic system shall originate in existing Building 1740 in Area I, and in Building 10215 in Area II.

New manholes, handholes, and a new 8-way concrete encased duct bank with 4-inch ducts, shall provide a pathway from Building 1740, around the south end of the flight line, and from Building 10215, along the northern road to Area II, to two new ITBs in the Proposed Action area. Continuous duct bank runs shall not exceed 500 feet in length without a manhole or handhole. Cabling from Area I Building 1740 and Area II Building 10215 to each new ITB shall consist of two, 288-strand OS2 fiber optic cables. An additional 8-way concrete encased duct bank shall extend from the under construction ITB, Building 2892 to the central pathway infrastructure and shall provide pathway connections between the three ITBs to allow for future mission sustainment and expansion. Each new ITB shall include a minimum of 1,000 square feet of floor space with a backup generator and an Uninterruptible Power System.

The central pathway infrastructure from the ITBs throughout the Proposed Action shall include new 8-way concrete encased duct banks, with 4-inch ducts, along the east and west sides of the central stormwater diversion channel and throughout the southernmost functional areas. Each pathway conduit shall include three 4-inch, 3 cell fabric mesh innerducts. Continuous duct bank runs shall not exceed 500 feet in length without a manhole or handhole. Manholes shall be distributed throughout the functional areas to accommodate connections to multiple buildings.

Communications manholes shall consist of pre-cast concrete boxes, extensions, and covers and shall be 7-feet-high by 12-feet-long by 6-feet-wide. Communication handholes shall be a minimum of 4-feet-high by 4-feet-long by 4-feet-wide (Nellis AFB, 2023g). **Figure 5.5-1** shows the proposed Alternative 1 telecommunications infrastructure site plan.

5.5.2 ALTERNATIVE 2 – PARTIAL BUILD-OUT

5.5.2.1 Proposed Telecommunications Demand

Alternative 2 is the partial build-out of the east-side development area reducing the development footprint compared to Alternative 1 while still meeting mid-term requirements for future growth. No new residential facilities would be constructed, and no outdoor recreation space, open space, and training space would be designated. Utilities, transportation, and infrastructure improvements under Alternative 2 would occur on a smaller scale than under Alternative 1.

Under Alternative 2, the total east-side development area is estimated to be 1,482 acres (see **Table 3.1-3)**. To support this acreage at partial build-out, one new communications hub and approximately 70,000 linear feet of underground duct bank telecommunications infrastructure pathways would be required, 20 percent less than under Alternative 1.

5.5.2.2 Proposed Telecommunication System Infrastructure Upgrades

The proposed 2022 *Nellis AFB Master Plan* project list associated with Alternative 2 indicates the future facilities growth to be approximately 2.4 million square feet. As a result of implementation of Alternative 2, the telecommunication system infrastructure upgrades would include the pathways from Area I Building 1740 and Area II Building 10215, the service conduits from each new building, and the central pathways to the ITB facilities, all similar to that described under Alternative 1.

One new ITB, Building 2892, to be located on the east side of the flight line near the control tower, is currently under construction. This facility would provide capacity for data/communications system connections to future flight line buildings including hangars, terminals, and other flight line area industrial operations. The infrastructure system shall include two additional new ITBs and central pathways throughout the functional areas for the administrative and utility facilities. Each new ITB shall include a minimum of 1,000 square feet of floor space with a backup generator and an Uninterruptible Power System.

Expansion beyond the Alternative 2 functional areas would be achieved by extension of the underground duct bank pathway network from any of the telecommunications' manholes. **Figure 5.5-2** shows the proposed Alternative 2 telecommunications infrastructure site plan.

5.5.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, proposed development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing telecommunications infrastructure systems as its number of personnel and mission continue to grow. Without development of the east side of Nellis AFB, existing electrical infrastructure could be insufficient to meet Air Force and DoD future mission requirements.

New communications system capacity would be limited by the capacity of the new ITB Building 2121 near the control tower which could accommodate communications system connections to future east side hangars, terminals, and other flight line area industrial operations. The existing west side infrastructure is limited by the lack of available duct bank capacity and equipment floor space within the existing west side ITBs.

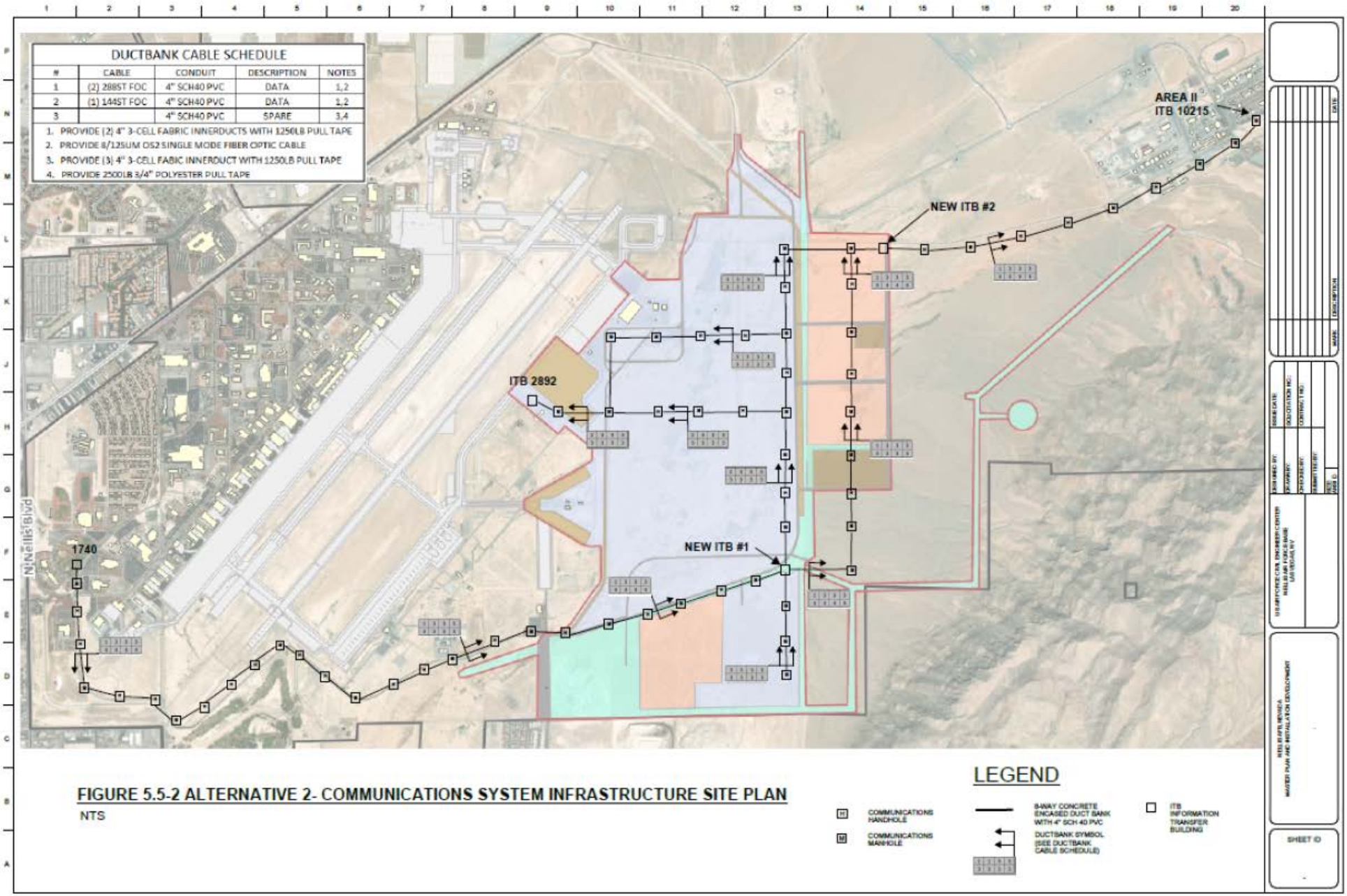


FIGURE 5.5-2 ALTERNATIVE 2- COMMUNICATIONS SYSTEM INFRASTRUCTURE SITE PLAN

NTS

5.6 NATURAL GAS SYSTEM

5.6.1 ALTERNATIVE 1 – COMPLETE BUILD-OUT

5.6.1.1 Proposed Natural Gas Demand

The anticipated 10 percent growth (2,500 personnel) in the number of military and civilian personnel who live and work on the Installation over the next decade would remain the same under Alternative 1, Alternative 2, and the No Action Alternative. Based on discussions with Installation personnel, the Installation is proposing to use natural gas for water and building heating (Nellis AFB, 2023k; See **Appendix A** for meeting minutes).

Natural gas demand for the proposed east-side development area would increase by a peak of approximately 1.6 trillion BTU, assuming the whole year is run at peak demand, which is an approximate 1 percent increase compared to existing natural gas demand of 152 trillion BTU in 2022. This increase is based on peak natural gas loads estimated at a peak demand of 192 million BTU per hour based on approximately 3.8 million square feet of building, a heating peak rate of 32 BTU per hour per square feet, and a water heating rate of 20 BTU per hour per square feet.

5.6.1.2 Proposed Natural Gas System Infrastructure Upgrades

During interviews with Southwest Gas, a representative stated that the existing distribution line on the east-side development area would be utilized for the proposed development (Nellis AFB, 2023k). The proposed east-side development area would construct a completely independent natural gas system from the rest of the Installation. A new gas meter would be installed in coordination with Southwest Gas, which would be coordinated with the utility by the designer. Approximately 21,000 linear feet of natural gas lines that consist of 8-inch minimum HDPE tubing would be installed under the roadway, as shown in **Figure 5.6-1**. Service laterals would require further design and location at the time of construction.

Coordination with Southwest Gas would be required to finalize design and confirm layout. To accurately assess the proposed infrastructure, a complete list of appliances and their BTU ratings are needed for the proposed buildings.

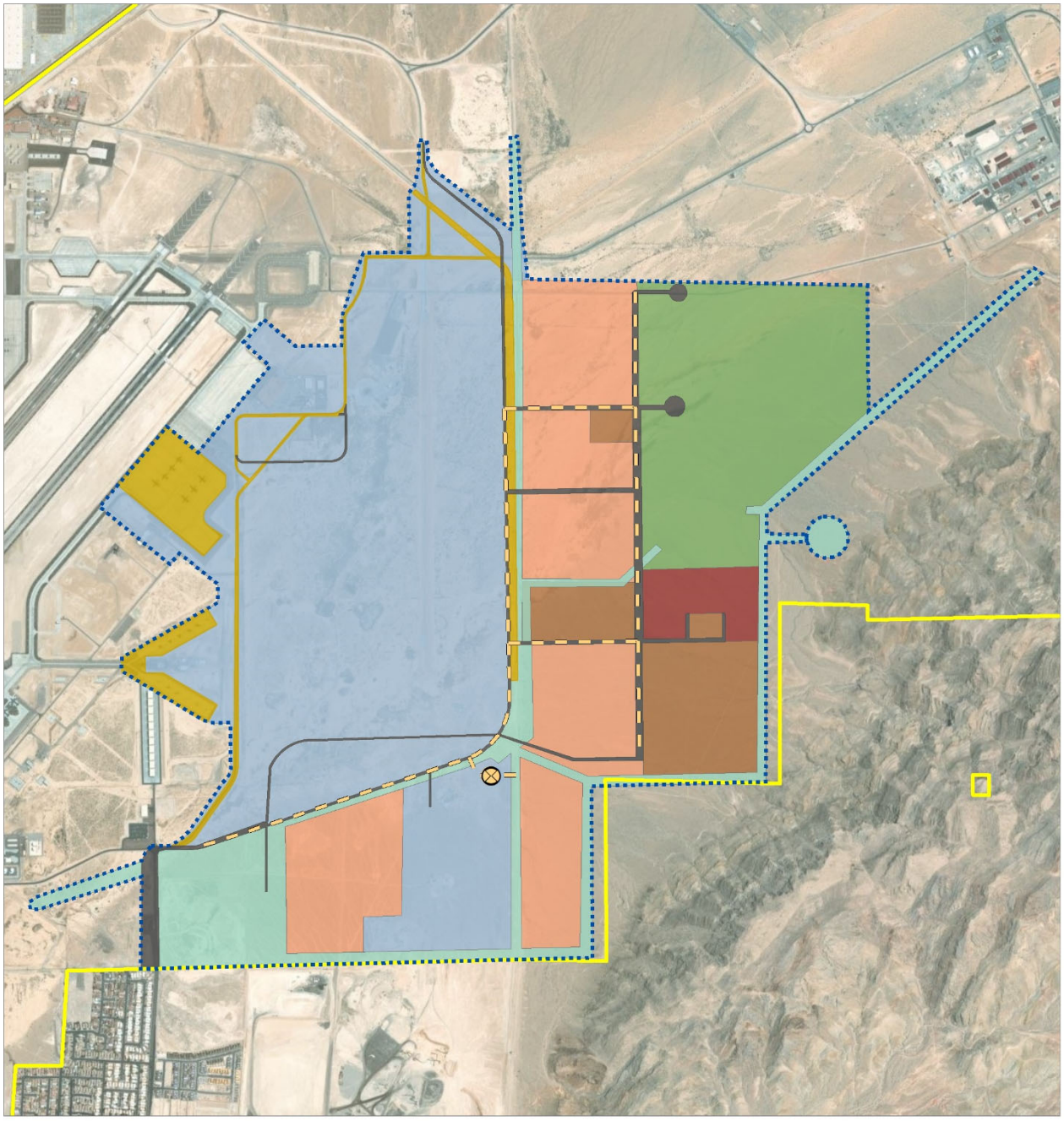


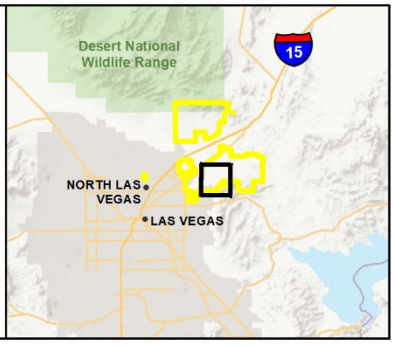
FIGURE 5.6-1
Nellis AFB Proposed Alternative 1 Natural Gas Utilities

- Proposed Gas Meter
- Proposed Natural Gas Line
- Alternative 1
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Lodging/Residential (Accompanied/Unaccompanied)
- Medical/Community Services/Community Commercial/Small-scale Retail
- Outdoor Recreation/Open Space/Training Space
- Transportation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



5.6.2 ALTERNATIVE 2 – PARTIAL BUILD-OUT

5.6.2.1 Proposed Natural Gas Demand

Natural gas demand for the proposed east-side development area under Alternative 2 would increase by approximately 1.1 trillion BTU assuming the whole year is run at peak demand, which is an approximate 0.7 percent increase compared to existing natural gas demand of 152 trillion BTU in 2022. This increase is based on peak natural gas loads estimated at a peak demand of 192 million BTU/H based on approximately 2.4 million square feet, 40 percent less than Alternative 1.

5.6.2.2 Proposed Natural Gas System Infrastructure Upgrades

Alternative 2 is the partial build-out of the east-side development area reducing the development footprint compared to Alternative 1 while still meeting mid-term requirements for future growth. No new residential facilities would be constructed, and no outdoor recreation space, open space, and training space would be designated. Natural gas infrastructure under Alternative 2 would remain similar to that as described under Alternative 1. Approximately 19,500 linear feet of natural gas lines of 8-inch minimum HDPE tubing would be installed under the roadway, as shown in **Figure 5.6-2**.

5.6.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, proposed development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing natural gas infrastructure as its number of personnel and mission continue to grow. If the existing system is properly maintained, there are no present concerns about the future of the Installation's gas supply or distribution.

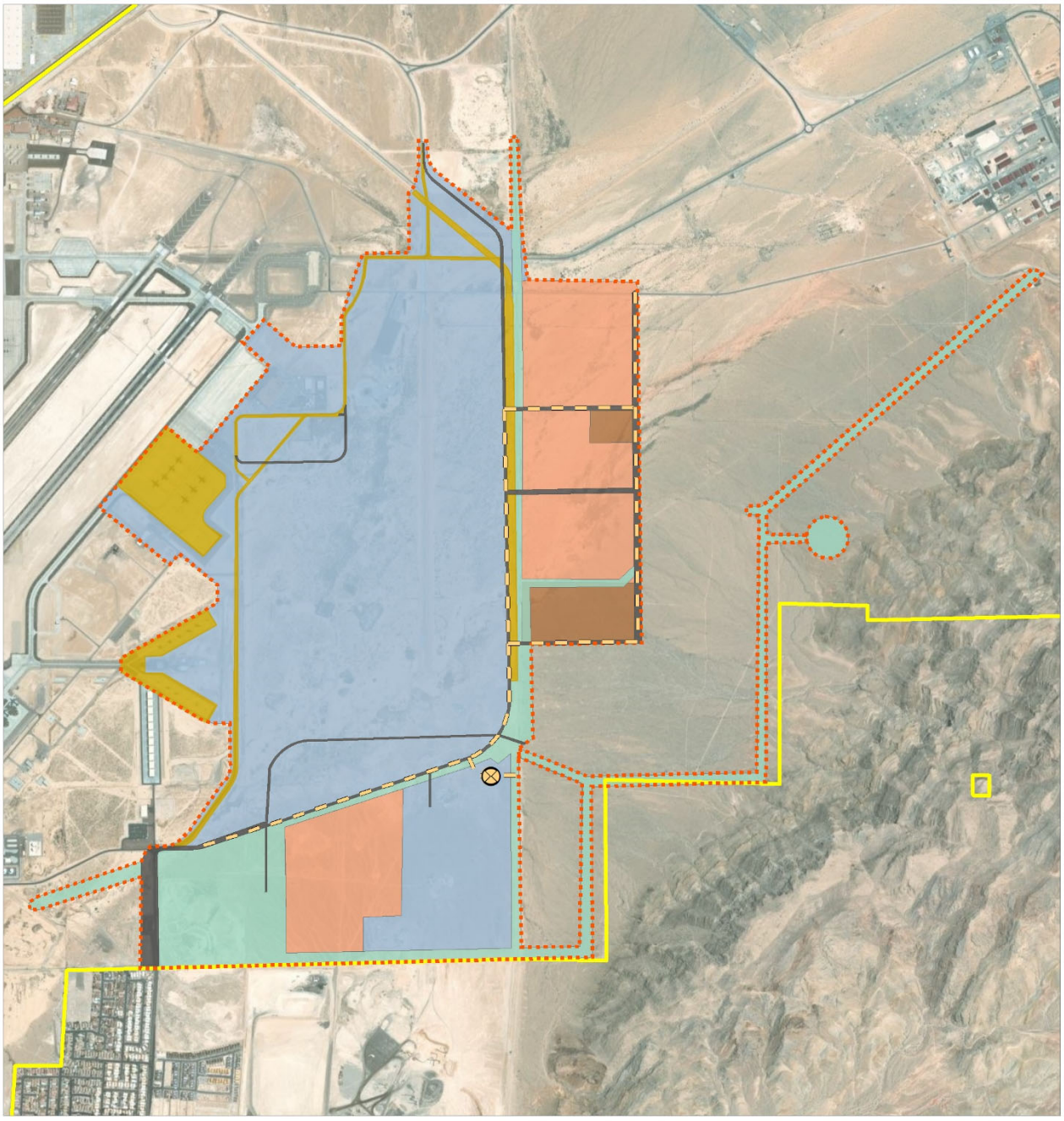


FIGURE 5.6-2
Nellis AFB Proposed Alternative 2 Natural Gas Utilities

- Proposed Gas Meter
- Proposed Natural Gas Line
- Alternative 2
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Medical/Community Services/Community Commercial/Small-scale Retail
- Transporation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

5.7 HYDRANT FUEL SYSTEM

5.7.1 ALTERNATIVE 1 – COMPLETE BUILD-OUT

5.7.1.1 Proposed Hydrant Fuel Demand

Hydrant fuel demand would be based on the number of airframes proposed to be stationed at the Installation to meet future basing scenarios. Base personnel requested approximately 2 million gallons of new hydrant fuel storage for proposed airframes, and all new tanks would be owned by Nellis AFB rather than leased (Nellis AFB, 2023l).

5.7.1.2 Proposed Hydrant Fuel Infrastructure Upgrades

The proposed east-side development area would construct a new hydrant fuel system that would connect to the existing fuel system. There is currently no hydrant fuel infrastructure in the area proposed for development with the exception of an existing hydrant fuel line along the western edge of the east-side development area that serves the existing hydrant fuel system. As shown in **Figure 5.7-1,** under Alternative 1, 11,000 linear feet of 8-inch steel fuel lines and four 500,000-gallon (approximately 12,000-barrel each) tanks would be installed and connected to proposed flight line facilities for airframe use and interconnected with the existing east-side system. Detailed connection points to the hydrant fuel and defueling lines would be determined at the design stage.

5.7.2 ALTERNATIVE 2 – PARTIAL BUILD-OUT

Alternative 2 is the partial build-out of the east-side development area reducing the development footprint compared to Alternative 1 while still meeting mid-term requirements for future growth. No new residential facilities would be constructed, and no outdoor recreation space, open space, and training space would be designated. Utilities, transportation, and infrastructure improvements under Alternative 2 would occur on a smaller scale than under Alternative 1. As shown in **Figure 5.7-2,** hydrant fuel infrastructure under Alternative 2 would remain similar to that as described under Alternative 1.

5.7.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, proposed development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing hydrant fuel infrastructure as its number of personnel and mission continue to grow. If the existing system is properly maintained, there are no present concerns about the future of the Installation's fuel supply or distribution.

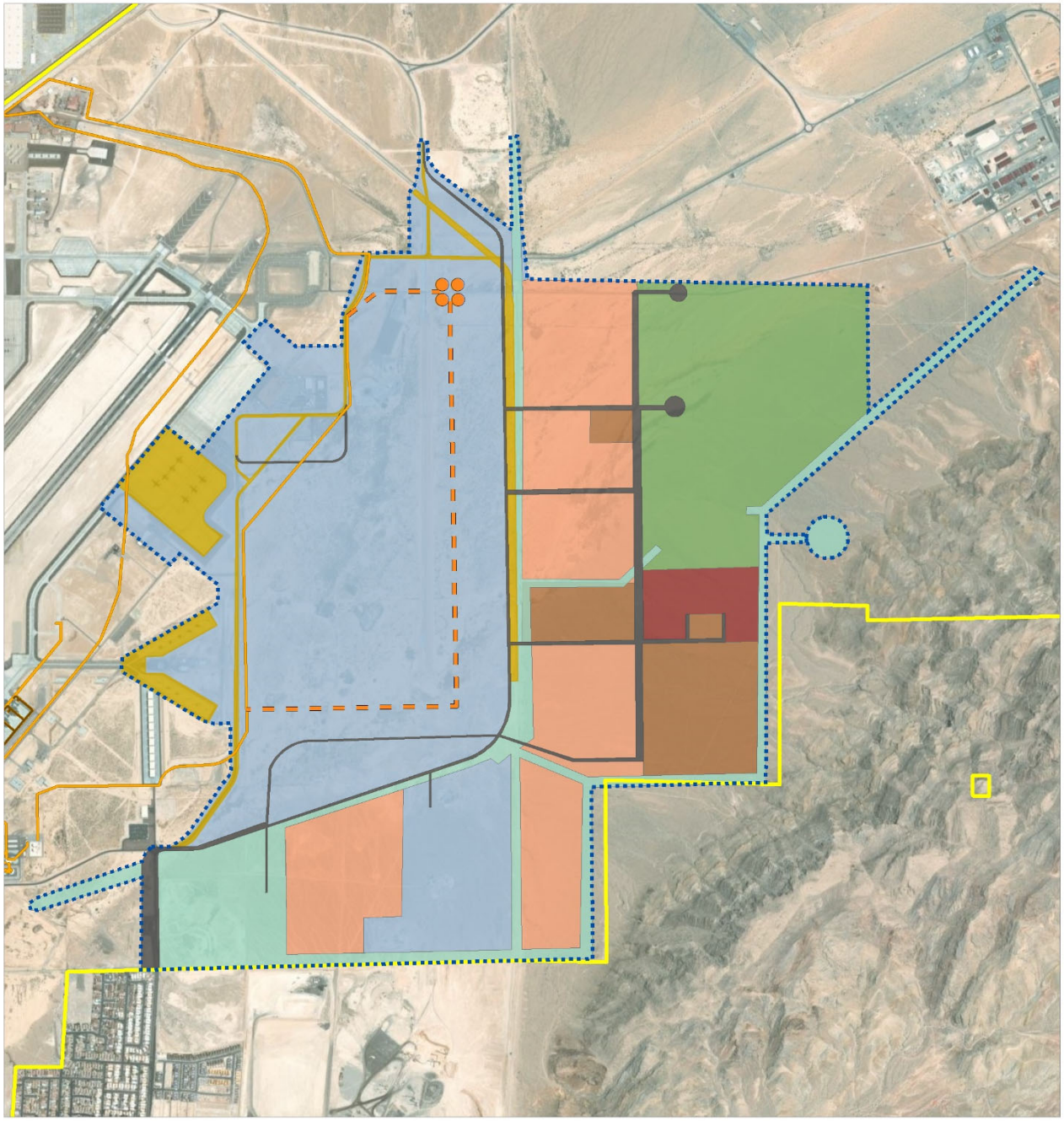


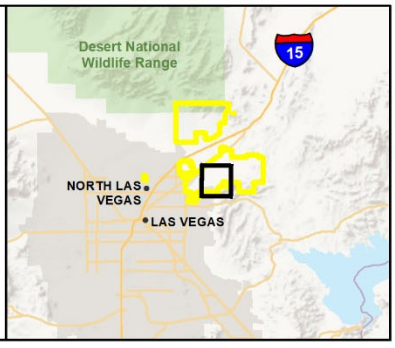
FIGURE 5.7-1
Nellis AFB Proposed Alternative 1 Hydrant Fuel Utilities

- Aviation Fuel Distribution Pipeline
- Defueling Line
- Proposed Hydrant Fuel Tanks
- Proposed Aviation Fuel Line
- Alternative 1
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Lodging/Residential (Accompanied/Unaccompanied)
- Medical/Community Services/Community Commercial/Small-scale Retail
- Outdoor Recreation/ Open Space/ Training Space
- Transportation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



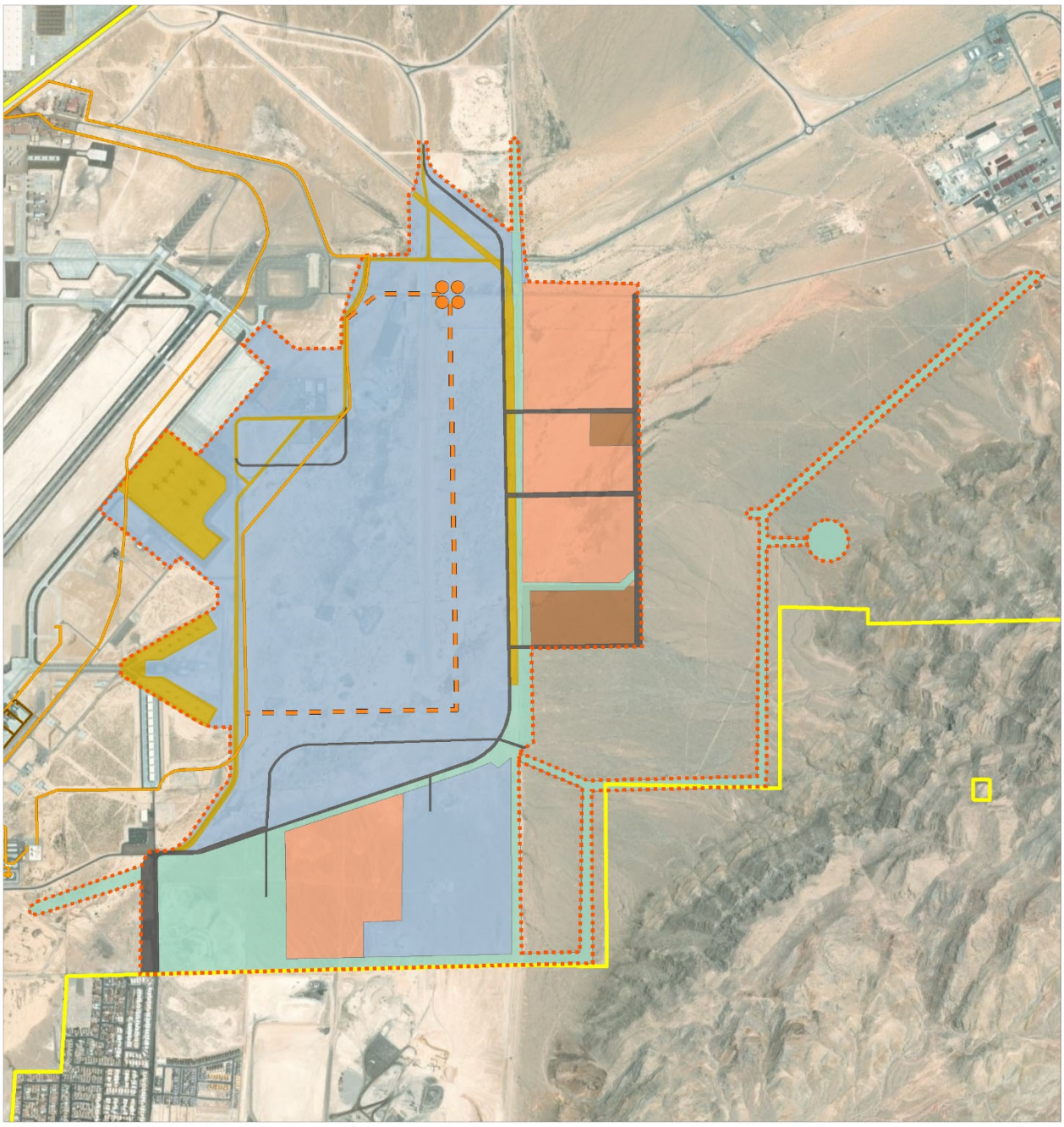


FIGURE 5.7-2
Nellis AFB Proposed Alternative 2 Hydrant Fuel Utilities

- Aviation Fuel Distribution Pipeline
- Defueling Line
- Proposed Hydrant Fuel Tanks
- Proposed Aviation Fuel Line
- Alternative 2
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Medical/Community Services/Community Commercial/Small-scale Retail
- Transporation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

5.8 TRANSPORTATION SYSTEM

5.8.1 ALTERNATIVE 1 – COMPLETE BUILD-OUT

5.8.1.1 Proposed Traffic Projections

The anticipated 10 percent growth (2,500 personnel) in the number of military and civilian personnel who live and work on the Installation over the next decade would remain the same under Alternative 1, Alternative 2, and the No Action Alternative; however, Alternative 1 provides additional lodging/residential facilities while Alternative 2 and the No Action Alternative do not. Under Alternative 1, it is assumed 1,500 additional lodging/residential facilities would be constructed as part of the east-side development area and the remaining would live off the Installation. Under Alternative 2 and the No Action Alternative, it is assumed the 2,500 additional accompanied and unaccompanied military personnel would utilize existing on-Installation living quarters or live off the Installation as no new lodging facilities would be constructed.

The LOS at existing intersections within the Main Base (Area I) with the expected 10 percent growth in 2033 are shown below in Table 5.8-1.

Table 5.8-1 2033 Expected LOS at Intersections within the Main Base (Area I) at Nellis AFB

#	*Intersection*	*A.M. Peak Hour*	*P.M. Peak Hour*
1	Washington Boulevard & Swaab Boulevard	B	E
2	Washington Boulevard & Devlin Drive	B	C
3	Washington Boulevard & Rickenbacker Road	B	C
4	Rickenbacker Road & Duffer Drive	B	C
5	Kinley Avenue & Duffer Drive	A	A
6	Kinley Avenue &Tyndall Avenue	A	A
7	Tyndall Avenue & Duffer Drive	A	A
8	Tyndall Avenue & Griffis Avenue	A	A
9	Ellsworth Avenue & Devlin Road	A	A
10	Ellsworth Avenue & Fitzgerald Boulevard	C	B
11	Ellsworth Avenue & Beale Avenue	E	E
12	Swaab Boulevard & Duffer Drive	A	A
13	Washington Boulevard & Fitzgerald Boulevard	C	F
14	O'Bannon Road & Minot Drive	A	A

Legend: A.M. = morning; P.M. = evening; LOS = Level of Service
Source: Nellis AFB, 2023h.

At several locations, the existing infrastructure is insufficient to handle the proposed growth. The TMP identified the following locations for intersection improvements:

- Construct a roundabout at Washington Boulevard and Swabb Boulevard
- Construct a roundabout at Washington Boulevard and Rickenbacker Road
- Construct a roundabout at Washington Boulevard and Devlin Drive

- Construct a roundabout at Washington Boulevard and Fitzerald Boulevard

With the exception of the Ellsworth Avenue and Beale Avenue intersection, which was not addressed in the TMP, these recommended improvements increase the LOS to a C or better to accommodate the proposed growth.

5.8.1.2 Proposed Transportation Infrastructure

5.8.1.2.1 Gate Access

Since the overall volume of additional personnel is consistent across all alternatives, the internal traffic growth would also be similar across all alternatives. However, when personnel are housed off the Installation, the volume of the gate entries would increase as it is assumed personnel would access the Installation twice a day during the weekday. Up to 75 percent of the additional proposed growth would live off the Installation increasing the total gate volume across Nellis AFB by approximately 8 percent.

Hollywood Gate would be the primary access gate for those personnel living on or working within the proposed east-side development area. Hollywood Gate, currently closed, would be re-opened and reconstructed to current AT/FP standards and include construction of two lanes to accommodate AM (morning) and PM peak hour traffic as identified in **Table 5.8-2**. It is assumed some drivers who currently access the Installation through other gates would relocate to Hollywood Gate, as shown in **Table 5.8-2**.

Table 5.8-2 shows the expected vehicle counts at each gate under Alternative 1 to include an 8 percent growth rate and diversions from other gates at Nellis AFB. Calculations detailing the assumptions for this proposed design can be found in **Appendix B.**

Table 5.8-2 Alternative 1 Proposed Gate Counts at Nellis AFB at an 8 Percent Growth Rate

Gate	*Diversion to Hollywood Gate*	*A.M. Peak Hour*		*P.M. Peak Hour*	
		Entry	*Exit*	*Entry*	*Exit*
Area II Gate	5%	642	27	60	319
Beale Gate	25%	590	152	213	661
Main Gate	10%	708	232	442	793
Simons Gate	25%	323	42	36	279
Hollywood Gate	–	415	90	133	415
Total (Includes 8% Growth)		**2,678**	**542**	**884**	**2,467**

Legend: A.M. = morning; P.M. = evening.
Source: Stantec 2024.

5.8.1.2.2 Roadways

The proposed east-side development area would construct a completely new transportation system to support the east-side development area. It is expected that the majority of the roadways would

be constructed with a closed drainage system and include appropriate traffic calming based on the proposed design speed.

As shown in **Figure 5.8-1**, new roadways would be constructed within the proposed east-side development area. These roadways would include:

- The primary throughway for the east-side development area would be the proposed extension of Ellsworth Avenue from its current end at O'Bannon Road to Hollywood Boulevard. The roadway would be a 2-lane, paved roadway with open drainage that would provide access to the Man Base (Area I). The proposed Ellsworth Avenue would provide access to Area II via O'Bannon Road and Munitions Road.
- East-West feeder roads connected to the extended Ellsworth Avenue would be constructed to provide access to the proposed facilities under each functional area.

This infrastructure and utility assessment is a high-level planning assessment of the proposed east-side development area related to the functional areas as described in Section 3.2. As such, exact building dimensions, including location, quantity, square feet, and capacity of the proposed facilities are unknown; therefore, roadway types, locations, and capacities for the proposed development would be assessed during the design stage.

5.8.2 ALTERNATIVE 2 – PARTIAL BUILD-OUT

Alternative 2 is the partial build-out of the east-side development area reducing the development footprint compared to Alternative 1 while still meeting mid-term requirements for future growth (**Figure 5.8-2**). No new residential facilities would be constructed, and no outdoor recreation space, open space, and training space would be designated. Transportation improvements, including roadways, under Alternative 2 would be similar to and occur on a smaller scale than under Alternative 1.

5.8.2.1.1 Gate Access

Under Alternative 2, all 2,500 additional personnel would be assumed to live off the Installation as no new lodging facilities would be constructed; therefore, total gate volume would increase by 10 percent. It is assumed up to 10 percent of the trips would divert to Hollywood Gate with construction of two lanes to accommodate the proposed growth.

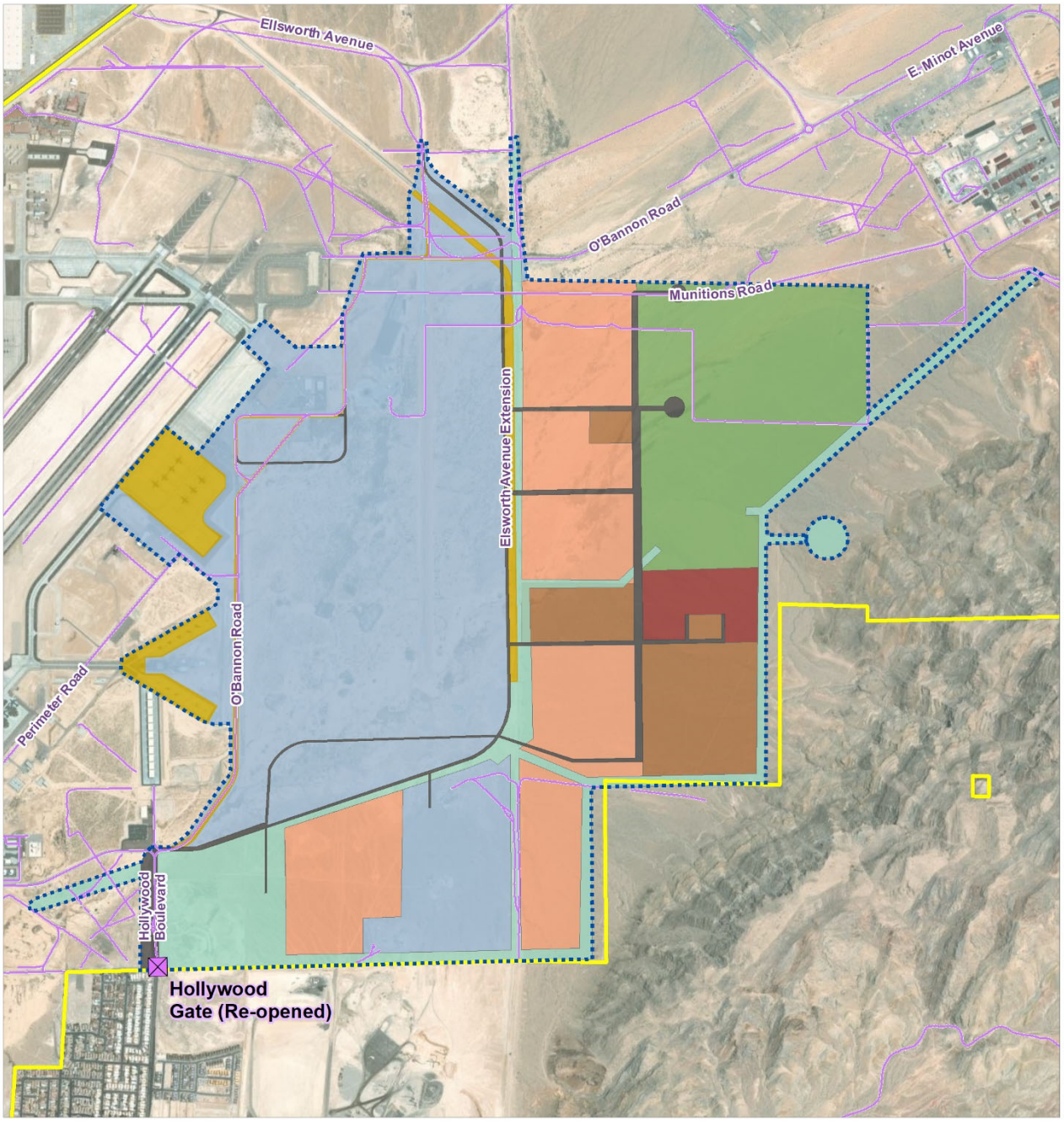
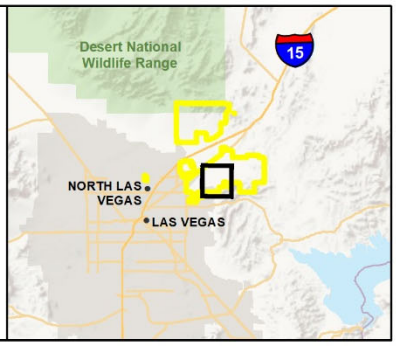


FIGURE 5.8-1
Nellis AFB Proposed Alternative 1 Transportation Network

Entry Gate
Base Road
Alternative 1
Installation Boundary
Administrative/Small-scale Administrative
Airfield Operations/Industrial/Light Industrial
Existing Pavements
Lodging/Residential (Accompanied/Unaccompanied)
Medical/Community Services/Community Commercial/Small-scale Retail
Outdoor Recreation/Open Space/Training Space
Transportation (Proposed)
Utilities/Infrastructure

N
0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



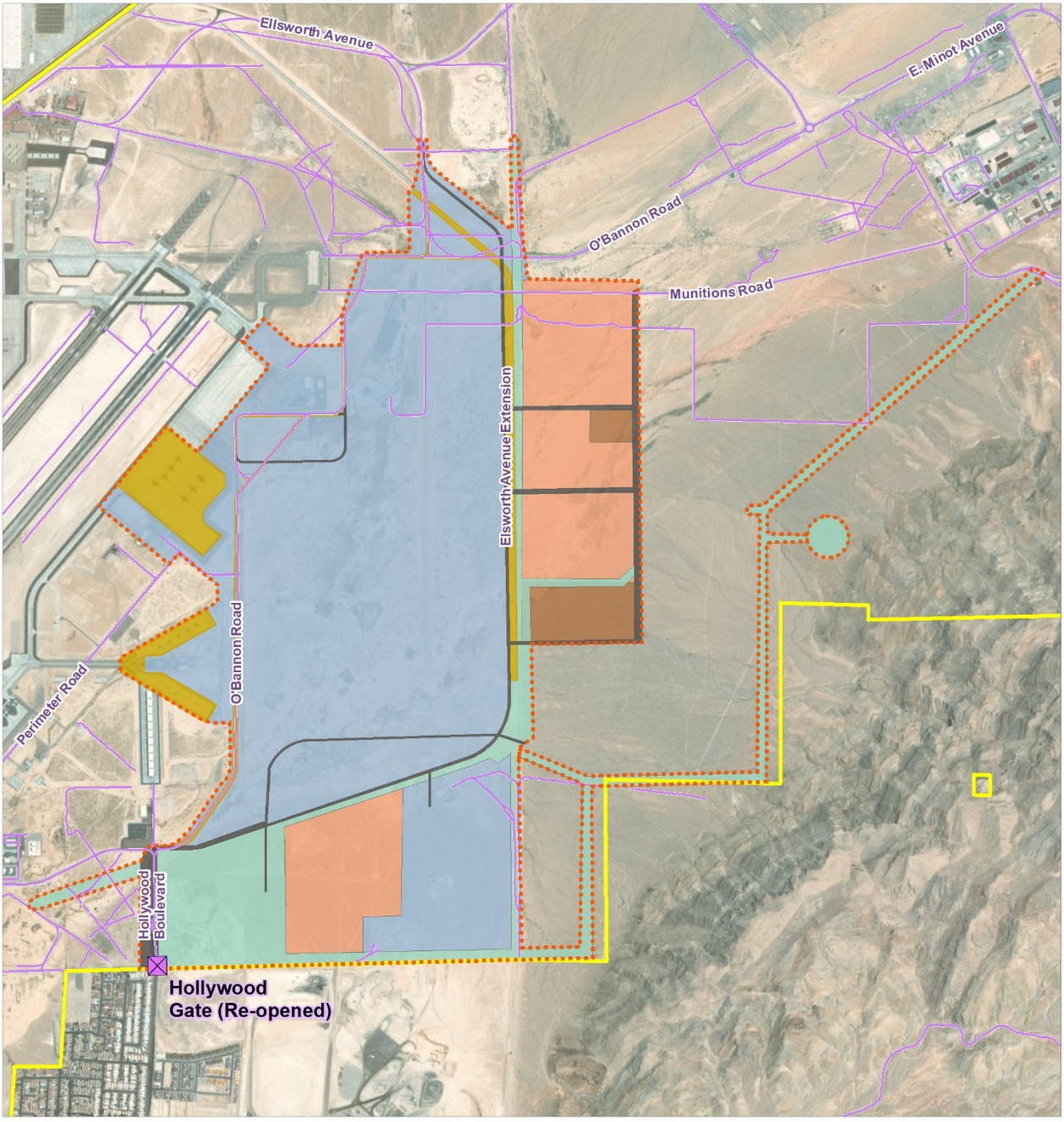


FIGURE 5.8-2
Nellis AFB Proposed Alternative 2 Transportation Network

- Entry Gate
- Base Road
- Alternative 2
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Medical/Community Services/Community Commercial/Small-scale Retail
- Transporation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

Alternative 2 would have an increase in traffic at AM and PM peak hours when compared to Alternative 1. **Table 5.8-3** shows the expected vehicle counts at each gate under Alternative 2. Calculations detailing the assumptions for this proposed design can be found in **Appendix B.**

Table 5.8-3 Alternative 2 Expected Gate Counts at Nellis AFB at a 10 Percent Growth Rate

Gate	*Diversion to Hollywood Gate*	*AM Peak Hour*		*PM Peak Hour*	
		Entry	*Exit*	*Entry*	*Exit*
Area II Gate	5%	654	28	61	324
Beale Gate	25%	601	155	217	673
Main Gate	10%	721	236	450	807
Simons Gate	25%	329	43	37	284
Hollywood Gate	---	422	91	135	425
Total (Includes 10% Growth)		**2,727**	**553**	**900**	**2,513**

Source: Stantec 2023.

5.8.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, proposed development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing transportation infrastructure systems as its number of personnel and mission continue to grow. Without development of the east side of Nellis AFB, existing transportation infrastructure would be insufficient to meet Air Force and DoD future mission requirements.

The volume of traffic at the gate entrances would continue to increase in relation to the 10 percent increase in personnel and the existing four gates would continue to be inadequate to support anticipated growth (**Table 5.8-4**). Calculations detailing the assumptions for this proposed design can be found in **Appendix B.**

Table 5.8-4 No Action Alternative Expected Gate Counts at Nellis AFB at a 10 Percent Growth Rate

Gate	*Diversion to Hollywood Gate*	*AM Peak Hour*		*PM Peak Hour*	
		Entry	*Exit*	*Entry*	*Exit*
Area II Gate	0%	688	29	64	341
Beale Gate	0%	801	206	289	897
Main Gate	0%	801	262	499	897
Simons Gate	0%	437	56	48	378
Hollywood Gate	---	0	0	0	0
Total (Includes 10% Growth)		**2,727**	**553**	**900**	**2,513**

Source: Stantec 2023.

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6.0 COST ESTIMATE

In accordance with AACE International Recommended Practice 56R-08, *Cost Estimate Classification System, as Applied in Engineering, Procurement, and Construction for the Building and General Construction Industries*, this process is a Class 4/5 estimate. Cost estimating methodology was prepared based on limited information as this is a high-level planning analysis and subsequently the results have wide accuracy ranges. Stochastic estimating methods such as parametric models, and assembly driven models, were used for this analysis including the use of PACES software with MII support.

The project estimate is generated using PACES version 1.5 and MII version 4.4.3. PACES software is a cost engineering tool to help plan and budget facility and infrastructure construction and renovation costs. PACES is an integrated PC-based system that prepares parametric cost estimates for new facility construction, renovation, and life cycle cost. PACES uses pre-engineered model parameters and construction criteria to accurately predict construction costs with limited design information. PACES pre-engineered models are tailored by adding parameters to reflect project-specific conditions and requirements. The tailored design is then translated into specific quantities of work and the quantities of work are priced using current price data.

MII is the second generation of the Micro-Computer Aided Cost Estimating System. It is a detailed cost estimating software application developed in conjunction with Project Time & Cost, LLC. MII provides an integrated cost estimating system (software and databases) that meets the U.S. Army Corps of Engineers (USACE) requirements for preparing cost estimates. MII is used to validate PACES assembly cost.

Takeoffs were developed based on the project's proposed Alternative 1 and 2 site plans as shown in the Interim Draft Infrastructure and Utility Assessment. PACES pre-engineered models were then customized resulting in project specific assemblies. These assembly costs were validated using MII detailed task cost line items based on Pareto's principle, 80/20 rule, 80 percent of the cost is determined by 20 percent of the line items. Assemblies are organized in Uniformat II, defined by ASTM E1557-09 (2015), *Standard Classification for Building Elements and Related Sitework*, with line-item tasks organized using Master Format source tags that includes labor, material, and equipment cost. Note, sitework items such as site utilities, roads, and sidewalks are included in Uniformat II Group G. The estimates are based on the best available information regarding the anticipated scope of the project as determined by Nellis AFB.

The quantity survey for this project is as detailed as possible and indicative of the level of design and documentation available and does not indicate a higher degree of accuracy than is possible. Where quantities are not available, assumptions have been made based on the historical information from a similar type or other recently estimated project.

The pricing used reflects the probable construction costs for the scheduled time of the project. This estimate assumes a competitive bid situation and is based on fair market value and is not a prediction of the anticipated low bid. This estimate assumes no control over the cost of labor and materials, the General Contractor's, or any subcontractor's method of determining price or competitive bidding and market conditions. An Area Cost Factor, 1.16, was selected for Nellis AFB, Nevada from UFC 3-701-01, *DoD Facilities Pricing Guide* dated 17 March 2022, Table 4-1, Continental U.S.

An escalation rate was derived on USACE Tri-Service Automated Cost Engineering Systems' team latest "Cost Book" last released January 2022 and an assumed construction mid-point of December 2025. Using DoD's Building Cost Index dated February 2023 and published in UFC 3-701-01, *DoD Facilities Pricing Guide*, this resulted in a derived escalation factor of 25.6 percent.

Direct project markups include:

- Labor Productivity @ 85 percent due to working in a secured area
- Escalation @ 25.6 percent
- Design Contingency @ 20 percent
- Area Cost Factor @ 1.16 percent

Markups for job office overhead, home office overhead, and bond were established based on overall project risk for each discipline. Contractor Markups used are:

- Prime Job Office Overhead @ 10 percent
- Primes OH on Sub-contractor @ 5 percent
- Prime Home Office Overhead @ 10 percent
- Prime Bond @ 3 percent
- Prime Profit @ 8 percent

These markups are based on recently awarded projects. Profit was calculated using MII's Weighted Guidelines profit calculator, resulting in a profit of 8 percent. The estimate also includes a 20 percent Design Contingency. The resulting costs are summarized in **Table 6.0-1**. Detailed costs are provided in PACES Assembly Detail reports included in **Appendix C**.

Table 6.0-1 Infrastructure and Utility Cost Estimates for the Proposed East-Side Development Area

System	*Description*	*Cost ($000)*
Potable Water	Alternative 1 – Complete Build-Out	$22,819
	Alternative 2 – Partial Build-Out	$22,471
Wastewater	Alternative 1 – Complete Build-Out	$12,277
	Alternative 2 – Partial Build-Out	$12,277
Stormwater Management	Alternative 1 – Complete Build-Out	$118,822
	Alternative 2 – Partial Build-Out	$106,735
Electrical	Alternative 1 – Complete Build-Out	$77,650
	Alternative 2 – Partial Build-Out	$67,204
Telecommunications	Alternative 1 – Complete Build-Out	$12,360
	Alternative 2 – Partial Build-Out	$9,763
Natural Gas	Alternative 1 – Complete Build-Out	$932
	Alternative 2 – Partial Build-Out	$932
Hydrant Fuel	Alternative 1 – Complete Build-Out	$19,721
	Alternative 2 – Partial Build-Out	$19,721
Transportation	Alternative 1 – Complete Build-Out	$12,311
	Alternative 2 – Partial Build-Out	$7,859
	Total	**$523,854**

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Legend: 99 CES = 99th Civil Engineer Squadron; 99 CES/CENP = 99th Civil Engineer Squadron/Portfolio Optimization; 99 CES/CENPE = 99th Civil Engineer Squadron/Energy Planning;99 CES/CENMP = 99th Civil Engineer Squadron/Project Execution;99 CS = 99th Communications Squadron; 99 LRS = 99th Logistics Readiness Squadron; AFB = Air Force Base; CEOFP = Power Production Section; NEPA = National Environmental Policy Act; PM = Project Manager; POL = Petroleum, Oil, and Lubricant; RP = Real Property; RPAO = Real Property Accountability Officer; USAF = United States Air Force.

8.2 ORGANIZATIONS

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Legend: CCWRD = Clark County Water Reclamation District; LVVWD = Las Vegas Valley Water District; NV = Nevada.

9.0 LIST OF PREPARERS AND CONTRIBUTORS

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Appendix A
Meeting Minutes

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Sign In Sheet

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Hydrant Fuels

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Sign In Sheet

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Southwest GAS 8/17 1430

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Sign In Sheet

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

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Sign In Sheet

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Clark County Water Reclamation District

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Sign In Sheet

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

OutBrief

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Sign In Sheet

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

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Sign In Sheet

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

1430 - 1530 TUES 8/15 ELECTRICAL

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Sign In Sheet

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

THURS 8/17 COMMUNICATIONS
0930 - 1100

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Sign In Sheet

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

WED 1030 - 1130 8/16
NVENERGY

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Meeting Minutes

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Meeting Details – Clark County Water Reclamation District

Date: 8/16/2023

Time: 0900 – 1000

Attendees:

Christopher Arnold, Civil Engineer, Stantec GS, Christopher.Arnold@stantecgs.com
Tod Oppenborn, NEPA, 99CES/CENPP, tod.oppenborn@us.af.mil
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Beth McDuffie, RPAO, 99CES

Agenda:

- **Introduction**
  - Team introductions.
  - Review of preliminary action.
- **Main Discussion**
  - Estimated 200,000-300,000 GPD Sewage Generation.
    - 75 – 125 GPD/Cap, 2500 Personnel.
  - Connection point is preliminarily planned to remain the same.
  - Does the road interceptor have capacity for this much approximate sewage?
  - Does the treatment plant have the capacity for this much approximate load?
  - What would the base have to do to obtain the sewage capacity?

Proposed Action and Functional Areas

- The Air Force is considering expanding its on base utilities and infrastructure to the east side of the flightline and is preparing an Environmental Impact Statement for this action. The proposed actions are still a work in progress and are awaiting review and approval. They have not been published or officially been made public. These discussions concern the baseline status of existing base wide utilities, an understanding of available utility capacities, and the opportunities or impediments to developing the needed utility infrastructure.
- Functional areas include:
  - Airfield Operations/Industrial/Light Industrial.
  - Administrative.
  - Lodging/Residential.
  - Medical/Community Services/Commercial/ Small Scale Retail.
  - Transportation.

- Utilities/Infrastructure.

Existing Sanitary Sewer System

- Presently, the western side of the flightline is served by multiple lift stations and gravity mains discharging into the Nellis Road public collector.
- There are existing sewers and pump stations south of Hollywood Gate.

Proposed Action Potential Infrastructure Capacity Requirements

- Preliminary estimated Sewage Generation for complete build out of Alternative 1 is 200,000 - 300,000 gallons per day, based on 75-150 gpd/cap and 2,500 personnel.
- Plant Discussion:
  - Per CCWRD, wastewater treatment plant is currently treating approximately 106 MGD with permitted capacity to treat approximately 180 MGD.
  - CCWRD did not foresee any capacity issues at the plant as a result of the proposed development.
- Proposed options for connection points:
  - Existing connection point from base.
    - It was discussed and it could be utilized, further analysis is required for possible use of the existing system.
    - Proposed project on Nellis Rd to improve capacity in that area.
  - New connection point from east side.
    - Existing sewer and lift station near Hollywood Gate.
    - Lift station proposed to be relocated within the general vicinity of Hollywood.
    - Preferred at this time by CCWRD, as the Hollywood Gate area is in the Sloan Basin, which has generally more capacity than the Nellis Rd interceptors.
  - Septic Systems.
    - Not an option, CCWRD would like any remaining septic systems connected to the sanitary sewer system.
- CCWRD state that they would look at their models for Nellis Blvd and the Sloan Basin for any existing or future capacity concerns.
- Once the proposed action moves into a planning phase, the first step would be to develop an estimated load based on a more complete proposed design. Connection permits would be applied for by the base at that time.

Meeting Minutes

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Meeting Details – Communications

Date: 8/17/2023

Time: 0930 – 1100

Attendees:

David Vest, Electrical Engineer, Stantec GS, david.vest@stantecgs.com
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Douglas Davis, Planning Engineer, Lumen, douglas.davis1@lumen.com

Agenda:

1. Present DOPPA Proposed Action and Functional Areas.
2. Discussion of communications utility service to base.
3. Discussion of Communications infrastructure architecture requirements for the proposed action.

Proposed Action and Functional Areas

- The Air Force is considering expanding its on base utilities and infrastructure to the east side of the flightline and is preparing an Environmental Impact Statement for this action. The proposed actions are still a work in progress and are awaiting review and approval. They have not been published or officially been made public. These discussions concern the baseline status of existing base wide utilities, an understanding of available utility capacities, and the opportunities or impediments to developing the needed utility infrastructure.
- Functional areas include:
    - Airfield Operations/Industrial/Light Industrial.
    - Administrative.
    - Lodging/Residential.
    - Medical/Community Services/Commercial/ Small Scale Retail.
    - Transportation.
    - Utilities/Infrastructure.

Existing Communication Distribution System

- Existing communications infrastructure has limited growth capacity. New duct bank systems and communications hubs will be required for expansion into the proposed action area.
- Lumen fiber network enters facility in 3 locations, Building 6, 200 and 1740.
- All new distribution systems will be fiber optic. Existing Copper backbone communications networks have been abandoned and are no longer in use. No new copper distribution systems will be installed.

- There are current plans to construct a new Information Transfer Building (ITB) near the tower on east side of flightline (144 strand OSP FO).
- Verizon is planning installation of new cell tower on base.

Proposed Action Potential Infrastructure Capacity Requirements

- Reference Nellis-Creech IFS Appendix G – Communication Installation Standards.
- New OSP duct bank and manhole/handhole infrastructure to extend from west side, around south side of flightline to new east side ITB facility in proposed action area. Include (3) 288 strand OSP FO cable. The new ITB to also be connected via duct bank to ITB being installed near flightline tower.
- Distribution system duct bank infrastructure to be 4 or 6 way 4" ducts with (3) 3 cell x 3" MaxCell fabric innerducts. Handholes to be used for pull points. Manholes to be used for building distribution.
- Service to each building to include 12 strand each OS2 and OM4 FO cable with continuous home run. No splicing.

Follow Up

- Doug Davis, Lumen, to provide additional information on incoming service entrance systems and base wide distribution systems.
- Dave Vest to coordinate with Dave Steimel on potential distribution system layout in proposed action area.

Meeting Minutes

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Meeting Details – Base Electrical

Date: 8/15/2023

Time: 1430 - 1530

Attendees:

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Jeffrey Blazi, Utilities and Energy Management, 99CES/CENPE, jeffery.blazi@us.af.mil
Tod Oppenborn, NEPA, 99CES/CENPP, tod.oppenborn@us.af.mil

Agenda:

1. Present DOPAA Proposed Action and Functional Areas.
2. Discussion of existing base wide electrical distribution system.
3. Load demand and potential electrical distribution system design for proposed action
4. Expansion of distributed energy resources and renewables.

Proposed Action and Functional Areas

- The Air Force is considering expanding its on base utilities and infrastructure to the east side of the flightline and is preparing an Environmental Impact Statement for this action. The proposed actions are still a work in progress and are awaiting review and approval. They have not been published or officially been made public. These discussions concern the baseline status of existing base wide utilities, an understanding of available utility capacities, and the opportunities or impediments to developing the needed utility infrastructure.
- Functional areas include:
    - Airfield Operations/Industrial/Light Industrial.
    - Administrative.
    - Lodging/Residential.
    - Medical/Community Services/Commercial/ Small scale Retail.
    - Transportation.
    - Utilities/Infrastructure.

Existing Electrical Distribution System

- Base owned Northgate Substation – feed from single 69kV NV Energy feeder originating at NVE Nellis substation. Northgate substation includes two substation transformers (40MVA and 33MVA) providing 12.47 KV to a doubled ended switchgear for distribution throughout base via 9 primary overhead and underground circuits.
- 22 MVA NV Energy owned Clinton Substation, located south of the golf course and PV array, near E Cary Ave, provides interconnection to existing base circuits 1 and 2.
- NV energy owned Carey Substation, located at intersection of E Carey Ave and N Nellis Blvd, provides 11 MVA interconnection to existing base circuit 9.

- Other than circuit 6, all existing circuits have some interconnect ability with other circuits to allow partial redundancy capabilities.
- Renewable PV Array 1 (north) – 13.5 MW operated by Brookfield Renewables via Solar Star NAFB LLC. Connected to circuits 5 & 6. Metered and billed separately.
- Renewable PV Array 2 (south) – 15MW operated by NVE. Connected to circuit #1 & #2. Combined in NVE standard monthly bill.
- PV arrays provide power required to meet daytime demand requirements of the base.
- Typical distribution system voltage drop = 1%.
- Existing capacity in distribution system = approx. 600A, 12.47 kV = 12 MVA.
- NVE metering based on Time of Use Schedule:
    - Summer On-peak = 1pm – 7pm.
    - Summer Mid-Peak = 10am – 1pm and 7pm to 10pm.
    - Summer off-peak = 10pm to 10am.
    - On-Peak will change to 1pm – 9pm in 2024.
- Current and potential projects to upgrade distribution system:
    - CKT 1 – upgrade undersized sections of circuit to increase reliability.
    - CKT 1 – Extend along east side of flightline and interconnect with CKT 4.
    - CKT 4 & 5 Upgrade undersized sections of circuit to increase reliability.
    - Relocate portions of CKT 1 & 4 around the outside of the flightline.
    - Upgrade 600A feeders to 750 MCM.
    - Upgrade 600A feeders to 900A.
    - Provide a second service to F35 Hangers to accommodate increased demand requirements of latest equipment.

Proposed Action Potential Infrastructure Improvements

- Preliminary estimated demand load for complete build out of Alternative 1 is 22MVA.
- Provide new substation for east side. Locate in SE corner of base property.
- New substation should replicate the existing Northgate Substation. Single 69 kV feed from NVE, (2) 40MVA substation transformers to convert to 12.47 kV distribution voltage. New double ended switchgear. Four new redundant primary circuits extend from each side of switchgear and interconnected on a loop system.
- On base electrical distribution system to follow requirements of Nellis-Creech IFS Appendix G-Electrical Standard.
- New primary circuits to be 600 A, 750 MCM, 15kV EPR MV105, 133% Insulated CU feeders with 1/3 concentric neutral.
- All new distribution system to be underground in 6” conduit ductbank system.
- All primary feeder splices and distribution switches to be in 600 Amp, two sided, oil insulated type with 200 Amp Vacuum Fault Interrupting (VFI) laterals, deadfront, padmount switchgear (Cooper Power Series).
- Provide Counterpoise ground ring around all new switches and manholes.
- The new substation could include circuits to interconnect with existing Northgate circuits for redundancy and system reliability.

- Labeling for new circuits should start at 11, 12 etc. to not be confused with Northgate circuits.

Distributed Energy Resources and Renewables.

- Possible option for installation of Microgrid PV array with utility scaled battery system. Battery could be used shave peak demand at the end of the day when solar production has ended but the On-Peak time of use tariff is still in effect.

Meeting Minutes

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Meeting Details – Hydrant Fuels

Date: 8/16/2023

Time: 1330 – 1430

Attendees:

Christopher Arnold, Civil Engineer, Stantec GS, Christopher.Arnold@stantecgs.com
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Manuel Huesca, SSgt, 99LRS, Manuel.Huesca@us.af.mil

Agenda:

- **Introduction**
  - Team Introductions.
  - Review of preliminary action.
- **Main Discussion**
  - Discussion of proposed hydrant fuel needs for the east side development.

Proposed Action and Functional Areas

- The Air Force is considering expanding its on base utilities and infrastructure to the east side of the flightline and is preparing an Environmental Impact Statement for this action. The proposed actions are still a work in progress and are awaiting review and approval. They have not been published or officially been made public. These discussions concern the baseline status of existing base wide utilities, an understanding of available utility capacities, and the opportunities or impediments to developing the needed utility infrastructure.
- Functional areas include:
  - Airfield Operations/Industrial/Light Industrial.
  - Administrative.
  - Lodging/Residential.
  - Medical/Community Services/Commercial/ Small scale Retail.
  - Transportation.
  - Utilities/Infrastructure.

Existing Hydrant Fuel System

- Presently, the western side of the flightline is served by a hydrant fuel system from west of Nellis Blvd.
- Presently, there is 1 million gallons of tankage on the existing facility west of Nellis Blvd.
- There are no present concerns about the availability of fuel.

Proposed Action Potential Infrastructure Capacity Requirements

- The preliminary proposed layout discussed adds around 100 planes to the base.
- Base personnel requested consideration in regards to the jet fuel hydrant fuel system:
    - Interconnect the future fuel system with the existing fuel system.
    - Add at least two (2) one million gallon fuel tanks for the increase in aircraft demand.
    - All new lines and tanks should be owned by Nellis AFB. Currently, some tanks are owned by Kinder Morgan and the base would like full control of the systems.
    - Trucking jet fuel is not an option.
    - Tank rehabilitation on the east side will likely be required.
- Base personnel requested consideration in regards to the AGE fuel:
    - Gas/Diesel station strongly preferred east of flightline to relieve west side station.

Meeting Minutes

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Meeting Details – Natural Gas

Date: 8/17/2023

Time: 1430 – 1530

Attendees:

Christopher Arnold, Civil Engineer, Stantec GS, Christopher.Arnold@stantecgs.com
Tod Oppenborn, NEPA, 99CES/CENPP, tod.oppenborn@us.af.mil
Jeff Blazi, Utility and Energy Manager, 99CES/CENPP, jeffery.blazi@us.af.mil
Robyn Zier, Account Advisor, Southwest Gas, bsmatingground@gmail.com

Agenda:

- **Introduction**
  - Team Introductions.
  - Review of preliminary action.
- **Main Discussion**
  - Discussion of proposed natural gas needs for the east side development.
  - Discussion with Southwest Gas on availability.

Proposed Action and Functional Areas

- The Air Force is considering expanding its on-base utilities and infrastructure to the east side of the flightline and is preparing an Environmental Impact Statement for this action. The proposed actions are still a work in progress and are awaiting review and approval. They have not been published or officially been made public. These discussions concern the baseline status of existing base wide utilities, an understanding of available utility capacities, and the opportunities or impediments to developing the needed utility infrastructure.
- Functional areas include:
  - Airfield Operations/Industrial/Light Industrial.
  - Administrative.
  - Lodging/Residential.
  - Medical/Community Services/Commercial/ Small scale Retail.
  - Transportation.
  - Utilities/Infrastructure.

Existing Natural Gas System

- Presently, the western side of the flightline is served by natural gas from Nellis Blvd.
- Presently, there are no major concerns about the availability of natural gas for the existing sites.

Proposed Action Potential Infrastructure Capacity Requirements

- A preliminary layout of the site proposes approximately 4,000,000 sf of buildings for the full buildout (Alternative 1) condition.
- Heating for the proposed east side is estimated at 28 btu/h/sf or 112,000,000 btu/h peak heating required.
- Hot water, for the proposed east side is estimated at 20 btu/h/sf or 80,000,000 btu/h peak hot water required.
- Total peak demand is approximately 192 million btu/h.
- Based on the current site layout, a new connection to the Southwest Gas main through the Hollywood Gate area is most likely due to ease of connection. The locations of the gas lines within the remainder of the base are not conducive to a cost-effective connection.
- Metering would likely be by a new master meter for the east side alone. Submetering would be base responsibility.
- Utility personnel had no concerns about the estimated demands or availability of connection.

Meeting Minutes

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Meeting Details – NV Energy

Date: 8/16/2023

Time: 1030 – 1130

Attendees:

David Vest, Electrical Engineer, Stantec GS, david.vest@stantecgs.com
Louis Weger, Base Elec Engineer, 99CES/CENMP, louis.weger@us.af.mil
Johnny Camarena, Base Elec Engineer, 99CES/CENMP, johnny.camarena@us.af.mil
Salar Riazati, Base Elec Engineer, 99CES/CENMP, salar.riazati.1@us.af.mil
Jeffrey Blazi, Utilities and Energy Management, 99CES/CENPE, jeffery.blazi@us.af.mil
Tod Oppenborn, NEPA, 99CES/CENPP, tod.oppenborn@us.af.mil
Joeseph Dirosario, Lead programmer, 99CES, joseph.dirosario.3@us.af.mil
Hector Gonzalez. NV Energy, hector.gonzalez@nvenergy.com

Agenda:

1. Present DOPPA Proposed Action and Functional Areas.
2. Discussion of electrical utility service to base.
3. Load demand and review of electrical utility capacity requirements for the proposed action.

Proposed Action and Functional Areas

- The Air Force is considering expanding its on base utilities and infrastructure to the east side of the flightline and is preparing an Environmental Impact Statement for this action. The proposed actions are still a work in progress and are awaiting review and approval. They have not been published or officially been made public. These discussions concern the baseline status of existing base wide utilities, an understanding of available utility capacities, and the opportunities or impediments to developing the needed utility infrastructure.
- Functional areas include:
    - Airfield Operations/Industrial/Light Industrial.
    - Administrative.
    - Lodging/Residential.
    - Medical/Community Services/Commercial/ Small scale Retail.
    - Transportation.
    - Utilities/Infrastructure.

Existing Electrical Distribution System

- Base owned Northgate Substation – feed from single 69kV NV Energy feeder originating at NVE Nellis substation.
- 22 MVA NV Energy owned Clinton Substation, located south of the golf course and PV array, near E Cary Ave, provides redundant interconnection to existing base circuits 1 and 2. The substation was supplied as trade in kind to allow NV Energy a land lease to install PV array #2 (South) to help the utility diversify their portfolio with the renewable source.

- NV energy owned Carey Substation, located at intersection of E Cary Ave and N Nellis Blvd, provides 11 MVA interconnection to existing base circuit 9. Circuit extends underground from Carey Substation to a new Nellis owned switch located at Clinton Substation.
- Renewable PV Array 1 (north) – 13.5 MW operated by Brookfield Renewables via Solar Star NAFB LLC. Connected to circuits 5 & 6. Metered and billed separately.
- Renewable PV Array 2 (south) – 15MW operated by NVE. Connected to circuit #1 & #2. Combined in NVE standard monthly bill.
- PV arrays provide power required to meet daytime demand requirements of the base.
- NVE metering based on Time Of Use Schedule:
    - Summer On-peak = 1pm – 7pm.
    - Summer Mid-Peak = 10am – 1pm and 7pm to 10pm.
    - Summer off-peak = 10pm to 10am.
    - On-Peak will change to 1pm – 9pm in 2024.

Proposed Action Potential Infrastructure Capacity Requirements

- Preliminary estimated demand load for complete build out of Alternative 1 is 22MVA.
- Per NV Energy, the capacity in the existing 69kV transmission system and/or existing utility owned local 69/12.47kV substations is adequate for the anticipated demand.
- Three possible options for required utility service:
    - Option 1 – utilize existing primary system capacity in distribution system (600A, 12.47 kV = 12 MVA) by extending existing primary circuits into new east side functional areas.
    - Option 2 – NV Energy to provide 69kV from circuit along Carey Ave to new Nellis owned substation located in the SE corner of the base.
    - Option 3 – NV Energy to provide multiple 12.47kV distribution circuits from Carey Substation to new Nellis owned switchgear located in the proposed action area.
- Once the proposed action moves into a planning phase, the first step in developing a new utility service would be for NV Energy to complete an Information Only Economic Development (IOED) feasibility study to determine a point of connection and a preliminary cost estimate.

Meeting Minutes

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Meeting Details – Potable Water

Date: 8/17/2023

Time: 0900 – 1000

Attendees:

In Person:

Christopher Arnold, Civil Engineer, Stantec GS, Christopher.Arnold@stantecgs.com
Jeff Blazi, Utility and Energy Manager, 99CES/CENPP, jeffery.blazi@us.af.mil
Brent Morris, USAF Civil Engineer, 99CES/CENMP, Brent.Morris.2@us.af.mil
Chris Perkins, Water Quality PM, 99CES, Christopher.Perkins.19@us.af.mil
Sri Kamojjala, Sr Civil Engineer, LVVWD, sri.kamojjala@lvvwd.com
Bill Turner, Sr. Eng. Tech, LVVWD, Bill.Turner@lvvwd.com
Omar Alvarez, Civil Engineer, LVVWD, Omar.Alvarez@lvwwd.com
Nass Diallo, Engineering Manager, LVVWD, Nass.Diallo@lvwwd.com

By Teams Call:

Bill Murray, william.murray@lvvwd.com
Christopher Krizmanic, chris.krizmanic@lvvwd.com
Christopher Luquette, christopher.luquette@lvvwd.com

Agenda:

- **Introduction**
  - Team Introductions.
  - Review of preliminary action.
- **Preliminary Proposed Plan Review**
  - Base currently has an upper limit of 4,000 af/year.
  - Estimated 200,000-300,000 GPD of potable water use.
  - Fire Demand additional.
  - Industrial use additional.
  - Water Tower proposed.
  - Proposed Connection to Area II to improve water quality.
- **Potable Water Supply Discussion**
  - Is there capacity within the existing transmission lines for this much approximate load?
  - What would the base have to do to obtain the water supply?
  - Will SNWA allow irrigation on its lines?

Proposed Action and Functional Areas

- The Air Force is considering expanding its on base utilities and infrastructure to the east side of the flightline and is preparing an Environmental Impact Statement for this action. The proposed actions are still a work in progress and are awaiting review and approval. They have not been published or officially been made public. These discussions concern the baseline status of existing base wide utilities, an understanding of available utility capacities, and the opportunities or impediments to developing the needed utility infrastructure.
- Functional areas include:
    - Airfield Operations/Industrial/Light Industrial.
    - Administrative.
    - Lodging/Residential.
    - Medical/Community Services/Commercial/ Small scale Retail.
    - Transportation.
    - Utilities/Infrastructure.

Existing Potable Water System

- Presently, the western side of the flightline is served by water from Nellis Blvd and multiple wells in the local area.
- Base personnel discussed the Area II issues. Area II is northeast of the flightline and has water quality issues due to stagnation. The current solution for this area is blowing off water to flush the line when the area is not in use by base personnel.
- The base is currently served by turnout 6B on Nellis Blvd which can supply up to 2 MGPD.

Proposed Action Potential Infrastructure Capacity Requirements

- Overall water supply to the area is adequate for current and future development. Utility staff did not raise concerns about the proposed demand.
- A preliminary layout of the site proposes approximately 4,000,000 sf of buildings for the full buildout (Alternative 1) condition and approximately 2,500 new personnel added to the base, which would increase average demand by 200,000 – 300,000 GPD. Peaking factors are 25%.
- Base and Utility would prefer the completion of the loop around Area II.
- Preliminary proposed plans show a water tower schematically laid out. Utility expressed concerns about chlorine degradation. Base assured that proper chlorination procedures would be implemented.
- Fire demand would be calculated when building sizes are better known.
- No major industrial use is expected.
- Irrigation would only be allowed for non-grass plantings. Non-functional grass is not allowed.
- When a more developed design is complete, the designer should coordinate with SNWA for demand forecast.

Meeting Minutes

ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND MISSION REBALANCE AT NELLIS AIR FORCE BASE, NEVADA

Meeting Details – Stormwater

Date: 8/16/2023

Time: 1330 – 1430

Attendees:

Christopher Arnold, Civil Engineer, Stantec GS, Christopher.Arnold@stantecgs.com
Chris Perkins, Water Quality PM, 99CES, Christopher.Perkins19@us.af.mil

Agenda:

- **Introduction**
  - Team Introductions.
  - Review of preliminary action.
- **Main Discussion**
  - Discussion of existing stormwater areas of concern.
  - Discussion of proposed stormwater management for the east side development.

Proposed action and functional areas

- The Air Force is considering expanding its on base utilities and infrastructure to the east side of the flightline and is preparing an Environmental Impact Statement for this action. The proposed actions are still a work in progress and are awaiting review and approval. They have not been published or officially been made public. These discussions concern the baseline status of existing base wide utilities, an understanding of available utility capacities, and the opportunities or impediments to developing the needed utility infrastructure.
- Functional areas include:
  - Airfield Operations/Industrial/Light Industrial.
  - Administrative.
  - Lodging/Residential.
  - Medical/Community Services/Commercial/ Small scale Retail.
  - Transportation.
  - Utilities/Infrastructure.

Existing Stormwater System

- Presently, the western side of the flightline is served by on site stormwater management systems.
- Presently, the eastern side of the flightline has limited stormwater management practices in place for control of runoff from Frenchman Mountain and the surrounding area.
- Base personnel have reported that during larger rainfall events, the flightline experiences flooding.

Proposed Action Potential Infrastructure Capacity Requirements

- Base understands that stormwater will have to be controlled to meet permitting requirements.
- Options for stormwater management from increase in impervious area were discussed:
    - Option 1: Each facility proposed has small scale, designed underground storage
        - Base was not favorable due to perceived costs, as underground storage would entail large amounts of pipe, stone, or other stormwater capture systems.
    - Option 2: Each facility proposed has small scale, designed above ground storage
        - Base was not favorable due to perceived maintenance issues.
    - Option 3: East side directed to regional stormwater control basin.
        - Base was most favorable to this solution, as it concentrates stormwater operations and maintenance to one location.
- Base also wanted to ensure that flooding was alleviated on flightline. Presently, flooding events occur when large rain events occur, as runoff flows from Frenchman Mountain towards the base. Discussing this problem, a diversion berm/swale will be required to collect the runoff from Frenchman Mountain and direct it to the existing storm sewer system.
- Further analysis is required for any preliminary design of the stormwater management systems, which should be performed with a topographic survey and engineering design.
- The design of the system for stormwater management will proceed with the general site design, as pad and roadway design will be a consideration to which practices are utilized to manage stormwater across the site.

Appendix B
Capacity Calculations

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Stormwater

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Rational Method Calculation for East Side Diversion Berm

A	3600	Acres	
i	1.59	in/hr	Assume 100 year, 60 Minute intensity
C	0.9		Selected based on highly flashy, high runoff soils as reported by base personnel

Rational method, per Kuichling, 1851

Q = C * i * A 5151.6 cfs

Design Assumptions

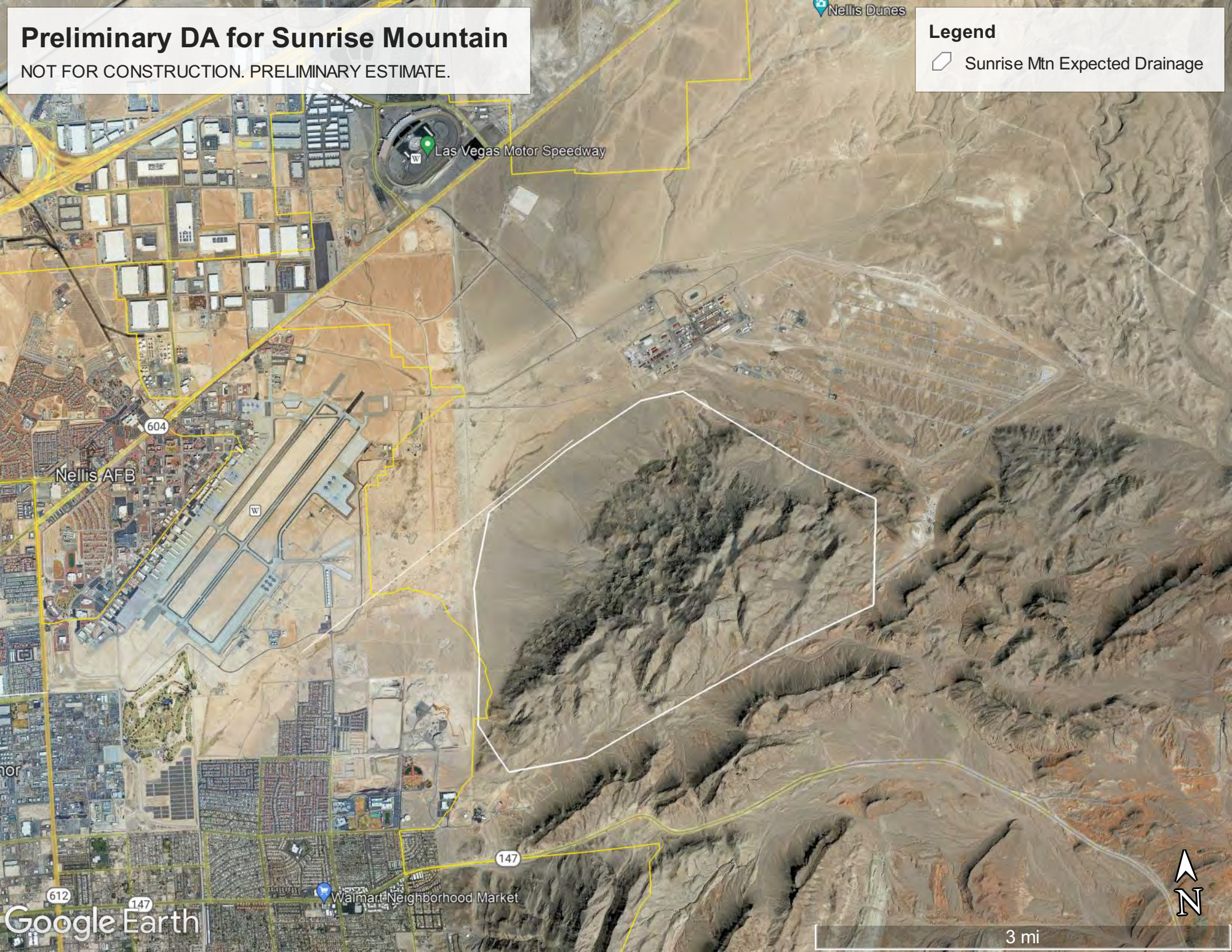
Berm Height	4	ft	
Berm Slope	33%		Slope of berm
Lat. Slope	1.50%		Slope of nearby existing grade, assumed
Long. Slope	0.50%		Running slope at toe of berm
Manning's n	0.015		Assumed to be for entire cross section

Computations performed by Hydrographs Express for Manning's Equation

Based on the assumptions, a berm of the shown configuration will control the storm event selected above. Further design is requried to confirm assumptions.

Preliminary DA for Sunrise Mountain

NOT FOR CONSTRUCTION. PRELIMINARY ESTIMATE.



Legend

Sunrise Mtn Expected Drainage

NOAA Atlas 14, Volume 1, Version 5
Location name: Nellis Afb, Nevada, USA*
Latitude: 36.2327°, Longitude: -114.9554°
Elevation: 2324 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.43 (1.18-1.72)	1.87 (1.56-2.28)	2.68 (2.23-3.26)	3.34 (2.78-4.09)	4.31 (3.56-5.33)	5.12 (4.19-6.37)	6.05 (4.86-7.58)	7.07 (5.57-8.96)	8.59 (6.62-11.1)	9.91 (7.49-13.1)
10-min	1.09 (0.900-1.30)	1.43 (1.19-1.74)	2.03 (1.70-2.48)	2.54 (2.11-3.11)	3.28 (2.71-4.06)	3.90 (3.19-4.84)	4.61 (3.70-5.77)	5.38 (4.24-6.83)	6.54 (5.05-8.48)	7.54 (5.70-9.94)
15-min	0.896 (0.740-1.08)	1.18 (0.980-1.44)	1.68 (1.40-2.06)	2.10 (1.75-2.57)	2.71 (2.24-3.35)	3.22 (2.64-4.00)	3.81 (3.06-4.77)	4.44 (3.51-5.64)	5.41 (4.17-7.01)	6.23 (4.71-8.22)
30-min	0.602 (0.500-0.726)	0.794 (0.660-0.968)	1.13 (0.946-1.38)	1.41 (1.18-1.73)	1.83 (1.51-2.26)	2.17 (1.77-2.70)	2.56 (2.06-3.21)	2.99 (2.36-3.80)	3.64 (2.81-4.72)	4.19 (3.17-5.53)
60-min	0.373 (0.309-0.449)	0.491 (0.409-0.599)	0.700 (0.586-0.856)	0.875 (0.728-1.07)	1.13 (0.933-1.40)	1.34 (1.10-1.67)	1.59 (1.28-1.99)	1.85 (1.46-2.35)	2.25 (1.74-2.92)	2.60 (1.96-3.42)
2-hr	0.229 (0.192-0.276)	0.299 (0.252-0.361)	0.420 (0.350-0.507)	0.520 (0.429-0.626)	0.668 (0.544-0.806)	0.795 (0.640-0.960)	0.938 (0.741-1.14)	1.10 (0.847-1.34)	1.34 (1.00-1.66)	1.54 (1.13-1.93)
3-hr	0.171 (0.144-0.202)	0.221 (0.188-0.264)	0.305 (0.258-0.364)	0.373 (0.314-0.446)	0.472 (0.392-0.564)	0.554 (0.453-0.665)	0.647 (0.520-0.781)	0.751 (0.592-0.913)	0.912 (0.698-1.12)	1.05 (0.787-1.30)
6-hr	0.104 (0.089-0.122)	0.134 (0.116-0.157)	0.184 (0.158-0.215)	0.224 (0.191-0.262)	0.281 (0.237-0.328)	0.326 (0.272-0.383)	0.377 (0.309-0.444)	0.432 (0.347-0.512)	0.515 (0.404-0.618)	0.586 (0.449-0.712)
12-hr	0.060 (0.052-0.068)	0.078 (0.068-0.090)	0.107 (0.093-0.122)	0.129 (0.112-0.147)	0.159 (0.137-0.181)	0.182 (0.156-0.208)	0.207 (0.174-0.238)	0.233 (0.193-0.270)	0.269 (0.218-0.317)	0.301 (0.240-0.358)
24-hr	0.033 (0.029-0.037)	0.043 (0.038-0.049)	0.059 (0.053-0.066)	0.071 (0.063-0.079)	0.087 (0.076-0.097)	0.099 (0.086-0.112)	0.111 (0.096-0.126)	0.124 (0.105-0.143)	0.141 (0.117-0.165)	0.154 (0.127-0.183)
2-day	0.017 (0.015-0.019)	0.023 (0.020-0.026)	0.031 (0.028-0.035)	0.037 (0.033-0.042)	0.045 (0.040-0.051)	0.052 (0.045-0.058)	0.058 (0.050-0.066)	0.064 (0.054-0.074)	0.073 (0.060-0.086)	0.080 (0.065-0.095)
3-day	0.012 (0.010-0.013)	0.016 (0.014-0.018)	0.022 (0.019-0.024)	0.026 (0.023-0.029)	0.032 (0.028-0.035)	0.036 (0.031-0.040)	0.040 (0.034-0.046)	0.045 (0.038-0.051)	0.050 (0.042-0.059)	0.055 (0.045-0.065)
4-day	0.009 (0.008-0.010)	0.012 (0.011-0.014)	0.017 (0.015-0.019)	0.020 (0.018-0.023)	0.025 (0.022-0.028)	0.028 (0.024-0.031)	0.031 (0.027-0.035)	0.035 (0.029-0.040)	0.039 (0.033-0.046)	0.043 (0.035-0.050)
7-day	0.006 (0.005-0.006)	0.008 (0.007-0.009)	0.011 (0.009-0.012)	0.013 (0.011-0.014)	0.015 (0.013-0.017)	0.017 (0.015-0.019)	0.019 (0.016-0.022)	0.021 (0.018-0.024)	0.024 (0.020-0.027)	0.026 (0.021-0.030)
10-day	0.004 (0.004-0.005)	0.006 (0.005-0.006)	0.008 (0.007-0.009)	0.009 (0.008-0.011)	0.011 (0.010-0.013)	0.013 (0.011-0.014)	0.014 (0.012-0.016)	0.015 (0.013-0.018)	0.017 (0.014-0.020)	0.018 (0.015-0.022)
20-day	0.002 (0.002-0.002)	0.003 (0.003-0.003)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.007 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.008-0.012)	0.011 (0.009-0.013)
30-day	0.002 (0.001-0.002)	0.002 (0.002-0.003)	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.004-0.006)	0.006 (0.005-0.007)	0.007 (0.006-0.008)	0.007 (0.006-0.008)	0.008 (0.007-0.010)	0.009 (0.007-0.010)
45-day	0.001 (0.001-0.001)	0.002 (0.001-0.002)	0.002 (0.002-0.003)	0.003 (0.003-0.003)	0.004 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.004-0.006)	0.006 (0.005-0.007)	0.006 (0.005-0.007)	0.007 (0.006-0.008)
60-day	0.001 (0.001-0.001)	0.001 (0.001-0.001)	0.002 (0.002-0.002)	0.002 (0.002-0.003)	0.003 (0.003-0.004)	0.004 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.004-0.006)	0.006 (0.005-0.007)	0.006 (0.005-0.007)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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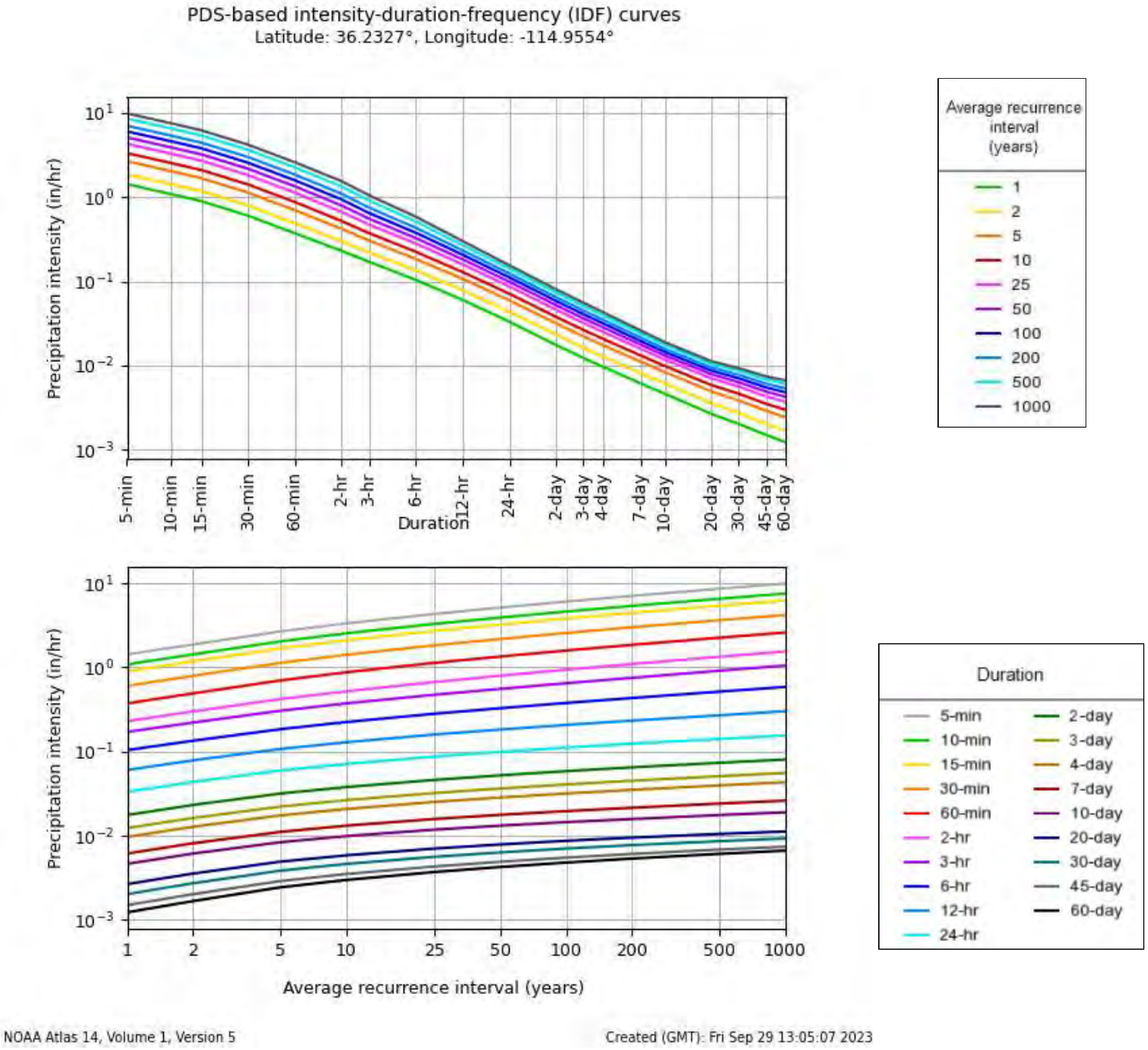
PF graphical



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Created (GMT): Fri Sep 29 13:05:07 2023

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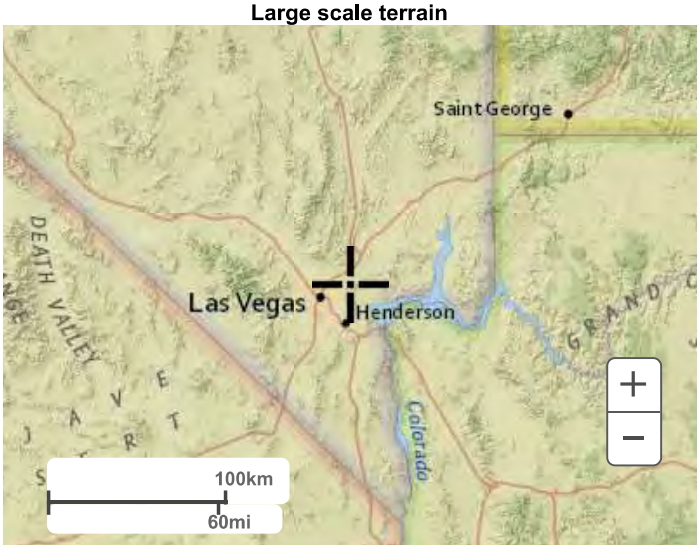
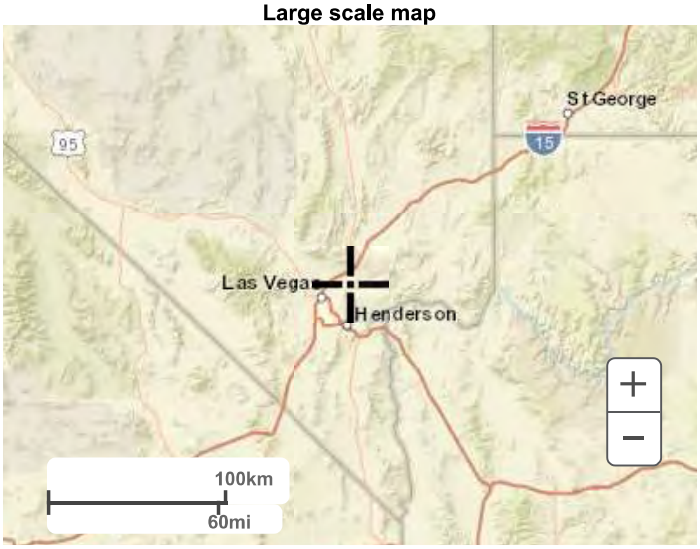
Maps & aerials

Small scale terrain

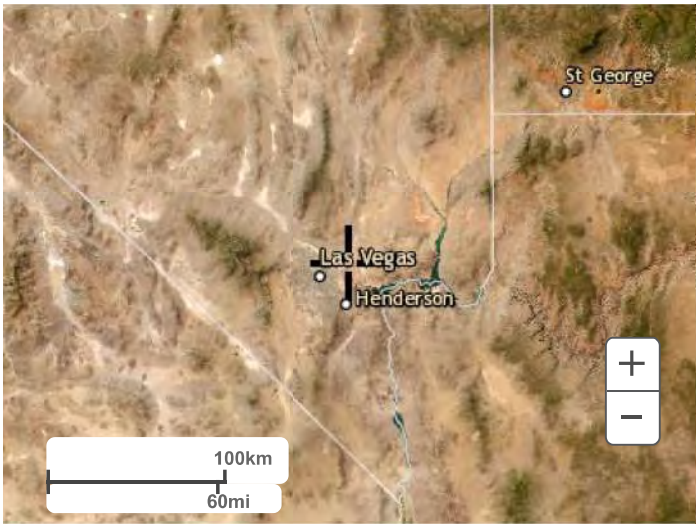
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Sep 29 2023

Berm Along East of Base

User-defined

Invert Elev (ft)	= 1000.00
Slope (%)	= 0.50
N-Value	= 0.015

Calculations

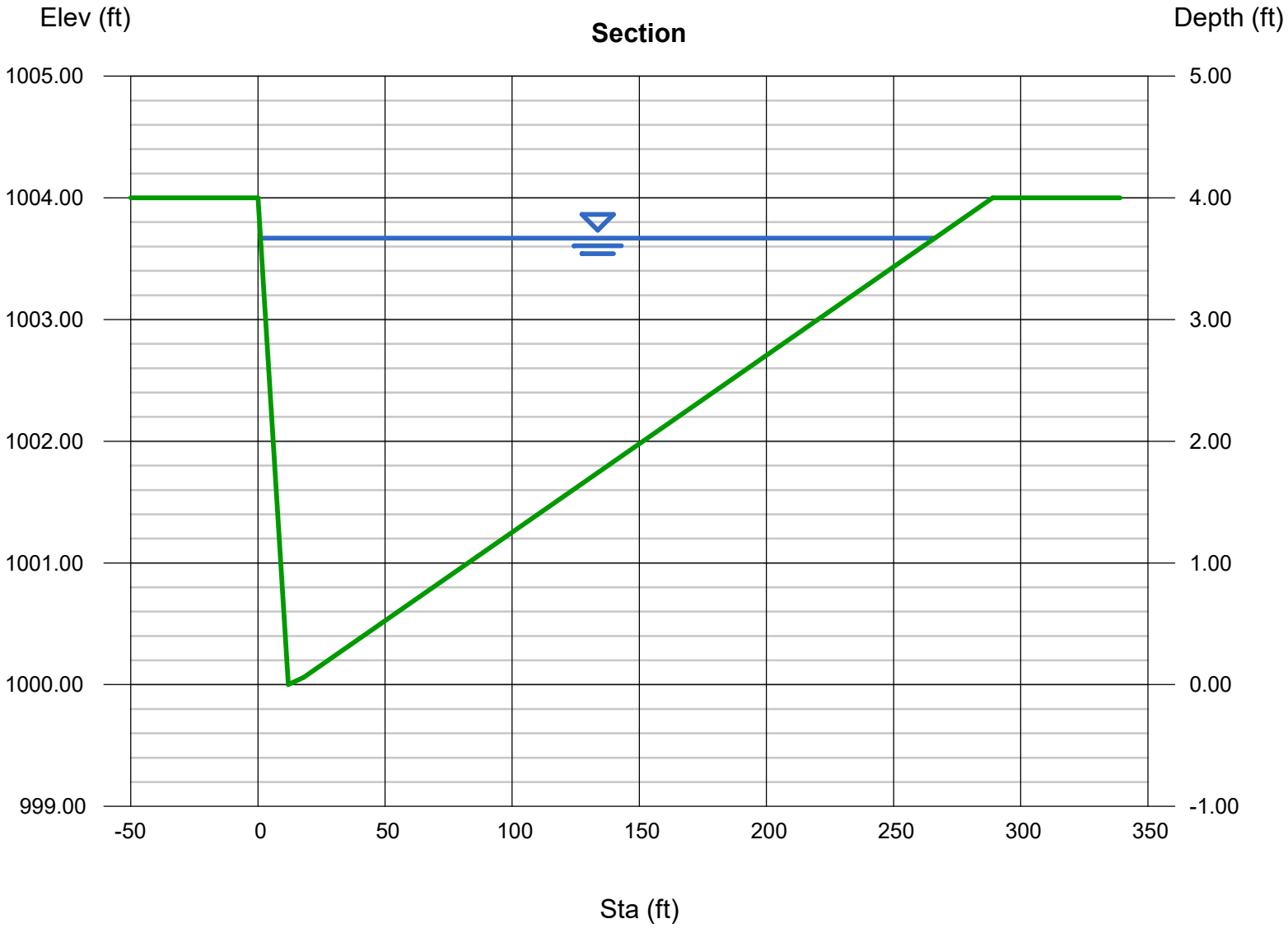
Compute by:	Known Q
Known Q (cfs)	= 5152.00

Highlighted

Depth (ft)	= 3.67
Q (cfs)	= 5,152
Area (sqft)	= 490.22
Velocity (ft/s)	= 10.51
Wetted Perim (ft)	= 265.93
Crit Depth, Yc (ft)	= 4.00
Top Width (ft)	= 265.31
EGL (ft)	= 5.39

(Sta, El, n)-(Sta, El, n)...

(0.00, 1004.00)-(12.00, 1000.00, 0.015)-(18.00, 1000.06, 0.015)-(289.00, 1004.00, 0.015)



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Electrical

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Nellis East Side Development

Monthly Electrical Demand and Consumption

MONTH	NV ENERGY PEAK DEMAND (KW)	NV ENERGY UTILITY & NSA II CONSUMPTION (KWH)	SOLAR STAR NSA I ARRAY CONSUMPTION (KWH)	NELLIS AFB TOTAL CONSUMPTION (KWH)	NSA I GENERATION % OF TOTAL (KWH)
JUNE 2022	20,295	10,117,525	1,990,421	12,107,946	16%
JULY 2022	22,463	11,748,483	1,828,748	13,577,231	13%
AUG 2022	21,014	11,692,761	1,676,140	13,368,901	13%
SEP 2022	21,044	10,049,008	1,772,442	11,821,450	15%
OCT 2022	17,833	8,329,708	1,701,277	10,030,985	17%
NOV 2022	13,443	7,030,775	1,203,711	8,234,486	15%
DEC 2022	13,119	7,510,344	981,724	8,492,068	12%
JAN 2023	13,666	7,756,388	1,015,632	8,772,020	12%
FEB 2023	13,885	6,795,873	1,253,089	8,048,962	16%
MAR 2023	22,463	7,206,244	1,417,213	8,623,457	16%
APR 2023	22,632	6,734,287	2,036,506	8,770,793	23%
MAY 2023	18,432	8,757,447	2,117,883	10,875,330	19%
TOTALS		103,728,843	18,994,786	122,723,629	15%
AVERAGE	18,357	8,644,070	1,582,899	10,226,969	

Nellis AFB EIS DOPAA - Master Plan and Installation Development - East Side
Estimated Electrical Demand
Alternative 1

FUNCTIONAL AREAS	EXAMPLE PROJECTS	ESTIMATED OVERALL BLDG SIZE (SF)	EST. DEMAND (WATT/SF)	EST. TOTAL LOAD (KW)	SERVICE DEMAND FACTOR %	SERVICE SIZE (kVA)	ESTINATED COINCIDENCE FACTOR %	ESTIMATED PROJECTED LOAD (KVA)
1. Airfield Operations/Industrial/ Light Industrial	Terminals	140,000	13.5	1890	80%	1,512	60%	907
	Hangars	1,100,000	25	27500	65%	17,875	60%	10,725
	Maintenance/Shops	125,000	25	3125	50%	1,563	60%	938
	Warehouse	200,000	8	1600	75%	1,200	60%	720
2. Administration/Small-scale Administartive	AUDITORIUMS	400,000	8	3200	60%	1,920	60%	1,152
	SIMULATORS	280,000	20	5600	70%	3,920	60%	2,352
	ADMIN	250,000	8	2000	65%	1,300	60%	780
	Training	600,000	8	4800	60%	2,880	60%	1,728
3. Medical/Community Services/Commercial/Retail	Fitness center, shopette, food court, commissary, and Base Exchange	150,000	7	1050	60%	630	60%	378
4. Lodging/Residential	Dormitories	440,000	6	2640	40%	1,056	60%	634
5. Outdoor Rec/Training	Parks, Playgrounds, Gunfighter Drop Zone	0						0
6. Transportation	Roads, Expansion of Security Gate Areas	0						**0**
7. Utilities/Infrastucture	Electrical Substation, de-arsenic plant, water plant, liquid oxygen plant, and	110,000	12	1320	80%	1,056	60%	634
	TOTAL	**3,795,000**		**54,725**		**34,912**		**20,947**

Nellis AFB EIS DOPAA - Master Plan and Installation Development - East Side
Estimated Electrical Demand
Alternative 2

FUNCTIONAL AREAS	EXAMPLE PROJECTS	ESTIMATED OVERALL BLDG SIZE (SF)	EST. DEMAND (WATT/SF)	EST. TOTAL LOAD (KW)	SERVICE DEMAND FACTOR %	SERVICE SIZE (kVA)	ESTINATED COINCIDENCE FACTOR %	ESTIMATED PROJECTED LOAD (KVA)
1. Airfield Operations/Industrial/ Light Industrial	Terminals	140,000	13.5	1890	80%	1,512	60%	907
	Hangars	1,100,000	25	27500	65%	17,875	60%	10,725
	Maintenance/Shops	125,000	25	3125	50%	1,563	60%	938
	Warehouse	200,000	8	1600	75%	1,200	60%	720
2. Administration/Small-scale Administartive	AUDITORIUMS	400,000	8	3200	60%	1,920	60%	1,152
	SIMULATORS	280,000	20	5600	70%	3,920	60%	2,352
	ADMIN	0	8	0	65%	0	60%	0
	Training	0	8	0	60%	0	60%	0
3. Medical/Community Services/Commercial/Retail	Fitness center, shopette, food court, commissary, and Base Exchange	50,000	7	350	60%	210	60%	126
4. Lodging/Residential	Dormitories	0						0
5. Outdoor Rec/Training	Parks, Playgrounds, Gunfighter Drop Zone	0						0
6. Transportation	Roads, Expansion of Security Gate Areas	0						**0**
7. Utilities/Infrastucture	Electrical Substation, de-arsenic plant, water plant, liquid oxygen plant, and	100,000	12	1200	80%	960	60%	576
	TOTAL	**2,395,000**		**44,465**		**29,160**		**17,496**

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Transportation

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Existing Gate Counts

Column>			(A)	(B)	(C)	(D)
Row			AM Peak Hour		PM Peak Hour	
	#	Gate	Entry	Exit	Entry	Exit
(1)	15	Area II LVIS Gate	625	26	58	310
(2)	16	Beale Gate	728	187	262	815
(3)	17	Main Gate	728	238	454	815
(4)	18	Simons Gate	398	51	44	344
(5)		Hollywood Gate				
(6)		Total	2479	502	818	2284

Alternative 1

#	Gate	Diversion to	AM Peak Hour Entry	AM Peak Hour Exit	PM Peak Hour Entry	PM Peak Hour Exit
15	Area II LVIS Gate	5%	642	27	60	319
16	Beale Gate	25%	590	152	213	661
17	Main Gate	10%	708	232	442	793
18	Simons Gate	25%	323	42	36	279
	Hollywood Gate		415	90	133	415
	Total (Includes 8% Growth)		2678	543	884	2467

	(A)	(B)	(C)	(D)	(E)
		AM Peak Hour		PM Peak Hour	
#	Diversion to	Entry	Exit	Entry	Exit
(1) 15	5%	625 x 1.08 x (1-0.05)	26 x 1.08 x (1-0.05)	58 x 1.08 x (1-0.05)	310 x 1.08 x (1-0.05)
(2) 16	25%	728 x 1.08 x (1-0.25)	187 x 1.08 x (1-0.25)	262 x 1.08 x (1-0.25)	815 x 1.08 x (1-0.25)
(3) 17	10%	728 x 1.08 x (1-0.10)	238 x 1.08 x (1-0.10)	454 x 1.08 x (1-0.10)	815 x 1.08 x (1-0.10)
(4) 18	25%	398 x 1.08 x (1-0.25)	51 x 1.08 x (1-0.25)	44 x 1.08 x (1-0.25)	344 x 1.08 x (1-0.25)
(5) Hollywood Gate		(B6) - (B1) - (B2) - (B3) - (B4)	(C6) - (C1) - (C2) - (C3) - (C4)	(D6) - (D1) - (D2) - (D3) - (D4)	(E6) - (E1) - (E2) - (E3) - (E4)
(6) Total (Includes 8% Growth)		2479 x 1.08	502 x 1.08	818 x 1.08	2284 x 1.08

Alternative 2

#	Gate	Diversion to	AM Peak Hour Entry	AM Peak Hour Exit	PM Peak Hour Entry	PM Peak Hour Exit
15	Area II LVIS Gate	5%	654	28	61	324
16	Beale Gate	25%	601	155	217	673
17	Main Gate	10%	721	236	450	807
18	Simons Gate	25%	329	43	37	284
	Hollywood Gate		422	91	135	425
	Total (Includes 10% Growth)		2727	553	900	2513

	(A)	(B)	(C)	(D)	(E)
		AM Peak Hour		PM Peak Hour	
#	Diversion to	Entry	Exit	Entry	Exit
(1) 15	5%	625 x 1.10 x (1-0.05)	26 x 1.10 x (1-0.05)	58 x 1.10 x (1-0.05)	310 x 1.10 x (1-0.05)
(2) 16	25%	728 x 1.10 x (1-0.25)	187 x 1.10 x (1-0.25)	262 x 1.10 x (1-0.25)	815 x 1.10 x (1-0.25)
(3) 17	10%	728 x 1.10 x (1-0.10)	238 x 1.10 x (1-0.10)	454 x 1.10 x (1-0.10)	815 x 1.10 x (1-0.10)
(4) 18	25%	398 x 1.10 x (1-0.25)	51 x 1.10 x (1-0.25)	44 x 1.10 x (1-0.25)	344 x 1.10 x (1-0.25)
(5) Hollywood Gate		(B6) - (B1) - (B2) - (B3) - (B4)	(C6) - (C1) - (C2) - (C3) - (C4)	(D6) - (D1) - (D2) - (D3) - (D4)	(E6) - (E1) - (E2) - (E3) - (E4)
(6) Total (Includes 10% Growth)		2479 x 1.10	502 x 1.10	818 x 1.10	2284 x 1.10

No Action

#	Gate	Diversion to	AM Peak Hour Entry	AM Peak Hour Exit	PM Peak Hour Entry	PM Peak Hour Exit
15	Area II LVIS Gate	0%	688	29	64	341
16	Beale Gate	0%	801	206	289	897
17	Main Gate	0%	801	262	499	897
18	Simons Gate	0%	437	56	48	378
	Hollywood Gate					
	Total (Includes 10% Growth)		2727	553	900	2513

	(A)	(B)	(C)	(D)	(E)
		AM Peak Hour		PM Peak Hour	
#	Diversion to	Entry	Exit	Entry	Exit
(1) 15	5%	625 x 1.10	26 x 1.10	58 x 1.10	310 x 1.10
(2) 16	25%	728 x 1.10	187 x 1.10	262 x 1.10	815 x 1.10
(3) 17	10%	728 x 1.10	238 x 1.10	454 x 1.10	815 x 1.10
(4) 18	25%	398 x 1.10	51 x 1.10	44 x 1.10	344 x 1.10
(5) Hollywood Gate					
(6) Total (Includes 10% Growth)		2479 x 1.10	502 x 1.10	818 x 1.10	2284 x 1.10

Existing Gate Counts

Column>			(A)	(B)	(C)	(D)
Row			**AM Peak Hour**		**PM Peak Hour**	
	#	Gate	**Entry**	**Exit**	**Entry**	**Exit**
(1)	15	Area II LVIS Gate	625	26	58	310
(2)	16	Beale Gate	728	187	262	815
(3)	17	Main Gate	728	238	454	815
(4)	18	Simons Gate	398	51	44	344
(5)		Hollywood Gate				
(6)		Total	2479	502	818	2284

Alternative 1

#	Gate	Diversion to	**AM Peak Hour**		**PM Peak Hour**	
			Entry	**Exit**	**Entry**	**Exit**
15	Area II LVIS Gate	5%	642	27	60	319
16	Beale Gate	25%	590	152	213	661
17	Main Gate	10%	708	232	442	793
18	Simons Gate	25%	323	42	36	279
	Hollywood Gate		415	90	133	415
	Total (Includes 8% Growth)		2678	543	884	2467

Alternative 2

#	Gate	Diversion to	**AM Peak Hour**		**PM Peak Hour**	
			Entry	**Exit**	**Entry**	**Exit**
15	Area II LVIS Gate	5%	654	28	61	324
16	Beale Gate	25%	601	155	217	673
17	Main Gate	10%	721	236	450	807
18	Simons Gate	25%	329	43	37	284
	Hollywood Gate		422	91	135	425
	Total (Includes 10% Growth)		2727	553	900	2513

No Action

#	Gate	Diversion to	**AM Peak Hour**		**PM Peak Hour**	
			Entry	**Exit**	**Entry**	**Exit**
15	Area II LVIS Gate	0%	688	29	64	341
16	Beale Gate	0%	801	206	289	897
17	Main Gate	0%	801	262	499	897
18	Simons Gate	0%	437	56	48	378

	Hollywood Gate					
Total (Includes 10% Growth)			2727	553	900	2513

			(A)	(B)
	#	Gate	Diversion to	**AM Pea Entry**
(1)	15	Area II LVIS Gate	5%	625 x 1.08 x (1-0.05)
(2)	16	Beale Gate	25%	728 x 1.08 x (1-0.25)
(3)	17	Main Gate	10%	728 x 1.08 x (1-0.10)
(4)	18	Simons Gate	25%	398 x 1.08 x (1-0.25)
(5)		Hollywood Gate		(B6) - (B1) - (B2) - (B3) - (B4)
(6)		Total (Includes 8% Growth)		2479 x 1.08

			(A)	(B)
	#	Gate	Diversion to	**AM Pea Entry**
(1)	15	Area II LVIS Gate	5%	625 x 1.10 x (1-0.05)
(2)	16	Beale Gate	25%	728 x 1.10 x (1-0.25)
(3)	17	Main Gate	10%	728 x 1.10 x (1-0.10)
(4)	18	Simons Gate	25%	398 x 1.10 x (1-0.25)
(5)		Hollywood Gate		(B6) - (B1) - (B2) - (B3) - (B4)
(6)		Total (Includes 10% Growth)		2479 x 1.10

			(A)	(B)
	#	Gate	Diversion to	**AM Pea Entry**
(1)	15	Area II LVIS Gate	5%	625 x 1.10
(2)	16	Beale Gate	25%	728 x 1.10
(3)	17	Main Gate	10%	728 x 1.10
(4)	18	Simons Gate	25%	398 x 1.10

(5)		Hollywood Gate		
(6)	Total (Includes 10% Growth)			2479 x 1.10

(C)	(D)	(E)
ak Hour	**PM Peak Hour**	
Exit	**Entry**	**Exit**
26 x 1.08 x (1-0.05)	58 x 1.08 x (1-0.05)	310 x 1.08 x (1-0.05)
187 x 1.08 x (1-0.25)	262 x 1.08 x (1-0.25)	815 x 1.08 x (1-0.25)
238 x 1.08 x (1-0.10)	454 x 1.08 x (1-0.10)	815 x 1.08 x (1-0.10)
51 x 1.08 x (1-0.25)	44 x 1.08 x (1-0.25)	344 x 1.08 x (1-0.25)
(C6) - (C1) - (C2) - (C3) - (C4)	(D6) - (D1) - (D2) - (D3) - (D4)	(E6) - (E1) - (E2) - (E3) - (E4)
502 x 1.08	818 x 1.08	2284 x 1.08

(C)	(D)	(E)
ak Hour	**PM Peak Hour**	
Exit	**Entry**	**Exit**
26 x 1.10 x (1-0.05)	58 x 1.10 x (1-0.05)	310 x 1.10 x (1-0.05)
187 x 1.10 x (1-0.25)	262 x 1.10 x (1-0.25)	815 x 1.10 x (1-0.25)
238 x 1.10 x (1-0.10)	454 x 1.10 x (1-0.10)	815 x 1.10 x (1-0.10)
51 x 1.10 x (1-0.25)	44 x 1.10 x (1-0.25)	344 x 1.10 x (1-0.25)
(C6) - (C1) - (C2) - (C3) - (C4)	(D6) - (D1) - (D2) - (D3) - (D4)	(E6) - (E1) - (E2) - (E3) - (E4)
502 x 1.10	818 x 1.10	2284 x 1.10

(C)	(D)	(E)
ak Hour	**PM Peak Hour**	
Exit	**Entry**	**Exit**
26 x 1.10	58 x 1.10	310 x 1.10
187 x 1.10	262 x 1.10	815 x 1.10
238 x 1.10	454 x 1.10	815 x 1.10
51 x 1.10	44 x 1.10	344 x 1.10

502 x 1.10	818 x 1.10	2284 x 1.10

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Appendix C
PACES Cost Estimate Reports

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Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
PRIMARY FACILITIES									
WATER DISTRIBUTION (ADVANCED)									
G	**BUILDING SITEWORK**								
G10	**SITE PREPARATIONS**								
G1030	SITE EARTHWORK								
G103002	COMMON EXCAVATION								
G1030020262	Cat 235, 1.91m3 (2.5 CY), Soil/Sand, Trenching	21,132.56	CY	$4.66	$0.00	$68,170.93	$30,361.78	$0.00	$98,532.71
G103004	FILL & BORROW								
G1030040401	950, 2.29m3 (3 CY), Backfill W/Excavated Material	18,089.16	CY	$5.01	$0.00	$49,189.75	$41,479.06	$0.00	$90,668.80
G103005	COMPACTION								
G1030050511	Compact Soil W/Vibrating Plate	18,089.16	CY	$7.04	$0.00	$122,763.31	$4,643.36	$0.00	$127,406.67
G1030050515	Compact With Pogosticks	2,911.36	CY	$38.48	$0.00	$104,386.69	$7,640.82	$0.00	$112,027.52
Marked Up Cost					**$0.00**	**$344,510.69**	**$84,125.01**	**$0.00**	**$428,635.70**
G30	**SITE CIVIL/MECHANICAL UTILITIES**								
G3010	WATER SUPPLY								
G301002	POTABLE WATER DISTRIBUTION								
G3010022051	Piping, water distribution, polyvinyl chloride, 8" diameter, AWWA C900, Class 160, SDR 26	31,278.00	LF	$36.61	$1,144,977.07	$0.00	$0.00	$0.00	$1,144,977.07
G301004	FIRE PROTECTION WATER DISTRIBUTION								
G3010043003	Fire hydrants, two way, breakable, 8'-0" depth, 5-1/4", includes mechanical joints, excludes excavation	63.00	EA	$10,195.80	$583,568.08	$55,967.94	$2,799.57	$0.00	$642,335.59
G301050	WATER DISTRIBUTION ATTRIBUTES								
G3010502409	Water supply meter, domestic/commercial, bronze, compound, flanged, to 1800 GPM, 8" diameter	1.00	EA	$21,170.70	$16,236.84	$4,933.85	$0.00	$0.00	$21,170.70
G3010502609	Gate valves, cast iron, mechanical joint, with boxes, 250 PSI, 8" diameter	2.00	EA	$8,119.90	$14,586.54	$1,472.67	$180.58	$0.00	$16,239.79
G3010502808	Backflow preventer, corrosion resistant, automatic operation, threaded, 8" pipe size	1.00	EA	$15,950.71	$12,829.77	$3,120.94	$0.00	$0.00	$15,950.71
G3094	OTHER SITE UTILITY INFRASTRUCTURE								

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G309408	OTHER UTILITY INFRASTRUCTUE								
G3094089901	Underground marking tape, vinyl, aluminum foil core, detectable, 2"	31,278.00	LF	$0.12	$1,332.08	$2,350.83	$0.00	$0.00	$3,682.91
Marked Up Cost					**$1,773,530.38**	**$67,846.23**	**$2,980.15**	**$0.00**	**$1,844,356.76**
				Facility Marked Up Cost:	**$1,773,530.38**	**$412,356.92**	**$87,105.16**	**$0.00**	**$2,272,992.46**

WATER STORAGE TANKS

G	**BUILDING SITEWORK**
G30	**SITE CIVIL/MECHANICAL UTILITIES**
G3010	WATER SUPPLY
G301003	POTABLE WATER STORAGE

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G3010030335	3785410.00 L (1,000,000 Gal) Water Tanks, Elevated 30.48m+ (100 Ft+)	2.00	EA	$8,786,134.35	$11,476,073.57	$5,278,362.89	$817,832.24	$0.00	$17,572,268.70
Marked Up Cost					**$11,476,073.57**	**$5,278,362.89**	**$817,832.24**	**$0.00**	**$17,572,268.70**
				Facility Marked Up Cost:	**$11,476,073.57**	**$5,278,362.89**	**$817,832.24**	**$0.00**	**$17,572,268.70**
				Primary Facilities Total Marked Up Cost:	**$0.00**	**$5,690,719.81**	**$904,937.40**	**$0.00**	**$19,845,261.15**
				Total Facilities Marked Up Cost:	**$13,249,603.95**	**$5,690,719.81**	**$904,937.40**	**$0.00**	**$19,845,261.15**

Assembly Detail Report

Assembly	Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
								In-Project Lump Sums(s)
							Pavement:	0.00
							Site Improvements:	0.00
							Utilities:	0.00
							Estimated Contract Cost:	**$19,845,261.15**
						Contingency:	5.00%	$992,263.06
						SIOH:	5.70%	$1,187,738.88
						Design	4.00%	$793,810.45
						Other	0.00%	$0.00
							Total Project Cost:	**$22,819,073.54**
								Out-of-Project Lump Sum(s)

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Project Midpoint: Dec 2025
Area Cost Factor: 1.160
Escalation Rate: 25.6
2022 Cost Book
PACES 1.5.06.4

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
PRIMARY FACILITIES									
SANITARY SEWER									
G	BUILDING SITEWORK								
G10	SITE PREPARATIONS								
G1020	SITE DEMOLITION & RELOCATIONS								
G102007	SITE CLEANUP								
G1020070401	Dump Charge	9,117.28	CY	$31.94	$291,218.04	$0.00	$0.00	$0.00	$291,218.04
G1030	SITE EARTHWORK								
G103002	COMMON EXCAVATION								
G1030020224	966, 3.06m3 (4 CY), Wheel Loader	54.00	HR	$412.21	$0.00	$8,829.43	$13,430.12	$0.00	$22,259.55
G1030020262	Cat 235, 1.91m3 (2.5 CY), Soil/Sand, Trenching	24,231.65	CY	$4.66	$0.00	$78,168.20	$34,814.33	$0.00	$112,982.53
G1030020288	19.88m3 (26 CY), Semi Dump	218.00	HR	$297.90	$0.00	$28,884.13	$36,057.85	$0.00	$64,941.98
G103004	FILL & BORROW								
G1030040401	950, 2.29m3 (3 CY), Backfill W/Excavated Material	16,937.83	CY	$5.01	$0.00	$46,058.94	$38,839.02	$0.00	$84,897.96
G1030040405	950, 2.29m3 (3 CY), Delivered & Dumped, Backfill W/Sand	4,813.57	CY	$63.35	$192,189.78	$57,293.72	$55,475.01	$0.00	$304,958.50
G103005	COMPACTION								
G1030050511	Compact Soil W/Vibrating Plate	16,937.83	CY	$7.04	$0.00	$114,949.74	$4,347.82	$0.00	$119,297.55
G1030050515	Compact With Pogosticks	4,813.57	CY	$38.48	$0.00	$172,590.36	$12,633.14	$0.00	$185,223.50
Marked Up Cost					$483,407.82	$506,774.51	$195,597.29	$0.00	$1,185,779.62
G30	SITE CIVIL/MECHANICAL UTILITIES								
G3020	SANITARY SEWER								
G302001	SANITARY SEWER PIPING								
G3020010118	609.60mm (24") ESVCP, CL 200, Premium Joints	24,618.00	LF	$368.98	$6,021,727.70	$2,916,020.25	$145,864.22	$0.00	$9,083,612.17
G302002	SANITARY SEWER MANHOLES & CLEANOUTS								
G3020020201	Precast, CIP Base, 1.22m Dia, 1.83m Deep (4' Dia, 6' Deep), Manhole	83.00	EA	$4,914.85	$236,471.99	$160,395.78	$11,064.99	$0.00	$407,932.76

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Area Cost Factor: 1.160
2022 Cost Book

Project Midpoint: Dec 2025
Escalation Rate: 25.6
PACES 1.5.06.4

Assembly Detail Report

Assembly	Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
Marked Up Cost				$6,258,199.69	$3,076,416.03	$156,929.20	$0.00	$9,491,544.93
Facility Marked Up Cost:				$6,741,607.51	$3,583,190.54	$352,526.49	$0.00	$10,677,324.54
Primary Facilities Total Marked Up Cost:				$0.00	$3,583,190.54	$352,526.49	$0.00	$10,677,324.54
Total Facilities Marked Up Cost:				$6,741,607.51	$3,583,190.54	$352,526.49	$0.00	$10,677,324.54

In-Project Lump Sums(s)

Pavement:	0.00
Site Improvements:	0.00
Utilities:	0.00

Estimated Contract Cost:		$10,677,324.54
Contingency:	5.00%	$533,866.23
SIOH:	5.70%	$639,037.87
Design	4.00%	$427,092.98
Other	0.00%	$0.00
Total Project Cost:		$12,277,321.63

Out-of-Project Lump Sum(s)

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Project Midpoint: Dec 2025
Area Cost Factor: 1.160
Escalation Rate: 25.6

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
PRIMARY FACILITIES									
BERM									
A	SUBSTRUCTURE								
A10	FOUNDATIONS								
A1030	SLAB ON GRADE								
A103002	STRUCTURAL SLAB ON GRADE								
A1030020212	<=152.4 mm(6"), Rod Reinf, Concrete Slab On Grade	295,290.00	SF	$21.26	$3,343,977.00	$2,631,851.69	$300,569.79	$0.00	$6,276,398.48
A103005	FOUNDATION DRAINAGE								
A1030050601	Drainage	41,280.00	LF	$56.40	$948,195.60	$1,297,483.94	$82,537.29	$0.00	$2,328,216.83
Marked Up Cost					$4,292,172.59	$3,929,335.64	$383,107.08	$0.00	$8,604,615.31
A20	BASEMENT CONSTRUCTION								
A2020	BASEMENT WALLS								
A202002	MOISTURE PROTECTION								
A2020020201	Basement Moisture Protection, 1/8" Thick Asphalt	241,280.00	SF	$5.52	$445,243.34	$886,314.86	$0.00	$0.00	$1,331,558.20
Marked Up Cost					$445,243.34	$886,314.86	$0.00	$0.00	$1,331,558.20
G	BUILDING SITEWORK								
G10	SITE PREPARATIONS								
G1020	SITE DEMOLITION & RELOCATIONS								
G102007	SITE CLEANUP								
G1020070101	General Area Cleanup	15.60	ACRE	$10,164.73	$0.00	$111,531.81	$47,037.96	$0.00	$158,569.77
G1030	SITE EARTHWORK								
G103001	GRADING								
G1030010105	Fine Grading, Hand	30,482.00	SY	$27.67	$0.00	$843,500.52	$0.00	$0.00	$843,500.52
G103002	COMMON EXCAVATION								
G1030020212	Hand Excavation, Sand/Gravel	2,064.00	CY	$304.90	$0.00	$629,311.68	$0.00	$0.00	$629,311.68

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G1030020298	0.38m3 (1/2 CY) Crawler Mounted, Hydraulic Excavator	41,280.00	CY	$22.58	$0.00	$794,258.33	$137,641.04	$0.00	$931,899.37
G103004	FILL & BORROW								
G1030040405	950, 2.29m3 (3 CY), Delivered & Dumped, Backfill W/Sand	41,280.00	CY	$68.63	$1,785,365.28	$532,235.46	$515,340.36	$0.00	$2,832,941.10
G103005	COMPACTION								
G1030050511	Compact Soil W/Vibrating Plate	4,128.00	CY	$7.63	$0.00	$30,346.90	$1,147.83	$0.00	$31,494.73
G1030050514	Compact Soil By Machine W/Roller	37,156.00	CY	$3.74	$0.00	$75,779.55	$63,267.65	$0.00	$139,047.20
Marked Up Cost					$1,785,365.28	$3,016,964.26	$764,434.83	$0.00	$5,566,764.37
G20	SITE IMPROVEMENTS								
G2050	LANDSCAPING								
G205002	EROSION CONTROL MEASURES								
G2050020201	Sediment Fence, Temporary	40,800.00	LF	$25.95	$324,687.36	$675,812.95	$58,283.60	$0.00	$1,058,783.91
G205003	TOPSOIL & PLANTING BEDS								
G2050030301	Topsoil, 152.40mm (6") Lifts, Off-Site	4,128.00	CY	$100.28	$311,405.79	$80,077.37	$22,459.61	$0.00	$413,942.77
Marked Up Cost					$636,093.15	$755,890.32	$80,743.21	$0.00	$1,472,726.69
				Facility Marked Up Cost:	$7,158,874.37	$8,588,505.07	$1,228,285.13	$0.00	$16,975,664.57

EXCAVATION, CUT AND FILL

G	BUILDING SITEWORK								
G10	SITE PREPARATIONS								
G1030	SITE EARTHWORK								
G103002	COMMON EXCAVATION								
G1030020235	Crawler Mounted, 4.21m3 (5.5 CY), Koehring 1266, Hyd Excavator	3,162.00	HR	$793.86	$0.00	$627,440.99	$1,882,732.90	$0.00	$2,510,173.89
Marked Up Cost					$0.00	$627,440.99	$1,882,732.90	$0.00	$2,510,173.89

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
				Facility Marked Up Cost:	$0.00	$627,440.99	$1,882,732.90	$0.00	$2,510,173.89
RETAINING WALL, CIP CONCRETE									
G	BUILDING SITEWORK								
G10	SITE PREPARATIONS								
G1030	SITE EARTHWORK								
G103001	GRADING								
G1030010105	Fine Grading, Hand	97,009.78	SY	$27.67	$0.00	$2,684,462.96	$0.00	$0.00	$2,684,462.96
G1030010107	Fine Grading, 0.012 T (120G), 2 Passes	24,252.44	SY	$2.95	$0.00	$49,412.88	$22,038.45	$0.00	$71,451.33
G103002	COMMON EXCAVATION								
G1030020257	Cat 215, 0.76m3 (1 CY), Soil, Shallow, Trenching	41,390.84	CY	$10.86	$0.00	$361,595.54	$87,870.78	$0.00	$449,466.32
G1030020282	Soil, 8.05km (5 Mi), Dump Truck, Load/Haul off Spoil From Trench	22,193.51	CY	$10.38	$0.00	$140,807.03	$89,507.76	$0.00	$230,314.79
G103004	FILL & BORROW								
G1030040401	950, 2.29m3 (3 CY), Backfill W/Excavated Material	23,636.03	CY	$5.43	$0.00	$69,623.38	$58,709.64	$0.00	$128,333.02
G103005	COMPACTION								
G1030050516	Compact W/50% Pogosticks, 50% Hand Roller	23,636.03	CY	$24.66	$0.00	$545,885.66	$36,886.91	$0.00	$582,772.57
Marked Up Cost					$0.00	$3,851,787.46	$295,013.53	$0.00	$4,146,800.99
G20	SITE IMPROVEMENTS								
G2020	PARKING LOTS								
G202003	PAVED SURFACES								
G2020030324	304.80mm (12") Structural Slab On Grade	572,964.00	SF	$41.23	$13,363,639.46	$10,048,187.33	$210,234.32	$0.00	$23,622,061.10
G2040	SITE DEVELOPMENT								
G204002	RETAINING WALLS AND FREESTANDING WALLS								
G2040020201	Cont. Footing, Edge Form, 4 Uses	65,481.60	SF	$20.05	$388,184.80	$924,857.90	$0.00	$0.00	$1,313,042.71
G2040020202	Footing, Rebar	560,231.47	lb	$3.39	$936,896.53	$960,638.77	$0.00	$0.00	$1,897,535.30

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G2040020203	Pour & Cure Concrete, Cont. Footing	12,449.59	CY	$618.10	$4,744,358.56	$2,490,884.40	$459,844.92	$0.00	$7,695,087.88
G2040020205	CIP Walls Form & Strip (4 Uses)	545,680.00	SF	$28.77	$1,035,255.70	$14,665,459.99	$0.00	$0.00	$15,700,715.69
G2040020206	Reinf Steel, Retaining Wall	2,011,563.43	lb	$2.99	$3,364,014.52	$2,644,592.82	$0.00	$0.00	$6,008,607.34
G2040020207	Pour & Cure Concrete, Retaining Wall	19,157.75	CY	$603.49	$7,575,165.33	$3,353,804.72	$632,590.18	$0.00	$11,561,560.22
G2040020208	Bush Hammer Finish	218,272.00	SF	$9.77	$0.00	$2,013,475.48	$119,664.62	$0.00	$2,133,140.11
G2040020210	Keyway	27,284.00	LF	$4.19	$22,027.35	$92,317.71	$0.00	$0.00	$114,345.05
Marked Up Cost					$31,429,542.24	$37,194,219.11	$1,422,334.04	$0.00	$70,046,095.39
	Facility Marked Up Cost:				$31,429,542.24	$41,046,006.58	$1,717,347.57	$0.00	$74,192,896.39
	Primary Facilities Total Marked Up Cost:				$0.00	$50,261,952.63	$4,828,365.60	$0.00	$93,678,734.84
	Total Facilities Marked Up Cost:				$38,588,416.61	$50,261,952.63	$4,828,365.60	$0.00	$93,678,734.84

In-Project Lump Sums(s)

Pavement:	0.00
Site Improvements:	0.00
Utilities:	0.00

Estimated Contract Cost:		$93,678,734.84
Contingency:	20.00%	$18,735,746.97
SIOH:	5.70%	$6,407,625.46
Design	0.00%	$0.00
Other	0.00%	$0.00
Total Project Cost:		$118,822,107.27

Out-of-Project Lump Sum(s)

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Project Midpoint: Dec 2025
Area Cost Factor: 1.160
Escalation Rate: 25.6

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
PRIMARY FACILITIES									
UNDERGROUND ELECTRICAL DISTRIBUTION									
D	SERVICES								
D50	ELECTRICAL								
D5010	ELECTRICAL SERVICE & DISTRIBUTION								
D501001	MAIN & SECONDARY TRANSFORMERS								
D5010010156	MV/MV 40 MVA Main Transformer	2.00	EA	$964,945.11	$1,670,087.13	$243,263.60	$16,539.48	$0.00	$1,929,890.22
D501004	SWITCHBOARDS & PANELBOARDS								
D5010040318	Electrical 15kV, 2,000 AMP Main Switchboard	1.00	EA	$1,023,154.55	$782,850.31	$240,304.23	$0.00	$0.00	$1,023,154.55
Marked Up Cost					$2,452,937.45	$483,567.84	$16,539.48	$0.00	$2,953,044.77
G	BUILDING SITEWORK								
G10	SITE PREPARATIONS								
G1020	SITE DEMOLITION & RELOCATIONS								
G102007	SITE CLEANUP								
G1020070401	Dump Charge	910.80	CY	$31.94	$29,092.16	$0.00	$0.00	$0.00	$29,092.16
G1030	SITE EARTHWORK								
G103002	COMMON EXCAVATION								
G1030020222	926, 1.53m3 (2.0 CY), Wheel Loader	17.00	HR	$263.57	$0.00	$2,779.63	$1,700.98	$0.00	$4,480.61
G1030020262	Cat 235, 1.91m3 (2.5 CY), Soil/Sand, Trenching	20,124.94	CY	$4.66	$0.00	$64,961.71	$28,914.10	$0.00	$93,875.81
G1030020287	15.29m3 (20 CY), Semi Dump	36.00	HR	$318.20	$0.00	$4,769.86	$6,685.48	$0.00	$11,455.33
G103004	FILL & BORROW								
G1030040401	950, 2.29m3 (3 CY), Backfill W/Excavated Material	10,600.37	CY	$5.01	$0.00	$28,825.52	$24,307.01	$0.00	$53,132.53
G103005	COMPACTION								
G1030050511	Compact Soil W/Vibrating Plate	10,600.37	CY	$7.04	$0.00	$71,940.13	$2,721.04	$0.00	$74,661.17
G1030050515	Compact With Pogosticks	3,055.99	CY	$38.48	$0.00	$109,572.40	$8,020.40	$0.00	$117,592.80

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
Marked Up Cost					$29,092.16	$282,849.26	$72,349.00	$0.00	$384,290.42
G40	SITE ELECTRICAL UTILITIES								
G4010	ELECTRICAL DISTRIBUTION								
G401003	SWITCHES, CONTROLS & DEVICES								
G4010033021	Sectionalizing switches, overhead line, 69 kV	2.00	EA	$85,887.85	$135,431.24	$32,365.05	$3,979.41	$0.00	$171,775.70
G401006	UNDERGROUND ELECTRIC CONDUCTORS								
G4010062215	Shielded cable, copper, XLP shielding, 15 kV, 1/0, excl splicing & terminations	276,078.00	LF	$84.64	$20,294,137.68	$3,073,962.80	$0.00	$0.00	$23,368,100.48
G401007	DUCTBANKS, MANHOLES, HANDHOLES & RACEWAYS								
G4010070615	Concrete Encasement For Duct Bank	2,841.60	CY	$670.09	$1,741,165.29	$160,108.91	$2,847.49	$0.00	$1,904,121.68
G4010074037	PVC conduit, schedule 40, 6" diameter, in concrete slab, incl terminations, fittings and supports	148,000.00	LF	$93.20	$3,356,268.80	$10,437,420.36	$0.00	$0.00	$13,793,689.16
G4010074212	Hand holes, precast concrete, with concrete cover, 2' x 2' x 3' deep, excludes excv & bckfl	370.00	EA	$3,274.26	$350,609.32	$819,762.60	$41,104.84	$0.00	$1,211,476.76
Marked Up Cost					$25,877,612.33	$14,523,619.71	$47,931.74	$0.00	$40,449,163.78
				Facility Marked Up Cost:	$28,359,641.94	$15,290,036.81	$136,820.23	$0.00	$43,786,498.97

UNDERGROUND ELECTRICAL DISTRIBUTION

G	BUILDING SITEWORK								
G10	SITE PREPARATIONS								
G1020	SITE DEMOLITION & RELOCATIONS								
G102007	SITE CLEANUP								
G1020070401	Dump Charge	135.39	CY	$31.94	$4,324.54	$0.00	$0.00	$0.00	$4,324.54
G1030	SITE EARTHWORK								
G103002	COMMON EXCAVATION								
G1030020220	910, 0.96m3 (1.25 CY), Wheel Loader	3.00	HR	$247.98	$0.00	$490.52	$253.43	$0.00	$743.95

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G1030020262	Cat 235, 1.91m3 (2.5 CY), Soil/Sand, Trenching	4,686.81	CY	$4.66	$0.00	$15,119.05	$6,733.68	$0.00	$21,852.73
G1030020284	6.12m3 (8 CY), Dump Truck	10.00	HR	$265.15	$0.00	$1,932.80	$718.72	$0.00	$2,651.52
G103004	FILL & BORROW								
G1030040401	950, 2.29m3 (3 CY), Backfill W/Excavated Material	2,222.46	CY	$5.01	$0.00	$6,043.52	$5,096.18	$0.00	$11,139.70
G103005	COMPACTION								
G1030050511	Compact Soil W/Vibrating Plate	2,222.46	CY	$7.04	$0.00	$15,082.88	$570.49	$0.00	$15,653.37
G1030050515	Compact With Pogosticks	764.77	CY	$38.48	$0.00	$27,420.80	$2,007.13	$0.00	$29,427.92
Marked Up Cost					$4,324.54	$66,089.57	$15,379.62	$0.00	$85,793.73
G30	SITE CIVIL/MECHANICAL UTILITIES								
G3094	OTHER SITE UTILITY INFRASTRUCTURE								
G309407	UTILITY VAULTS, METER PITS & VALVE BOXES								
G3094070501	Utility vaults, precast concrete, 4' x 6' x 6' high, I.D., 6" thick, excludes excavation & backfill	19.00	EA	$9,213.68	$64,734.43	$99,401.52	$10,924.06	$0.00	$175,060.01
Marked Up Cost					$64,734.43	$99,401.52	$10,924.06	$0.00	$175,060.01
G40	SITE ELECTRICAL UTILITIES								
G4010	ELECTRICAL DISTRIBUTION								
G401003	SWITCHES, CONTROLS & DEVICES								
G4010033026	Sectionalizing switches, 2 fuses up & 2 switch downstream, 15 kV, 200 A	45.00	EA	$282,824.45	$11,991,124.99	$655,392.23	$80,582.84	$0.00	$12,727,100.07
G401005	TOWERS, POLES, CROSSARMS & INSULATORS								
G4010053470	Grounding rod, copper clad, 10' long, 3/4" diameter	270.00	EA	$609.63	$34,784.11	$129,816.83	$0.00	$0.00	$164,600.93
G4010053475	Grounding connection, brazed, 4/0 wire	270.00	EA	$392.72	$24,435.12	$81,599.15	$0.00	$0.00	$106,034.27
G401006	UNDERGROUND ELECTRIC CONDUCTORS								
G4010060503	3/C #6, W/#6 Ground 600 V DB, Wire	3,500.00	LF	$19.76	$24,967.47	$44,200.20	$0.00	$0.00	$69,167.67
G4010062215	Shielded cable, copper, XLP shielding, 15 kV, 1/0, excl splicing & terminations	41,412.00	LF	$84.64	$3,044,146.93	$461,097.76	$0.00	$0.00	$3,505,244.69
G401007	DUCTBANKS, MANHOLES, HANDHOLES & RACEWAYS								
G4010070615	Concrete Encasement For Duct Bank	865.70	CY	$670.09	$530,450.03	$48,777.55	$867.49	$0.00	$580,095.07

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G4010074019	Underground duct banks ready for concrete fill, PVC, type EB, 6 @ 6" diameter, excludes excavation	0.00	LF	$191.09	$0.00	$0.00	$0.00	$0.00	$0.00
G4010074037	PVC conduit, schedule 40, 6" diameter, in concrete slab, incl terminations, fittings and supports	66,000.00	LF	$93.20	$1,496,770.68	$4,654,167.14	$0.00	$0.00	$6,150,937.82
G4010074212	Hand holes, precast concrete, with concrete cover, 2' x 2' x 3' deep, excludes excv & bckfl	55.00	EA	$3,274.26	$52,117.60	$121,856.60	$6,110.18	$0.00	$180,084.38
Marked Up Cost					$17,198,796.93	$6,196,907.45	$87,560.51	$0.00	$23,483,264.90
				Facility Marked Up Cost:	$17,267,855.90	$6,362,398.54	$113,864.19	$0.00	$23,744,118.63
				Primary Facilities Total Marked Up Cost:	$0.00	$21,652,435.35	$250,684.42	$0.00	$67,530,617.60
				Total Facilities Marked Up Cost:	$45,627,497.83	$21,652,435.35	$250,684.42	$0.00	$67,530,617.60

In-Project Lump Sums(s)

Pavement:	0.00
Site Improvements:	0.00
Utilities:	0.00

Estimated Contract Cost:		$67,530,617.60
Contingency:	5.00%	$3,376,530.88
SIOH:	5.70%	$4,041,707.46
Design	4.00%	$2,701,224.70
Other	0.00%	$0.00
Total Project Cost:		$77,650,080.65

Out-of-Project Lump Sum(s)

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Project Midpoint: Dec 2025
Area Cost Factor: 1.160
Escalation Rate: 25.6

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
PRIMARY FACILITIES									
COMMUNICATIONS									
D	SERVICES								
D30	HVAC								
D3050	TERMINAL & PACKAGE UNITS								
D305090	OTHER TERMINAL & PACKAGE UNITS								
D3050909005	4.54Mg (5 Ton) Computer Room A.C. W/Refrigerant Piping	8.00	EA	$94,042.91	$574,643.61	$177,699.67	$0.00	$0.00	$752,343.28
Marked Up Cost					$574,643.61	$177,699.67	$0.00	$0.00	$752,343.28
D50	ELECTRICAL								
D5090	OTHER ELECTRICAL SERVICES								
D509002	EMERGENCY LIGHTING & POWER								
D5090020208	250 KW Emergency Generator	2.00	EA	$122,682.27	$196,543.94	$46,489.52	$2,331.09	$0.00	$245,364.55
Marked Up Cost					$196,543.94	$46,489.52	$2,331.09	$0.00	$245,364.55
G	BUILDING SITEWORK								
G10	SITE PREPARATIONS								
G1030	SITE EARTHWORK								
G103002	COMMON EXCAVATION								
G1030020259	Cat 225, 1.15m3 (1.5 CY), Soil/Sand, Trenching	12,962.96	CY	$7.25	$0.00	$70,073.74	$23,910.64	$0.00	$93,984.38
G103004	FILL & BORROW								
G1030040401	950, 2.29m3 (3 CY), Backfill W/Excavated Material	7,407.41	CY	$5.04	$0.00	$20,252.46	$17,077.81	$0.00	$37,330.27
G1030040405	950, 2.29m3 (3 CY), Delivered & Dumped, Backfill W/Sand	2,129.63	CY	$63.70	$85,491.40	$25,485.85	$24,676.84	$0.00	$135,654.08
G103005	COMPACTION								
G1030050511	Compact Soil W/Vibrating Plate	7,407.41	CY	$7.08	$0.00	$50,544.26	$1,911.77	$0.00	$52,456.03
G1030050515	Compact With Pogosticks	2,129.63	CY	$38.69	$0.00	$76,773.02	$5,619.58	$0.00	$82,392.60

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G103010	TEMPORARY DEWATERING								
G1030101002	50.80mm (2") Dia Contractor's Trash Pump, 283.91 L/min (75 GPM)	150.00	DAY	$194.90	$22,618.87	$6,615.57	$0.00	$0.00	$29,234.43
Marked Up Cost					$108,110.26	$249,744.90	$73,196.63	$0.00	$431,051.79
G40	SITE ELECTRICAL UTILITIES								
G4010	ELECTRICAL DISTRIBUTION								
G401007	DUCTBANKS, MANHOLES, HANDHOLES & RACEWAYS								
G4010070610	50.80mm (2") PVC Conduit	225,000.00	LF	$15.24	$770,760.55	$2,658,813.65	$0.00	$0.00	$3,429,574.20
G4010070615	Concrete Encasement For Duct Bank	3,703.70	CY	$673.73	$2,281,750.27	$209,818.41	$3,731.56	$0.00	$2,495,300.23
G4010074215	Hand holes, precast concrete, with concrete cover, 4' x 4' x 4' deep, excludes excv & bckfl	28.00	EA	$7,596.44	$100,412.97	$106,925.89	$5,361.52	$0.00	$212,700.37
G4030	SITE COMMUNICATION AND SECURITY								
G403001	TELECOMMUNICATIONS SYSTEMS								
G4030010103	100 Pair No. 22 Awg Wire, Comm Cable	225,000.00	LF	$2.51	$368,519.89	$195,316.86	$0.00	$0.00	$563,836.75
G4030010105	El & Com Manhole 0.95m2 x 3.05m Dp (10.5' Sq x 10' Dp), Cable Tray	35.00	EA	$28,094.19	$561,001.28	$380,481.16	$41,814.25	$0.00	$983,296.68
Marked Up Cost					$4,082,444.95	$3,551,355.97	$50,907.32	$0.00	$7,684,708.24
				Facility Marked Up Cost:	$4,961,742.76	$4,025,290.06	$126,435.04	$0.00	$9,113,467.86

MAINTENANCE FACILITY

A	SUBSTRUCTURE								
A10	FOUNDATIONS								
A1010	STANDARD FOUNDATIONS								
A101001	WALL FOUNDATIONS								
A1010010103	1'0" X 3'0" Strip Footing 3000 PSI	18.45	LF	$112.58	$1,078.61	$975.50	$22.92	$0.00	$2,077.03
A1010010116	203.2 mm(8") Masonry Wall Foundation - 610 mm(24") Deep Wall	26.09	LF	$123.13	$944.54	$2,251.20	$16.86	$0.00	$3,212.59
A1010010121	Frost Depth Modification To Foundation Wall	80.18	LF	$105.49	$2,077.97	$6,228.07	$152.20	$0.00	$8,458.23

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
A101002	COLUMN FOUNDATIONS & PILE CAPS								
A1010020201	Spread Footing	0.38	CY	$629.85	$136.83	$98.85	$3.67	$0.00	$239.34
A1010020241	Spread Footing, Reinforcing Steel	0.01	TON	$6,287.74	$31.04	$31.83	$0.00	$0.00	$62.88
A1010020277	Spread Footing Column Bolts	3.00	EA	$57.76	$68.70	$104.59	$0.00	$0.00	$173.29
A1030	SLAB ON GRADE								
A103001	STANDARD SLAB ON GRADE								
A1030010103	152.4 mm(6") Standard Slab On Grade	250.00	SF	$18.48	$2,328.03	$2,239.76	$52.51	$0.00	$4,620.30
A103003	TRENCHES								
A1030030401	152.4 mm(6") Thick Trench Slab 1.12 m(3'8") Wide	2.57	LF	$91.31	$125.93	$104.65	$4.09	$0.00	$234.67
A1030030402	304.8 mm(12") Deep Pit Wall	2.74	LF	$184.97	$108.93	$394.38	$3.50	$0.00	$506.80
A1030030403	610 mm(24") Deep 2.44 m X 2.13 m(8'0" X 7'0") Pit Wall	0.15	LF	$220.54	$17.11	$15.66	$0.31	$0.00	$33.08
A1030030407	Galv. Welded Steel Trench Grate	5.15	SF	$73.32	$292.19	$84.39	$1.00	$0.00	$377.58
Marked Up Cost					$7,209.88	$12,528.87	$257.06	$0.00	$19,995.81
B	SHELL								
B10	SUPERSTRUCTURE								
B1010	FLOOR CONSTRUCTION								
B101001	STRUCTURAL FRAME								
B1010010199	Seismic Modifications	251.00	SF	$0.95	$238.82	$0.00	$0.00	$0.00	$238.82
B1020	ROOF CONSTRUCTION								
B102001	STRUCTURAL FRAME								
B1020010114	Sml Span, Lt Ld, Stl Frm, Mtl Joist	0.33	TON	$15,120.06	$3,209.05	$1,678.98	$101.59	$0.00	$4,989.62
B1020010136	Structural Steel, Lt Load, Columns	0.15	TON	$8,964.28	$1,051.77	$268.22	$24.65	$0.00	$1,344.64
B102003	ROOF DECKS AND SLABS								
B1020030306	1-1/2" Galv. Metal Roof Deck, Open Type, F.P.	310.00	SF	$8.58	$1,606.18	$1,029.98	$22.61	$0.00	$2,658.78
Marked Up Cost					$6,105.81	$2,977.19	$148.85	$0.00	$9,231.85

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
B20	EXTERIOR ENCLOSURE								
B2010	EXTERIOR WALLS								
B201001	EXTERIOR CLOSURE								
B2010010126	203.2 mm(8") Load Bearing Concrete Block Wall w/Furred Interior	797.00	SF	$52.04	$8,707.40	$32,747.08	$23.95	$0.00	$41,478.44
B2010010129	E.I.F.S. (Dryvit)	797.00	SF	$31.90	$1,928.21	$23,341.32	$152.68	$0.00	$25,422.21
B201003	INSULATION & VAPOR RETARDER								
B2010030205	Loose Fill 8" Block Insulation	797.00	SF	$4.67	$1,666.28	$2,056.19	$0.00	$0.00	$3,722.46
B201005	EXTERIOR LOUVERS & SCREENS								
B2010050501	Fixed Blade Exterior Louver With Baked Enamel Finish	14.06	SF	$110.48	$797.72	$755.59	$0.00	$0.00	$1,553.31
B2020	EXTERIOR WINDOWS								
B202001	WINDOWS								
B2020010101	Aluminum Frm Fixed Type Window - 6.35 mm(1/4") Clear	50.42	SF	$197.57	$8,070.86	$1,890.40	$0.00	$0.00	$9,961.26
B2030	EXTERIOR DOORS								
B203001	SOLID DOORS								
B2030010202	910 mm X 2130 mm(3'0" X 7'0") Hollow Metal Door W/Frame	2.00	EA	$7,538.44	$11,660.54	$3,416.34	$0.00	$0.00	$15,076.88
B2030010204	1830 mm X 2130 mm(6'0" X 7'0") Pair Hollow Metal Doors W/Frame and Panic Handles	1.00	EA	$14,515.40	$11,367.22	$3,148.18	$0.00	$0.00	$14,515.40
B203004	OVERHEAD AND ROLL-UP DOORS								
B2030040103	6100 mm X 4270mm(20'0" X 14'0") Metal Overhead Door	1.00	EA	$27,766.87	$16,134.67	$11,395.42	$236.78	$0.00	$27,766.87
Marked Up Cost					$60,332.89	$78,750.53	$413.42	$0.00	$139,496.83
B30	ROOFING								
B3010	ROOF COVERINGS								
B301002	LOW SLOPE ROOF SYSTEMS								
B3010020108	Standing Seam Metal Roof	310.00	SF	$23.12	$4,745.53	$2,421.00	$0.00	$0.00	$7,166.53
B301003	ROOF INSULATION & FILL								

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
B3010030302	Rigid Insulation 1-1/2" Thick	310.00	SF	$3.04	$683.62	$260.14	$0.00	$0.00	$943.76
B301005	GUTTERS & DOWNSPOUTS								
B3010050601	5" Box Gutters With Downspouts	99.21	LF	$28.42	$776.69	$2,042.36	$0.00	$0.00	$2,819.06
Marked Up Cost					$6,205.85	$4,723.50	$0.00	$0.00	$10,929.35
C	INTERIORS								
C10	INTERIOR CONSTRUCTION								
C1010	PARTITIONS								
C101001	FIXED PARTITIONS								
C1010010101	Mtl Stud Partition, 3-5/8"	211.20	SF	$4.73	$266.79	$732.37	$0.00	$0.00	$999.16
C1010010112	Non-Load Brg Partition Of 8 X 6 X 16 Concrete	40.37	SF	$27.82	$447.25	$675.86	$0.00	$0.00	$1,123.11
C1010010113	Non-Load Brg Partition Of 8 X 8 X 16 Concrete	13.59	SF	$26.60	$110.92	$250.59	$0.00	$0.00	$361.52
C1010010127	Wire Mesh Partitions, 4' Wide X 20' High	47.53	SF	$15.00	$482.48	$230.66	$0.00	$0.00	$713.14
C1020	INTERIOR DOORS								
C102001	STANDARD INTERIOR DOORS								
C1020010101	3'0" X 7'0" Hollow Metal Door	1.00	EA	$3,333.74	$2,724.19	$609.55	$0.00	$0.00	$3,333.74
C1020010102	3'0" X 7'0" Hollow Metal Door W/ 8" X 8" Vision Glass	4.00	EA	$3,333.74	$10,896.76	$2,438.22	$0.00	$0.00	$13,334.97
C1030	SPECIALTIES								
C103002	TOILET & BATH ACCESSORIES								
C1030020212	Toilet Accessories For Single Toilet	1.00	EA	$2,806.78	$1,924.55	$882.24	$0.00	$0.00	$2,806.78
C103009	CABINETS								
C1030090212	Wall Mounted Base Cabinet W/Doors	0.69	LF	$5,269.82	$3,508.57	$127.61	$0.00	$0.00	$3,636.18
C1030090220	Plastic Laminated Wall Cabinet - 30" High, 12" Deep	0.69	LF	$862.09	$441.71	$153.13	$0.00	$0.00	$594.84
C1030090226	Plastic Laminated Vanity Cabinet - 21" Deep	0.52	LF	$862.09	$332.88	$115.40	$0.00	$0.00	$448.29
Marked Up Cost					$21,136.09	$6,215.64	$0.00	$0.00	$27,351.72
C30	INTERIOR FINISHES								

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
C3010	WALL FINISHES								
C301003	GYPSUM WALLBOARD FINISHES								
C3010030301	5/8" Gypsum Board On 7/8" Furring Channel	13.59	SF	$8.86	$23.64	$96.77	$0.00	$0.00	$120.41
C3010030313	5/8" FR Gypsum Board/Installed/Taped & Finished	261.90	SF	$4.02	$181.62	$871.81	$0.00	$0.00	$1,053.43
C301004	TILE & TERRAZZO WALL FINISHES								
C3010040401	4-1/4" X 4-1/4" Ceramic Tile To Walls	3.27	SF	$32.93	$61.54	$46.15	$0.00	$0.00	$107.69
C301090	OTHER WALL FINISHES								
C3010900501	Paint To Gypsum Board Walls Using Roller	261.90	SF	$2.66	$302.79	$395.11	$0.00	$0.00	$697.90
C3020	FLOOR FINISHES								
C302004	RESILIENT FLOOR FINISHES								
C3020040404	Sheet Vinyl Resilient Flooring	57.39	SF	$9.69	$147.45	$408.73	$0.00	$0.00	$556.17
C302090	OTHER FLOORING & FLOOR FINISHES								
C3020909001	Concrete Floor Sealer	193.61	SF	$0.53	$56.17	$46.14	$0.00	$0.00	$102.31
C3030	CEILING FINISHES								
C303001	ACOUSTICAL CEILING TILES & PANELS								
C3030010402	2' X 2' Or 2' X 4' Fiberglass Acoustical Ceiling Tiles	54.29	SF	$11.09	$473.76	$128.39	$0.00	$0.00	$602.15
C303002	GYPSUM WALLBOARD CEILING FINISHES								
C3030020301	5/8" Gypsum Wallboard Ceiling, 1 Layer, Fire Rated	3.10	SF	$5.19	$2.59	$13.49	$0.00	$0.00	$16.08
C303005	SUSPENSIONS SYSTEMS								
C3030050703	T-Bar Ceiling Suspension System 2' X 4' Grid	112.29	SF	$5.31	$363.02	$233.64	$0.00	$0.00	$596.67
C3030050704	Suspension System For Gypsum Board Ceiling	3.10	SF	$15.82	$8.36	$40.66	$0.00	$0.00	$49.03
C303006	METAL STRIP CEILINGS								
C3030060801	Metal Slat Ceiling, Aluminum	58.00	SF	$44.84	$2,359.38	$241.35	$0.00	$0.00	$2,600.73
C303090	OTHER CEILING & CEILING FINISHES								
C3030900603	Paint Exposed Steel Joists And Roof Deck	135.61	SF	$6.53	$246.79	$639.28	$0.00	$0.00	$886.07
Marked Up Cost					$4,227.12	$3,161.52	$0.00	$0.00	$7,388.64

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Project Midpoint: Jan 2026
Area Cost Factor: 1.160
Escalation Rate: 26.283

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
D	SERVICES								
D10	CONVEYING								
D1010	ELEVATORS AND LIFTS								
D101004	WHEELCHAIR LIFT								
D1010040303	5 Ton Auto Lift, 10000 lb Frame Lift, Double Post	1.00	EA	$18,671.97	$16,325.14	$2,346.83	$0.00	$0.00	$18,671.97
Marked Up Cost					$16,325.14	$2,346.83	$0.00	$0.00	$18,671.97
D20	PLUMBING								
D2010	PLUMBING FIXTURES								
D201001	WATERCLOSETS								
D2010010101	Floor Mounted Water Closet	1.00	EA	$1,174.84	$426.06	$748.78	$0.00	$0.00	$1,174.84
D201003	LAVATORIES								
D2010030302	Wall Hung 18" By 15" White Single Bowl Lavatory	2.00	EA	$5,122.18	$4,329.11	$5,915.25	$0.00	$0.00	$10,244.36
D2010030310	Wash Fountain - Precast Terrazzo - 54" Dia	1.00	EA	$25,633.14	$23,122.82	$2,510.33	$0.00	$0.00	$25,633.14
D201004	SINKS								
D2010040403	S.S. Kitchen Sink, Single Bowl 25 X 22	1.00	EA	$5,217.97	$2,654.84	$2,563.13	$0.00	$0.00	$5,217.97
D2010040407	Janitor Sink - Floor Type	1.00	EA	$4,113.44	$3,211.50	$901.94	$0.00	$0.00	$4,113.44
D201005	SHOWERS/TUBS								
D2010050506	Emergency Shower And Eyewash	1.00	EA	$3,015.38	$2,023.25	$992.14	$0.00	$0.00	$3,015.38
D201006	DRINKING FOUNTAINS & COOLERS								
D2010060601	8 GPH Electric Water Cooler - Wall Mounted	1.00	EA	$3,347.24	$2,355.10	$992.14	$0.00	$0.00	$3,347.24
D2020	DOMESTIC WATER DISTRIBUTION								
D202001	PIPES & FITTINGS								
D2020010101	Copper Pipe & Fittings (1/2" to 4" Dia. Piping)	1.00	EA	$6,356.89	$2,291.39	$4,065.51	$0.00	$0.00	$6,356.89
D202002	VALVES & HYDRANTS								
D2020020201	Valves & Hydrants	1.00	EA	$1,583.30	$1,440.40	$142.89	$0.00	$0.00	$1,583.30
D202003	DOMESTIC WATER EQUIPMENT								

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
D2020030152	Domestic Hot Water Heater, Electric (30 Gal)	1.00	EA	$2,761.56	$1,712.80	$1,048.76	$0.00	$0.00	$2,761.56
D202004	INSULATION & IDENTIFICATION								
D2020040401	Fiberglass 1-1/2" Pipe Insulation With Vapor Barrier	1.00	EA	$869.31	$312.07	$557.23	$0.00	$0.00	$869.31
D2030	SANITARY WASTE								
D203001	WASTE PIPE & FITTINGS								
D2030010101	Waste Pipe & Fittings	1.00	EA	$4,582.17	$1,776.57	$2,805.61	$0.00	$0.00	$4,582.17
D203002	VENT PIPE & FITTINGS								
D2030020201	C.I. No Hub Vent Pipe Systm	1.00	EA	$374.06	$98.94	$275.12	$0.00	$0.00	$374.06
D203003	FLOOR DRAINS								
D2030030304	Medium Duty And Heavy Duty Cast Iron Floor Drains, Adtl	1.00	EA	$1,927.40	$1,539.99	$387.41	$0.00	$0.00	$1,927.40
Marked Up Cost					$47,294.84	$23,906.24	$0.00	$0.00	$71,201.07
D40	FIRE PROTECTION								
D4010	FIRE ALARM AND DETECTION SYSTEMS								
D401001	FIRE ALARM DISTRIBUTION								
D4010010102	Fire Alarm System - Rate Of Rise Heat Detectors	1.00	OUT	$2,615.37	$406.37	$2,209.00	$0.00	$0.00	$2,615.37
D4010010104	Fire Alarm Duct Smoke Detector	1.00	EA	$3,141.94	$873.91	$2,268.02	$0.00	$0.00	$3,141.94
D4010010112	8 Zone Fire Alarm Panel And Remote Annunciator	1.00	EA	$8,232.40	$2,044.66	$6,187.75	$0.00	$0.00	$8,232.40
Marked Up Cost					$3,324.94	$10,664.77	$0.00	$0.00	$13,989.71
D50	ELECTRICAL								
D5010	ELECTRICAL SERVICE & DISTRIBUTION								
D501001	MAIN & SECONDARY TRANSFORMERS								
D5010010153	MV/LV 500 kVA Main Transformer, 800A Distribution	1.00	EA	$98,479.75	$76,132.99	$21,222.68	$1,124.08	$0.00	$98,479.75
D5010010207	Underground 800 Amp Secondary	1.00	EA	$106,746.56	$59,125.90	$47,460.50	$160.16	$0.00	$106,746.56
D5010010271	Underground 125 Amp Secondary	0.00	EA	$88.16	$0.00	$0.00	$0.00	$0.00	$0.00
D501004	SWITCHBOARDS & PANELBOARDS								

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
D5010040307	Ungrd 800 Amp Main Switchboard	1.00	EA	$196,487.18	$158,744.56	$37,742.63	$0.00	$0.00	$196,487.18
D5010040581	Panel board 120/208V 100A Mlo 24 Cir W/Bkr	1.00	EA	$11,522.98	$4,149.26	$7,373.72	$0.00	$0.00	$11,522.98
D5010040590	Panel board 277/480V 100A Mlo 24 Cir W/Bkr	1.00	EA	$18,662.42	$9,769.39	$8,893.03	$0.00	$0.00	$18,662.42
D5020	LIGHTING & BRANCH WIRING								
D502001	BRANCH WIRING								
D5020010101	120 Volt, 20 Amp Duplex Receptacle - Stud Partition	2.00	EA	$1,449.89	$702.93	$2,196.84	$0.00	$0.00	$2,899.77
D5020010108	Duplex GFI Receptacle Long Run	2.00	EA	$2,799.50	$1,451.00	$4,148.01	$0.00	$0.00	$5,599.01
D5020010109	120 Volt, 20 Amp Duplex Ground Fault Receptacle	1.00	EA	$1,600.21	$381.23	$1,218.99	$0.00	$0.00	$1,600.21
D5020010156	120 Volt 20 Amp Single Pole Switch	4.00	EA	$1,394.81	$1,249.15	$4,330.09	$0.00	$0.00	$5,579.24
D5020010157	120 Volt 20 Amp 3-Way Switch	2.00	EA	$1,459.48	$662.68	$2,256.28	$0.00	$0.00	$2,918.96
D502002	LIGHTING EQUIPMENT								
D5020020202	2' X 4' Lay-In Fluorescent Fixture	1.00	EA	$1,927.62	$467.87	$1,459.76	$0.00	$0.00	$1,927.62
D5020020207	2' X 4' Lay-In Fluorescent Fixture With Emergency Unit	1.00	EA	$1,927.62	$467.87	$1,459.76	$0.00	$0.00	$1,927.62
D5020020272	Exit Light With Battery Backup	1.00	EA	$2,553.32	$1,053.29	$1,500.04	$0.00	$0.00	$2,553.32
D502090	OTHER LIGHTING AND BRANCH WIRING								
D5020909010	4-Pair Telephone Outlet	4.00	EA	$1,743.61	$1,140.00	$5,834.44	$0.00	$0.00	$6,974.44
D5020909013	Fire Alarm Duct Smoke Detector	2.00	EA	$2,336.93	$1,667.84	$3,006.01	$0.00	$0.00	$4,673.85
D502095	RENOVATE LIGHTING & BRANCH WIRING								
D5020959156	Renovate Receptacle Duplex 15A 120V GFI	1.00	EA	$118.39	$39.61	$78.78	$0.00	$0.00	$118.39
D5020959176	Renovate 30A 3P Fused Disc. Sw. NEMA 1 240V	3.00	EA	$893.79	$687.26	$1,994.10	$0.00	$0.00	$2,681.36
D5020959206	Replace Recessed Square Incandescent	1.00	EA	$655.85	$269.77	$386.08	$0.00	$0.00	$655.85
D5020959209	Surface Mtd Incandescent Cylinder	1.00	EA	$531.36	$265.48	$265.88	$0.00	$0.00	$531.36
D5020959222	4', 2-Lamp Fluorescent Strip	1.00	EA	$395.41	$129.53	$265.88	$0.00	$0.00	$395.41
D5020959224	4', 1 Lamp Recess Fluorescent	1.00	EA	$490.92	$117.76	$373.16	$0.00	$0.00	$490.92
D5020959225	4', 2 Lamp Suspnsn Mtd Ind Fluorescent	3.00	EA	$606.53	$700.11	$1,119.49	$0.00	$0.00	$1,819.60
D5020959281	Fire Alarm Manual Pull Station	2.00	EA	$579.38	$389.66	$769.09	$0.00	$0.00	$1,158.75

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
D5030	COMMUNICATIONS & SECURITY								
D503001	TELECOMMUNICATIONS SYSTEMS								
D5030010303	4-Pair Telephone Outlet	1.00	EA	$1,963.20	$468.41	$1,494.79	$0.00	$0.00	$1,963.20
D503002	PUBLIC ADDRESS SYSTEMS								
D5030020401	Sound And Public Address	251.00	SF	$3.73	$454.46	$482.50	$0.00	$0.00	$936.96
D503005	SECURITY SYSTEMS								
D5030050801	Card Reader Security System	1.00	OUT	$2,600.85	$973.54	$1,627.31	$0.00	$0.00	$2,600.85
D5030050803	Intrusion Detection System	1.00	OUT	$9,942.40	$1,800.56	$8,141.84	$0.00	$0.00	$9,942.40
D503007	CLOCK & PROGRAM SYSTEMS								
D5030070601	Clock System	1.00	EA	$2,252.16	$684.31	$1,567.85	$0.00	$0.00	$2,252.16
D5090	OTHER ELECTRICAL SERVICES								
D509003	GROUNDING SYSTEMS								
D5090030302	Building Grounding	1.00	EA	$2,173.32	$634.38	$1,538.94	$0.00	$0.00	$2,173.32
D509004	LIGHTNING PROTECTION								
D5090040401	Lightning Protection System	1.00	EA	$1,550.21	$431.46	$1,118.75	$0.00	$0.00	$1,550.21
Marked Up Cost					$325,212.23	$171,327.22	$1,284.25	$0.00	$497,823.69
E	EQUIPMENT & FURNISHINGS								
E20	FURNISHINGS								
E2020	MOVEABLE FURNISHINGS								
E202090	OTHER MOVEABLE FURNISHINGS								
E2020909004	Maintenance Facility Closed Office Furnishings	31.00	SF	$27.29	$846.13	$0.00	$0.00	$0.00	$846.13
Marked Up Cost					$846.13	$0.00	$0.00	$0.00	$846.13
F	SPECIAL CONSTRUCTION & DEMOLITION								
F10	SPECIAL CONSTRUCTION								
F1010	SPECIAL STRUCTURES								

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
F101090	OTHER SPECIAL CONSTRUCTION								
F1010909016	Garage Vehicle Exhaust System	154.51	CFM	$6.84	$418.15	$639.37	$0.00	$0.00	$1,057.52
Marked Up Cost					$418.15	$639.37	$0.00	$0.00	$1,057.52
				Facility Marked Up Cost:	$498,639.06	$317,241.66	$2,103.57	$0.00	$817,984.29

MAINTENANCE FACILITY

A	SUBSTRUCTURE								
A10	FOUNDATIONS								
A1010	STANDARD FOUNDATIONS								
A101001	WALL FOUNDATIONS								
A1010010103	1'0" X 3'0" Strip Footing 3000 PSI	18.45	LF	$112.58	$1,078.61	$975.50	$22.92	$0.00	$2,077.03
A1010010116	203.2 mm(8") Masonry Wall Foundation - 610 mm(24") Deep Wall	26.09	LF	$123.13	$944.54	$2,251.20	$16.86	$0.00	$3,212.59
A1010010121	Frost Depth Modification To Foundation Wall	80.18	LF	$105.49	$2,077.97	$6,228.07	$152.20	$0.00	$8,458.23
A101002	COLUMN FOUNDATIONS & PILE CAPS								
A1010020201	Spread Footing	0.38	CY	$629.85	$136.83	$98.85	$3.67	$0.00	$239.34
A1010020241	Spread Footing, Reinforcing Steel	0.01	TON	$6,287.74	$31.04	$31.83	$0.00	$0.00	$62.88
A1010020277	Spread Footing Column Bolts	3.00	EA	$57.76	$68.70	$104.59	$0.00	$0.00	$173.29
A1030	SLAB ON GRADE								
A103001	STANDARD SLAB ON GRADE								
A1030010103	152.4 mm(6") Standard Slab On Grade	250.00	SF	$18.48	$2,328.03	$2,239.76	$52.51	$0.00	$4,620.30
A103003	TRENCHES								
A1030030401	152.4 mm(6") Thick Trench Slab 1.12 m(3'8") Wide	2.57	LF	$91.31	$125.93	$104.65	$4.09	$0.00	$234.67
A1030030402	304.8 mm(12") Deep Pit Wall	2.74	LF	$184.97	$108.93	$394.38	$3.50	$0.00	$506.80
A1030030403	610 mm(24") Deep 2.44 m X 2.13 m(8'0" X 7'0") Pit Wall	0.15	LF	$220.54	$17.11	$15.66	$0.31	$0.00	$33.08
A1030030407	Galv. Welded Steel Trench Grate	5.15	SF	$73.32	$292.19	$84.39	$1.00	$0.00	$377.58

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
Marked Up Cost					$7,209.88	$12,528.87	$257.06	$0.00	$19,995.81
B	SHELL								
B10	SUPERSTRUCTURE								
B1010	FLOOR CONSTRUCTION								
B101001	STRUCTURAL FRAME								
B1010010199	Seismic Modifications	251.00	SF	$0.95	$238.82	$0.00	$0.00	$0.00	$238.82
B1020	ROOF CONSTRUCTION								
B102001	STRUCTURAL FRAME								
B1020010114	Sml Span, Lt Ld, Stl Frm, Mtl Joist	0.33	TON	$15,120.06	$3,209.05	$1,678.98	$101.59	$0.00	$4,989.62
B1020010136	Structural Steel, Lt Load, Columns	0.15	TON	$8,964.28	$1,051.77	$268.22	$24.65	$0.00	$1,344.64
B102003	ROOF DECKS AND SLABS								
B1020030306	1-1/2" Galv. Metal Roof Deck, Open Type, F.P.	310.00	SF	$8.58	$1,606.18	$1,029.98	$22.61	$0.00	$2,658.78
Marked Up Cost					$6,105.81	$2,977.19	$148.85	$0.00	$9,231.85
B20	EXTERIOR ENCLOSURE								
B2010	EXTERIOR WALLS								
B201001	EXTERIOR CLOSURE								
B2010010126	203.2 mm(8") Load Bearing Concrete Block Wall w/Furred Interior	797.00	SF	$52.04	$8,707.40	$32,747.08	$23.95	$0.00	$41,478.44
B2010010129	E.I.F.S. (Dryvit)	797.00	SF	$31.90	$1,928.21	$23,341.32	$152.68	$0.00	$25,422.21
B201003	INSULATION & VAPOR RETARDER								
B2010030205	Loose Fill 8" Block Insulation	797.00	SF	$4.67	$1,666.28	$2,056.19	$0.00	$0.00	$3,722.46
B201005	EXTERIOR LOUVERS & SCREENS								
B2010050501	Fixed Blade Exterior Louver With Baked Enamel Finish	14.06	SF	$110.48	$797.72	$755.59	$0.00	$0.00	$1,553.31
B2020	EXTERIOR WINDOWS								
B202001	WINDOWS								
B2020010101	Aluminum Frm Fixed Type Window - 6.35 mm(1/4")	50.42	SF	$197.57	$8,070.86	$1,890.40	$0.00	$0.00	$9,961.26

Assembly Detail Report

Assembly	Aluminum Frm Fixed Type Window - 6.35 mm(1/4") Clear	Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
B2030	EXTERIOR DOORS								
B203001	SOLID DOORS								
B2030010202	910 mm X 2130 mm(3'0" X 7'0") Hollow Metal Door W/Frame	2.00	EA	$7,538.44	$11,660.54	$3,416.34	$0.00	$0.00	$15,076.88
B2030010204	1830 mm X 2130 mm(6'0" X 7'0") Pair Hollow Metal Doors W/Frame and Panic Handles	1.00	EA	$14,515.40	$11,367.22	$3,148.18	$0.00	$0.00	$14,515.40
B203004	OVERHEAD AND ROLL-UP DOORS								
B2030040103	6100 mm X 4270mm(20'0" X 14'0") Metal Overhead Door	1.00	EA	$27,766.87	$16,134.67	$11,395.42	$236.78	$0.00	$27,766.87
Marked Up Cost					$60,332.89	$78,750.53	$413.42	$0.00	$139,496.83
B30	ROOFING								
B3010	ROOF COVERINGS								
B301002	LOW SLOPE ROOF SYSTEMS								
B3010020108	Standing Seam Metal Roof	310.00	SF	$23.12	$4,745.53	$2,421.00	$0.00	$0.00	$7,166.53
B301003	ROOF INSULATION & FILL								
B3010030302	Rigid Insulation 1-1/2" Thick	310.00	SF	$3.04	$683.62	$260.14	$0.00	$0.00	$943.76
B301005	GUTTERS & DOWNSPOUTS								
B3010050601	5" Box Gutters With Downspouts	99.21	LF	$28.42	$776.69	$2,042.36	$0.00	$0.00	$2,819.06
Marked Up Cost					$6,205.85	$4,723.50	$0.00	$0.00	$10,929.35
C	INTERIORS								
C10	INTERIOR CONSTRUCTION								
C1010	PARTITIONS								
C101001	FIXED PARTITIONS								
C1010010101	Mtl Stud Partition, 3-5/8"	211.20	SF	$4.73	$266.79	$732.37	$0.00	$0.00	$999.16
C1010010112	Non-Load Brg Partition Of 8 X 6 X 16 Concrete	40.37	SF	$27.82	$447.25	$675.86	$0.00	$0.00	$1,123.11
C1010010113	Non-Load Brg Partition Of 8 X 8 X 16 Concrete	13.59	SF	$26.60	$110.92	$250.59	$0.00	$0.00	$361.52
C1010010127	Wire Mesh Partitions, 4' Wide X 20' High	47.53	SF	$15.00	$482.48	$230.66	$0.00	$0.00	$713.14

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
C1020	INTERIOR DOORS								
C102001	STANDARD INTERIOR DOORS								
C1020010101	3'0" X 7'0" Hollow Metal Door	1.00	EA	$3,333.74	$2,724.19	$609.55	$0.00	$0.00	$3,333.74
C1020010102	3'0" X 7'0" Hollow Metal Door W/ 8" X 8" Vision Glass	4.00	EA	$3,333.74	$10,896.76	$2,438.22	$0.00	$0.00	$13,334.97
C1030	SPECIALTIES								
C103002	TOILET & BATH ACCESSORIES								
C1030020212	Toilet Accessories For Single Toilet	1.00	EA	$2,806.78	$1,924.55	$882.24	$0.00	$0.00	$2,806.78
C103009	CABINETS								
C1030090212	Wall Mounted Base Cabinet W/Doors	0.69	LF	$5,269.82	$3,508.57	$127.61	$0.00	$0.00	$3,636.18
C1030090220	Plastic Laminated Wall Cabinet - 30" High, 12" Deep	0.69	LF	$862.09	$441.71	$153.13	$0.00	$0.00	$594.84
C1030090226	Plastic Laminated Vanity Cabinet - 21" Deep	0.52	LF	$862.09	$332.88	$115.40	$0.00	$0.00	$448.29
Marked Up Cost					$21,136.09	$6,215.64	$0.00	$0.00	$27,351.72
C30	INTERIOR FINISHES								
C3010	WALL FINISHES								
C301003	GYPSUM WALLBOARD FINISHES								
C3010030301	5/8" Gypsum Board On 7/8" Furring Channel	13.59	SF	$8.86	$23.64	$96.77	$0.00	$0.00	$120.41
C3010030313	5/8" FR Gypsum Board/Installed/Taped & Finished	261.90	SF	$4.02	$181.62	$871.81	$0.00	$0.00	$1,053.43
C301004	TILE & TERRAZZO WALL FINISHES								
C3010040401	4-1/4" X 4-1/4" Ceramic Tile To Walls	3.27	SF	$32.93	$61.54	$46.15	$0.00	$0.00	$107.69
C301090	OTHER WALL FINISHES								
C3010900501	Paint To Gypsum Board Walls Using Roller	261.90	SF	$2.66	$302.79	$395.11	$0.00	$0.00	$697.90
C3020	FLOOR FINISHES								
C302004	RESILIENT FLOOR FINISHES								
C3020040404	Sheet Vinyl Resilient Flooring	57.39	SF	$9.69	$147.45	$408.73	$0.00	$0.00	$556.17
C302090	OTHER FLOORING & FLOOR FINISHES								

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
C3020909001	Concrete Floor Sealer	193.61	SF	$0.53	$56.17	$46.14	$0.00	$0.00	$102.31
C3030	CEILING FINISHES								
C303001	ACOUSTICAL CEILING TILES & PANELS								
C3030010402	2' X 2' Or 2' X 4' Fiberglass Acoustical Ceiling Tiles	54.29	SF	$11.09	$473.76	$128.39	$0.00	$0.00	$602.15
C303002	GYPSUM WALLBOARD CEILING FINISHES								
C3030020301	5/8" Gypsum Wallboard Ceiling, 1 Layer, Fire Rated	3.10	SF	$5.19	$2.59	$13.49	$0.00	$0.00	$16.08
C303005	SUSPENSIONS SYSTEMS								
C3030050703	T-Bar Ceiling Suspension System 2' X 4' Grid	112.29	SF	$5.31	$363.02	$233.64	$0.00	$0.00	$596.67
C3030050704	Suspension System For Gypsum Board Ceiling	3.10	SF	$15.82	$8.36	$40.66	$0.00	$0.00	$49.03
C303006	METAL STRIP CEILINGS								
C3030060801	Metal Slat Ceiling, Aluminum	58.00	SF	$44.84	$2,359.38	$241.35	$0.00	$0.00	$2,600.73
C303090	OTHER CEILING & CEILING FINISHES								
C3030900603	Paint Exposed Steel Joists And Roof Deck	135.61	SF	$6.53	$246.79	$639.28	$0.00	$0.00	$886.07
Marked Up Cost					$4,227.12	$3,161.52	$0.00	$0.00	$7,388.64
D	SERVICES								
D10	CONVEYING								
D1010	ELEVATORS AND LIFTS								
D101004	WHEELCHAIR LIFT								
D1010040303	5 Ton Auto Lift, 10000 lb Frame Lift, Double Post	1.00	EA	$18,671.97	$16,325.14	$2,346.83	$0.00	$0.00	$18,671.97
Marked Up Cost					$16,325.14	$2,346.83	$0.00	$0.00	$18,671.97
D20	PLUMBING								
D2010	PLUMBING FIXTURES								
D201001	WATERCLOSETS								
D2010010101	Floor Mounted Water Closet	1.00	EA	$1,174.84	$426.06	$748.78	$0.00	$0.00	$1,174.84
D201003	LAVATORIES								

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
D2010030302	Wall Hung 18" By 15" White Single Bowl Lavatory	2.00	EA	$5,122.18	$4,329.11	$5,915.25	$0.00	$0.00	$10,244.36
D2010030310	Wash Fountain - Precast Terrazzo - 54" Dia	1.00	EA	$25,633.14	$23,122.82	$2,510.33	$0.00	$0.00	$25,633.14
D201004	SINKS								
D2010040403	S.S. Kitchen Sink, Single Bowl 25 X 22	1.00	EA	$5,217.97	$2,654.84	$2,563.13	$0.00	$0.00	$5,217.97
D2010040407	Janitor Sink - Floor Type	1.00	EA	$4,113.44	$3,211.50	$901.94	$0.00	$0.00	$4,113.44
D201005	SHOWERS/TUBS								
D2010050506	Emergency Shower And Eyewash	1.00	EA	$3,015.38	$2,023.25	$992.14	$0.00	$0.00	$3,015.38
D201006	DRINKING FOUNTAINS & COOLERS								
D2010060601	8 GPH Electric Water Cooler - Wall Mounted	1.00	EA	$3,347.24	$2,355.10	$992.14	$0.00	$0.00	$3,347.24
D2020	DOMESTIC WATER DISTRIBUTION								
D202001	PIPES & FITTINGS								
D2020010101	Copper Pipe & Fittings (1/2" to 4" Dia. Piping)	1.00	EA	$6,356.89	$2,291.39	$4,065.51	$0.00	$0.00	$6,356.89
D202002	VALVES & HYDRANTS								
D2020020201	Valves & Hydrants	1.00	EA	$1,583.30	$1,440.40	$142.89	$0.00	$0.00	$1,583.30
D202003	DOMESTIC WATER EQUIPMENT								
D2020030152	Domestic Hot Water Heater, Electric (30 Gal)	1.00	EA	$2,761.56	$1,712.80	$1,048.76	$0.00	$0.00	$2,761.56
D202004	INSULATION & IDENTIFICATION								
D2020040401	Fiberglass 1-1/2" Pipe Insulation With Vapor Barrier	1.00	EA	$869.31	$312.07	$557.23	$0.00	$0.00	$869.31
D2030	SANITARY WASTE								
D203001	WASTE PIPE & FITTINGS								
D2030010101	Waste Pipe & Fittings	1.00	EA	$4,582.17	$1,776.57	$2,805.61	$0.00	$0.00	$4,582.17
D203002	VENT PIPE & FITTINGS								
D2030020201	C.I. No Hub Vent Pipe Systm	1.00	EA	$374.06	$98.94	$275.12	$0.00	$0.00	$374.06
D203003	FLOOR DRAINS								
D2030030304	Medium Duty And Heavy Duty Cast Iron Floor Drains, Adtl	1.00	EA	$1,927.40	$1,539.99	$387.41	$0.00	$0.00	$1,927.40
Marked Up Cost					$47,294.84	$23,906.24	$0.00	$0.00	$71,201.07

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Area Cost Factor: 1.160
2022 Cost Book

Project Midpoint: Jan 2026
Escalation Rate: 26.283
PACES 1.5.06.4

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
D40	FIRE PROTECTION								
D4010	FIRE ALARM AND DETECTION SYSTEMS								
D401001	FIRE ALARM DISTRIBUTION								
D4010010102	Fire Alarm System - Rate Of Rise Heat Detectors	1.00	OUT	$2,615.37	$406.37	$2,209.00	$0.00	$0.00	$2,615.37
D4010010104	Fire Alarm Duct Smoke Detector	1.00	EA	$3,141.94	$873.91	$2,268.02	$0.00	$0.00	$3,141.94
D4010010112	8 Zone Fire Alarm Panel And Remote Annunciator	1.00	EA	$8,232.40	$2,044.66	$6,187.75	$0.00	$0.00	$8,232.40
Marked Up Cost					$3,324.94	$10,664.77	$0.00	$0.00	$13,989.71
D50	ELECTRICAL								
D5010	ELECTRICAL SERVICE & DISTRIBUTION								
D501001	MAIN & SECONDARY TRANSFORMERS								
D5010010153	MV/LV 500 kVA Main Transformer, 800A Distribution	1.00	EA	$98,479.75	$76,132.99	$21,222.68	$1,124.08	$0.00	$98,479.75
D5010010207	Underground 800 Amp Secondary	1.00	EA	$106,746.56	$59,125.90	$47,460.50	$160.16	$0.00	$106,746.56
D5010010271	Underground 125 Amp Secondary	0.00	EA	$88.16	$0.00	$0.00	$0.00	$0.00	$0.00
D501004	SWITCHBOARDS & PANELBOARDS								
D5010040307	Ungrd 800 Amp Main Switchboard	1.00	EA	$196,487.18	$158,744.56	$37,742.63	$0.00	$0.00	$196,487.18
D5010040581	Panel board 120/208V 100A Mlo 24 Cir W/Bkr	1.00	EA	$11,522.98	$4,149.26	$7,373.72	$0.00	$0.00	$11,522.98
D5010040590	Panel board 277/480V 100A Mlo 24 Cir W/Bkr	1.00	EA	$18,662.42	$9,769.39	$8,893.03	$0.00	$0.00	$18,662.42
D5020	LIGHTING & BRANCH WIRING								
D502001	BRANCH WIRING								
D5020010101	120 Volt, 20 Amp Duplex Receptacle - Stud Partition	2.00	EA	$1,449.89	$702.93	$2,196.84	$0.00	$0.00	$2,899.77
D5020010108	Duplex GFI Receptacle Long Run	2.00	EA	$2,799.50	$1,451.00	$4,148.01	$0.00	$0.00	$5,599.01
D5020010109	120 Volt, 20 Amp Duplex Ground Fault Receptacle	1.00	EA	$1,600.21	$381.23	$1,218.99	$0.00	$0.00	$1,600.21
D5020010156	120 Volt 20 Amp Single Pole Switch	4.00	EA	$1,394.81	$1,249.15	$4,330.09	$0.00	$0.00	$5,579.24
D5020010157	120 Volt 20 Amp 3-Way Switch	2.00	EA	$1,459.48	$662.68	$2,256.28	$0.00	$0.00	$2,918.96
D502002	LIGHTING EQUIPMENT								
D5020020202	2' X 4' Lay-In Fluorescent Fixture	1.00	EA	$1,927.62	$467.87	$1,459.76	$0.00	$0.00	$1,927.62

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
D5020020207	2' X 4' Lay-In Fluorescent Fixture With Emergency Unit	1.00	EA	$1,927.62	$467.87	$1,459.76	$0.00	$0.00	$1,927.62
D5020020272	Exit Light With Battery Backup	1.00	EA	$2,553.32	$1,053.29	$1,500.04	$0.00	$0.00	$2,553.32
D502090	OTHER LIGHTING AND BRANCH WIRING								
D5020909010	4-Pair Telephone Outlet	4.00	EA	$1,743.61	$1,140.00	$5,834.44	$0.00	$0.00	$6,974.44
D5020909013	Fire Alarm Duct Smoke Detector	2.00	EA	$2,336.93	$1,667.84	$3,006.01	$0.00	$0.00	$4,673.85
D502095	RENOVATE LIGHTING & BRANCH WIRING								
D5020959156	Renovate Receptacle Duplex 15A 120V GFI	1.00	EA	$118.39	$39.61	$78.78	$0.00	$0.00	$118.39
D5020959176	Renovate 30A 3P Fused Disc. Sw. NEMA 1 240V	3.00	EA	$893.79	$687.26	$1,994.10	$0.00	$0.00	$2,681.36
D5020959206	Replace Recessed Square Incandescent	1.00	EA	$655.85	$269.77	$386.08	$0.00	$0.00	$655.85
D5020959209	Surface Mtd Incandescent Cylinder	1.00	EA	$531.36	$265.48	$265.88	$0.00	$0.00	$531.36
D5020959222	4', 2-Lamp Fluorescent Strip	1.00	EA	$395.41	$129.53	$265.88	$0.00	$0.00	$395.41
D5020959224	4', 1 Lamp Recess Fluorescent	1.00	EA	$490.92	$117.76	$373.16	$0.00	$0.00	$490.92
D5020959225	4', 2 Lamp Suspnsn Mtd Ind Fluorescent	3.00	EA	$606.53	$700.11	$1,119.49	$0.00	$0.00	$1,819.60
D5020959281	Fire Alarm Manual Pull Station	2.00	EA	$579.38	$389.66	$769.09	$0.00	$0.00	$1,158.75
D5030	COMMUNICATIONS & SECURITY								
D503001	TELECOMMUNICATIONS SYSTEMS								
D5030010303	4-Pair Telephone Outlet	1.00	EA	$1,963.20	$468.41	$1,494.79	$0.00	$0.00	$1,963.20
D503002	PUBLIC ADDRESS SYSTEMS								
D5030020401	Sound And Public Address	251.00	SF	$3.73	$454.46	$482.50	$0.00	$0.00	$936.96
D503005	SECURITY SYSTEMS								
D5030050801	Card Reader Security System	1.00	OUT	$2,600.85	$973.54	$1,627.31	$0.00	$0.00	$2,600.85
D5030050803	Intrusion Detection System	1.00	OUT	$9,942.40	$1,800.56	$8,141.84	$0.00	$0.00	$9,942.40
D503007	CLOCK & PROGRAM SYSTEMS								
D5030070601	Clock System	1.00	EA	$2,252.16	$684.31	$1,567.85	$0.00	$0.00	$2,252.16
D5090	OTHER ELECTRICAL SERVICES								
D509003	GROUNDING SYSTEMS								

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
D5090030302	Building Grounding	1.00	EA	$2,173.32	$634.38	$1,538.94	$0.00	$0.00	$2,173.32
D509004	LIGHTNING PROTECTION								
D5090040401	Lightning Protection System	1.00	EA	$1,550.21	$431.46	$1,118.75	$0.00	$0.00	$1,550.21
Marked Up Cost					$325,212.23	$171,327.22	$1,284.25	$0.00	$497,823.69
E	EQUIPMENT & FURNISHINGS								
E20	FURNISHINGS								
E2020	MOVEABLE FURNISHINGS								
E202090	OTHER MOVEABLE FURNISHINGS								
E2020909004	Maintenance Facility Closed Office Furnishings	31.00	SF	$27.29	$846.13	$0.00	$0.00	$0.00	$846.13
Marked Up Cost					$846.13	$0.00	$0.00	$0.00	$846.13
F	SPECIAL CONSTRUCTION & DEMOLITION								
F10	SPECIAL CONSTRUCTION								
F1010	SPECIAL STRUCTURES								
F101090	OTHER SPECIAL CONSTRUCTION								
F1010909016	Garage Vehicle Exhaust System	154.51	CFM	$6.84	$418.15	$639.37	$0.00	$0.00	$1,057.52
Marked Up Cost					$418.15	$639.37	$0.00	$0.00	$1,057.52
	Facility Marked Up Cost:				$498,639.06	$317,241.66	$2,103.57	$0.00	$817,984.29
	Primary Facilities Total Marked Up Cost:				$0.00	$4,659,773.38	$130,642.18	$0.00	$10,749,436.44
	Total Facilities Marked Up Cost:				$5,959,020.88	$4,659,773.38	$130,642.18	$0.00	$10,749,436.44

Assembly Detail Report

Assembly	Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total

In-Project Lump Sums(s)

Pavement:		0.00
Site Improvements:		0.00
Utilities:		0.00
Estimated Contract Cost:		$10,749,436.44
Contingency:	5.00%	$537,471.82
SIOH:	5.70%	$643,353.77
Design	4.00%	$429,977.46
Other	0.00%	$0.00
Total Project Cost:		$12,360,239.50

Out-of-Project Lump Sum(s)

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
PRIMARY FACILITIES									
GAS DISTRIBUTION (ADVANCED)									
G	BUILDING SITEWORK								
G10	SITE PREPARATIONS								
G1020	SITE DEMOLITION & RELOCATIONS								
G102007	SITE CLEANUP								
G1020070401	Dump Charge	1,216.25	CY	$31.94	$38,848.64	$0.00	$0.00	$0.00	$38,848.64
G1030	SITE EARTHWORK								
G103002	COMMON EXCAVATION								
G1030020222	926, 1.53m3 (2.0 CY), Wheel Loader	23.00	HR	$263.57	$0.00	$3,760.68	$2,301.32	$0.00	$6,062.00
G1030020259	Cat 225, 1.15m3 (1.5 CY), Soil/Sand, Trenching	7,620.27	CY	$7.21	$0.00	$40,970.02	$13,979.84	$0.00	$54,949.86
G1030020287	15.29m3 (20 CY), Semi Dump	48.00	HR	$318.20	$0.00	$6,359.81	$8,913.97	$0.00	$15,273.78
G103003	ROCK EXCAVATION								
G1030030307	Cat 235, 1.53m3 (2 CY), Rock, No Haul off Or Borrow, Trenching	62.00	BCY	$485.64	$3,244.57	$17,754.67	$5,903.50	$3,207.03	$30,109.78
G103004	FILL & BORROW								
G1030040401	950, 2.29m3 (3 CY), Backfill W/Excavated Material	6,528.20	CY	$5.01	$0.00	$17,752.10	$14,969.38	$0.00	$32,721.48
G103005	COMPACTION								
G1030050511	Compact Soil W/Vibrating Plate	6,528.20	CY	$7.04	$0.00	$44,304.07	$1,675.74	$0.00	$45,979.82
G1030050515	Compact With Pogosticks	1,212.79	CY	$38.48	$0.00	$43,484.54	$3,182.95	$0.00	$46,667.49
Marked Up Cost					$42,093.21	$174,385.89	$50,926.71	$3,207.03	$270,612.85
G30	SITE CIVIL/MECHANICAL UTILITIES								
G3060	FUEL DISTRIBUTION								
G306006	GAS DISTRIBUTION PIPING (NATURAL AND PROPANE)								
G3060062004	Polyethylene, coils, natural gas distribution, 60 PSI, 2" diameter, @ 100', coupling, SDR 11	20,608.00	LF	$25.95	$252,327.98	$282,410.35	$0.00	$0.00	$534,738.33
G306050	GAS DISTRIBUTION ATTRIBUTES								

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Project Midpoint: Dec 2025
Area Cost Factor: 1.160
Escalation Rate: 25.6
2022 Cost Book
PACES 1.5.06.4

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G3060502402	Gas meter, digital, threaded connection, natural gas distribution, 10 lbs pressure, 425 cf/hr	1.00	EA	$866.62	$702.71	$163.91	$0.00	$0.00	$866.62
G3060502805	Gas pressure regulator, screwed end, natural gas distribution, 2"	1.00	EA	$847.44	$638.83	$208.62	$0.00	$0.00	$847.44
G3094	OTHER SITE UTILITY INFRASTRUCTURE								
G309406	OTHER VALVES								
G3094068408	Valves, plastic, polypropylene, ball, threaded, 2"	2.00	EA	$396.91	$523.84	$269.98	$0.00	$0.00	$793.81
G309408	OTHER UTILITY INFRASTRUCTUE								
G3094089901	Underground marking tape, vinyl, aluminum foil core, detectable, 2"	20,608.00	LF	$0.12	$877.66	$1,548.88	$0.00	$0.00	$2,426.54
Marked Up Cost					$255,071.02	$284,601.73	$0.00	$0.00	$539,672.75
				Facility Marked Up Cost:	$297,164.23	$458,987.62	$50,926.71	$3,207.03	$810,285.60
				Primary Facilities Total Marked Up Cost:	$0.00	$458,987.62	$50,926.71	$3,207.03	$810,285.60
				Total Facilities Marked Up Cost:	$297,164.23	$458,987.62	$50,926.71	$3,207.03	$810,285.60

Assembly Detail Report

Assembly	Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total

In-Project Lump Sums(s)

Pavement:		0.00
Site Improvements:		0.00
Utilities:		0.00
Estimated Contract Cost:		$810,285.60
Contingency:	5.00%	$40,514.28
SIOH:	5.70%	$48,495.59
Design	4.00%	$32,411.42
Other	0.00%	$0.00
Total Project Cost:		$931,706.90

Out-of-Project Lump Sum(s)

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Project Midpoint: Dec 2025
Area Cost Factor: 1.160
Escalation Rate: 25.6
2022 Cost Book
PACES 1.5.06.4

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
PRIMARY FACILITIES									
POL FUEL DISPENSING SYSTEM									
G	BUILDING SITEWORK								
G30	SITE CIVIL/MECHANICAL UTILITIES								
G3060	FUEL DISTRIBUTION								
G306004	LIQUID FUEL DISPENSING EQUIPMENT								
G3060047602	Prefab Steel Canopy, High Structure	3,600.00	SF	$233.29	$627,609.28	$188,704.22	$23,527.02	$0.00	$839,840.51
G3060048001	Fnd, Tact Refueler/Tanker, Conc	2,400.00	SF	$1.28	$0.00	$1,835.99	$1,239.80	$0.00	$3,075.79
G3060048202	Fill Strands, Top Loading, Tactical Refueler/Tanker	4.00	EA	$119,654.49	$393,672.61	$75,398.44	$9,546.90	$0.00	$478,617.96
G3060048302	Elect, Top Loading, Tactical Refueler/Tanker	4.00	EA	$19,643.40	$12,212.23	$66,361.39	$0.00	$0.00	$78,573.62
Marked Up Cost					$1,033,494.12	$332,300.04	$34,313.72	$0.00	$1,400,107.88
				Facility Marked Up Cost:	$1,033,494.12	$332,300.04	$34,313.72	$0.00	$1,400,107.88
POL FUEL RECEIVING SYSTEM									
G	BUILDING SITEWORK								
G30	SITE CIVIL/MECHANICAL UTILITIES								
G3060	FUEL DISTRIBUTION								
G306001	LIQUID FUEL DISTRIBUTION PIPING SYSTEM								
G3060011002	Parking Pad	1,600.00	SF	$62.10	$52,319.95	$40,085.18	$6,957.85	$0.00	$99,362.97
G3060011101	Direct Off Load Station	4.00	EA	$40,781.09	$141,987.88	$20,397.27	$739.19	$0.00	$163,124.34
G3060011201	Direct Off Load Pump	4.00	EA	$22,619.59	$81,502.04	$8,976.33	$0.00	$0.00	$90,478.37
G306005	LIQUID FUEL SYSTEM TRENCHBOXES								
G3060051401	High Point Vent Pit Assembly	4.00	EA	$31,994.83	$94,141.39	$30,141.97	$3,695.94	$0.00	$127,979.31
G3060051402	Low Point Pit Assembly	4.00	EA	$30,543.69	$86,644.95	$31,649.07	$3,880.74	$0.00	$122,174.76
G306090	OTHER FUEL DISTRIBUTION								

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G3060901501	Electrical/Controls, Truck Offload Station	4.00	EA	$1,181.01	$958.85	$3,765.19	$0.00	$0.00	$4,724.04
Marked Up Cost					$457,555.06	$135,015.02	$15,273.72	$0.00	$607,843.80
G40	SITE ELECTRICAL UTILITIES								
G4090	OTHER SITE ELECTRICAL UTILITIES								
G409090	OTHER CATHODIC PROTECTION								
G4090901601	CATHODIC PROTECTION, TRUCK OFFLOADING STATION	4.00	EA	$47,502.36	$134,901.13	$54,057.51	$1,050.82	$0.00	$190,009.45
Marked Up Cost					$134,901.13	$54,057.51	$1,050.82	$0.00	$190,009.45
				Facility Marked Up Cost:	$592,456.18	$189,072.53	$16,324.54	$0.00	$797,853.25

POL FUEL STORAGE TANK

G	BUILDING SITEWORK								
G30	SITE CIVIL/MECHANICAL UTILITIES								
G3060	FUEL DISTRIBUTION								
G306003	LIQUID FUEL STORAGE TANKS								
G3060032001	Earthwork, Vertical Abv Grd Tank	5,250.00	CY	$40.15	$167,836.45	$27,625.20	$15,306.79	$0.00	$210,768.44
G3060032101	Concrete, Vertical Abv Grd Tank	154.00	CY	$2,269.68	$152,461.55	$193,575.37	$3,493.05	$0.00	$349,529.97
G3060032201	Pipes And Fittings, Vertical Abv Grd Tank	1,198.00	LF	$107.49	$53,157.89	$75,611.43	$0.00	$0.00	$128,769.32
G3060032301	Electrical, Vertical Abv Grd Tank	11,656.11	LF	$74.03	$372,505.40	$490,369.29	$0.00	$0.00	$862,874.69
G3060032401	Controls, Vertical Abv Grd Tank	64.00	EA	$1,542.76	$80,713.24	$16,033.16	$1,990.30	$0.00	$98,736.71
G3060032504	Tank, 2981000 L (25000 bbl), Vertical Abv Grd Tank	2.00	EA	$3,965,330.71	$0.00	$0.00	$0.00	$7,930,661.42	$7,930,661.42
G3060032701	Concrete Covered Berm	1,122.92	LF	$828.73	$670,496.08	$160,049.24	$100,050.06	$0.00	$930,595.39
G3060032703	Concrete Covered Basin	38,600.25	SF	$46.15	$963,987.94	$814,432.16	$2,935.73	$0.00	$1,781,355.83
Marked Up Cost					$2,461,158.55	$1,777,695.86	$123,775.92	$7,930,661.42	$12,293,291.75
				Facility Marked Up Cost:	$2,461,158.55	$1,777,695.86	$123,775.92	$7,930,661.42	$12,293,291.75

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
POL INSTALLATION PIPE LINE									
G	BUILDING SITEWORK								
G30	SITE CIVIL/MECHANICAL UTILITIES								
G3060	FUEL DISTRIBUTION								
G306002	AVIATION FUEL DISTRIBUTION PIPING SYSTEM								
G3060024006	6" Carbon Steel Pipe, SCH 40 C&W	11,014.00	LF	$190.64	$796,837.12	$1,302,872.13	$0.00	$0.00	$2,099,709.25
G3060024301	Isolation Valve	3.00	EA	$1,165.30	$2,713.10	$782.81	$0.00	$0.00	$3,495.91
G306005	LIQUID FUEL SYSTEM TRENCHBOXES								
G3060054116	Above Grnd Pipe Support, Stl And Reinforced Concrete	11,014.00	LF	$6.22	$51,123.61	$17,221.36	$203.82	$0.00	$68,548.80
G3060054123	High Point Drain	13.00	EA	$23,190.62	$244,070.41	$57,407.66	$0.00	$0.00	$301,478.07
G3060054124	Low Point Drain	13.00	EA	$14,335.38	$89,394.01	$96,409.28	$556.61	$0.00	$186,359.89
Marked Up Cost					$1,184,138.25	$1,474,693.24	$760.43	$0.00	$2,659,591.92
				Facility Marked Up Cost:	$1,184,138.25	$1,474,693.24	$760.43	$0.00	$2,659,591.92
				Primary Facilities Total Marked Up Cost:	$0.00	$3,773,761.66	$175,174.61	$7,930,661.42	$17,150,844.80
				Total Facilities Marked Up Cost:	$5,271,247.10	$3,773,761.66	$175,174.61	$7,930,661.42	$17,150,844.80

Assembly Detail Report

Assembly	Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total

In-Project Lump Sums(s)

Pavement:	0.00
Site Improvements:	0.00
Utilities:	0.00

Estimated Contract Cost:		$17,150,844.80
Contingency:	5.00%	$857,542.24
SIOH:	5.70%	$1,026,478.06
Design	4.00%	$686,033.79
Other	0.00%	$0.00
Total Project Cost:		$19,720,898.89

Out-of-Project Lump Sum(s)

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
PRIMARY FACILITIES									
ROADWAY (ADVANCED)									
G	BUILDING SITEWORK								
G10	SITE PREPARATIONS								
G1010	SITE CLEARING								
G101001	CLEARING								
G1010010107	Medium Brush, Medium Trees, Clear, Grub, Haul	48.10	ACRE	$20,742.19	$0.00	$775,796.72	$221,902.59	$0.00	$997,699.31
G1030	SITE EARTHWORK								
G103001	GRADING								
G1030010103	Rough Grading, 0.0014 T (14G), 1 Pass	348,318.67	SY	$0.00	$0.00	$283.53	$230.44	$0.00	$513.97
G1030010105	Fine Grading, Hand	7,409.33	SY	$25.55	$0.00	$189,276.39	$0.00	$0.00	$189,276.39
G1030010108	Fine Grading, 0.013 T (130G), 2 Passes	245,872.00	SY	$2.72	$0.00	$462,454.93	$206,257.73	$0.00	$668,712.66
G103002	COMMON EXCAVATION								
G1030020202	Ditch Excavation, Normal Soil, Haul off Spoil 1.61 km (1 Mile)	19,920.19	CY	$26.24	$0.00	$358,097.11	$164,545.92	$0.00	$522,643.03
G1030020203	Roadway Soil Excavation, W/Scraper, Load & Haul Spoil	36,046.05	CY	$15.19	$0.00	$384,724.34	$162,781.81	$0.00	$547,506.15
G1030020205	Curb/Sidewalk Excav & Bkfl, 27% Haul off Spoil, 1.61 km (1 Mile)	1,234.83	CY	$36.52	$0.00	$34,532.55	$10,566.82	$0.00	$45,099.37
G103004	FILL & BORROW								
G1030040417	Delivered & Dumped - Hand, Backfill W/Sand	686.05	CY	$241.56	$20,014.19	$143,672.66	$2,033.37	$0.00	$165,720.22
G103005	COMPACTION								
G1030050501	Compact Subgrade, 2 Lifts	58,053.11	CY	$7.61	$0.00	$425,925.82	$16,105.22	$0.00	$442,031.04
G1030050511	Compact Soil W/Vibrating Plate	686.05	CY	$7.04	$0.00	$4,655.92	$176.10	$0.00	$4,832.03
Marked Up Cost					$20,014.19	$2,779,419.97	$784,600.02	$0.00	$3,584,034.17
G20	SITE IMPROVEMENTS								
G2010	ROADWAYS								
G201001	BASES & SUBBASES								

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G2010010102	Gravel, Delivered & Dumped	36,046.05	CY	$46.85	$1,688,659.50	$0.00	$0.00	$0.00	$1,688,659.50
G2010010104	Asphalt, Intermediate Course (Line Item Incl 5% Waste)	8,912.86	TON	$175.88	$1,355,117.71	$168,358.16	$44,137.75	$0.00	$1,567,613.62
G201003	PAVED SURFACES								
G2010030310	Prime Coat	81,957.33	SY	$6.90	$408,380.86	$108,675.57	$48,040.05	$0.00	$565,096.48
G2010030311	Tack Coat	163,914.67	SY	$3.10	$195,464.36	$217,351.15	$96,080.10	$0.00	$508,895.61
G2010030312	Asphalt Wearing Course,1 Pass (Line Item Incl 5% Waste)	4,438.60	TON	$199.26	$749,279.73	$104,626.72	$30,525.75	$0.00	$884,432.20
G201004	MARKING & SIGNAGE								
G2010040401	X Walk, Stop Lines, Per Lane, Intersection Painting	12.00	EA	$168.54	$1,632.84	$279.20	$110.43	$0.00	$2,022.47
G2010040402	Turn Lane, Per Lane, Intersection Painting	18.00	EA	$109.03	$1,586.85	$269.16	$106.46	$0.00	$1,962.46
G2010040403	Arrows, Per Lane, Intersection Painting	18.00	EA	$103.18	$528.95	$951.77	$376.52	$0.00	$1,857.24
G2010040405	No Pass Stripe, Yellow	10,142.22	LF	$2.61	$19,869.30	$4,719.53	$1,867.58	$0.00	$26,456.42
G2010040406	Centerline Stripe, White	61,468.00	LF	$7.27	$361,260.01	$61,275.95	$24,236.91	$0.00	$446,772.87
G2010040407	Edge Stripe, Yellow	61,468.00	LF	$2.61	$120,420.00	$28,603.22	$11,318.69	$0.00	$160,341.92
G2010040410	Street Signs, Average	8.00	EA	$172.18	$638.83	$682.10	$56.53	$0.00	$1,377.46
G2010040411	Traffic Signs & Posts, Average	8.00	EA	$174.31	$655.86	$682.10	$56.53	$0.00	$1,394.50
G201005	GUARDRAILS & BARRIERS								
G2010050501	Guardrail, Single Rail, Wood Posts	1,746.25	LF	$89.06	$135,725.36	$18,284.97	$1,515.35	$0.00	$155,525.68
G2010050502	Guardrail, Single Rail, Wood Posts, Ends	35.00	EA	$341.14	$7,415.71	$4,177.88	$346.25	$0.00	$11,939.84
G2030	PEDESTRIAN PAVING								
G203003	PAVED SURFACES								
G2030030301	Standard 101.60mm (4") Sidewalk W/Mesh, Formed	44,456.00	SF	$18.74	$298,906.57	$534,169.41	$0.00	$0.00	$833,075.98
G2040	SITE DEVELOPMENT								
G204001	FENCING & GATES								
G2040010110	Barbed Wire Fencing, 3-Strand	61,468.00	LF	$23.11	$713,357.63	$651,436.35	$55,875.02	$0.00	$1,420,669.00
Marked Up Cost					$6,058,900.07	$1,904,543.25	$314,649.93	$0.00	$8,278,093.25

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Project Midpoint: Dec 2025
Area Cost Factor: 1.160
Escalation Rate: 25.6

Assembly Detail Report

Assembly		Quantity	UOM	Unit Cost	Material	Labor	Equipment	Sub Bid	Total
G30	SITE CIVIL/MECHANICAL UTILITIES								
G3030	STORM SEWER								
G303004	CULVERTS								
G3030040403	15.85mm (52') Complete, 609.60mm (24") CMP Culvert W/Headwalls	18.00	EA	$24,933.44	$225,972.13	$202,843.48	$19,986.28	$0.00	$448,801.88
Marked Up Cost					$225,972.13	$202,843.48	$19,986.28	$0.00	$448,801.88
	Facility Marked Up Cost:				$6,304,886.39	$4,886,806.69	$1,119,236.22	$0.00	$12,310,929.31
	Primary Facilities Total Marked Up Cost:				$0.00	$4,886,806.69	$1,119,236.22	$0.00	$12,310,929.31
	Total Facilities Marked Up Cost:				$6,304,886.39	$4,886,806.69	$1,119,236.22	$0.00	$12,310,929.31

In-Project Lump Sums(s)

Pavement:	0.00
Site Improvements:	0.00
Utilities:	0.00

Estimated Contract Cost:		$12,310,929.31
Contingency:	5.00%	$615,546.47
SIOH:	5.70%	$736,809.12
Design	4.00%	$492,437.17
Other	0.00%	$0.00
Total Project Cost:		$14,155,722.06

Out-of-Project Lump Sum(s)

Note: All Costs Include ACF, Markups and Escalation

Project Location: Nellis Air Force Base, Nevada
Project Midpoint: Dec 2025
Area Cost Factor: 1.160
Escalation Rate: 25.6
2022 Cost Book
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