LEGISLATIVE ROUNDTABLE

Topic 1: Update on Base Realignment Activities

Topic 2: Status of the Live Fire Training Range Complex (LFTRC), Northwest Field

Topic 3: Status of Range Environmental Vulnerability Assessment (REVA) program

Topic 4: Update on activities under the Programmatic Agreement

NEPA Process and Guam Buildup Decision

2015 Final SEIS Record of Decision

- The Dept. of Navy considered **the environmental consequences of the proposed action, as well as strategic, operational, and training requirements, obligations under treaties and other international agreements, and cost,…**

- **The decision adopted all (but two) of the mitigation measures that were identified in the 2015 Final SEIS to avoid or minimize adverse environmental impacts from the preferred alternatives…**

The National Environmental Policy Act (NEPA) is often characterized as an environmental impact review law, and it is that – but it is more than that. It is a law that has made **informed decision making** about the environment a key component of every major federal action or approval. NEPA also enlists the **participation of the public** in sharing its wisdom and knowledge to assist federal agencies in making informed decisions that seek to improve rather than degrade the environment. *NEPA Success Stories: Celebrating 40 Years of Transparency and Open Government* (Aug 2010 Environmental Law Institute)

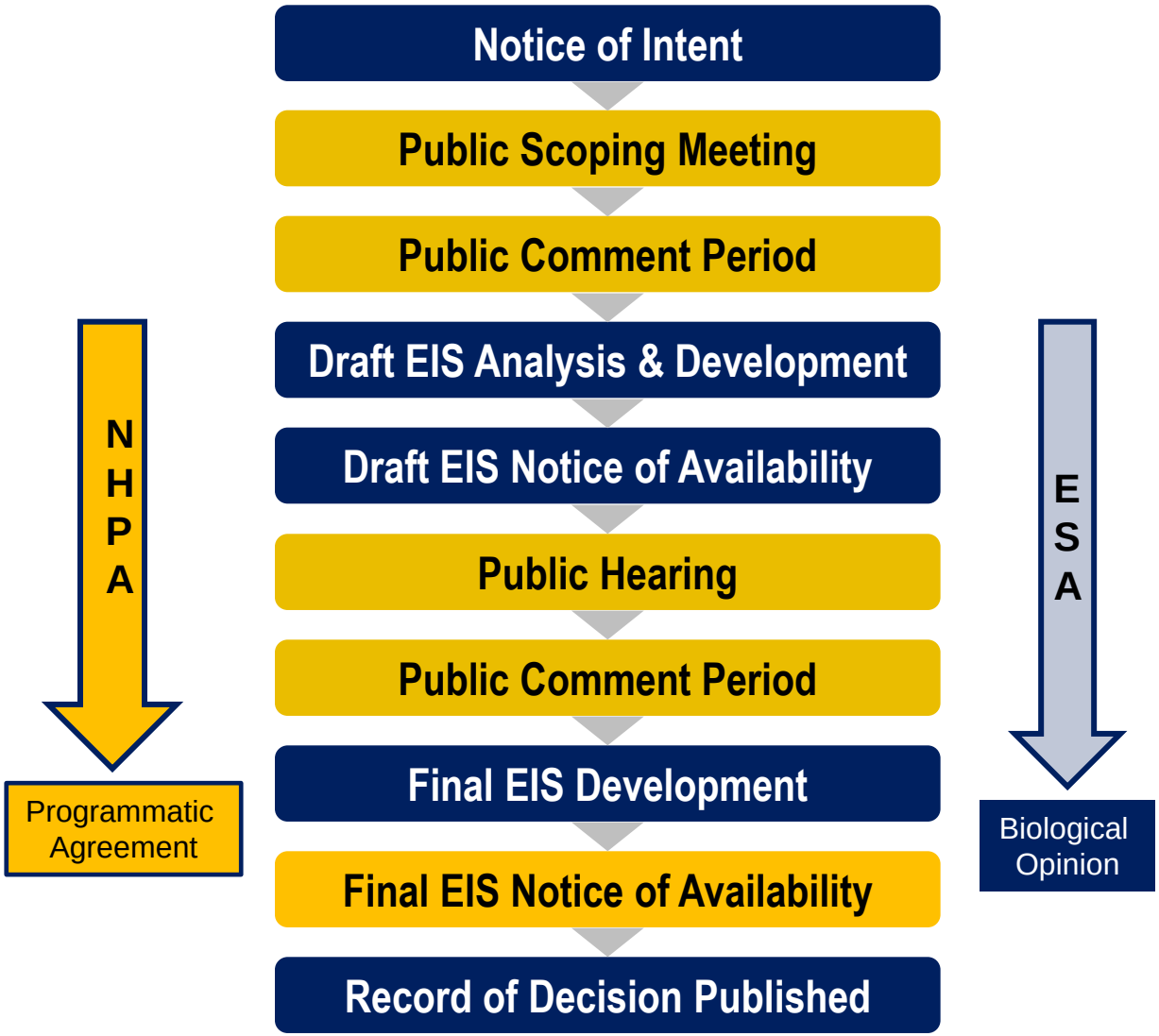
NEPA: Natural & Human Environment w/ Public Participation

- Marine resources – essential fish habitat, coral reefs, marine mammals
- Dredging and disposal requirements in Apra Harbor
- **Endangered species**
- Invasive species (e.g. brown tree snake)
- Wildlife habitat
- Wetlands
- **Cultural and archaeological resources**
- **Noise**
- Air quality
- **Water quality**
- Recharge of groundwater aquifers
- Changes in land use
- Coastal zone impacts
- Air space management
- Cumulative impacts

NEPA: Natural & Human Environment w/ Public Participation

- **Access to recreation locations**
- **Safety**
- Quality of life
- Labor-related issues
- **Population increase and associated effects**
- **Chamorro interests – sacred burial grounds, cultural sites**
- Increases in traffic
- Utility requirements
- Small business opportunities
- Availability and cost of civilian housing
- **Noise**
- Land use
- Effect on educational facilities
- Effect on public health and social services
- **Effect on local fisherman/fishing industry**
- **Effect on tourism and recreation**

NEPA Public Involvement



EIS Public Involvement

2010 EIS/ROD (Notice of Intent 2007)

- 2 Public Scoping Mtgs: Apr 2007 (Yona & Dededo)
- 990 Scoping Comments w/in 75-day extended period
- 4 Public Hearings: Jan 2010 (Santa Rita, Mangilao, Yigo & Dededo); 1,977 people; 204 comments
- DEIS Public Comment period 90 days
- 10,323 comments

LFTRC SEIS (Transitioned)

- 3 Public Scoping Mtgs: Mar 2012 (UOG, Southern HS, and Yigo Gym); 300 people
- 348 Scoping Comments w/in 56-day period

2015 SEIS/ROD (Biological Opinion 2017)

- 3 Public Scoping Mtgs: Nov 2012 (McCool, Okkodo, UOG); 241 people
- 398 Scoping Comments w/in 61-day period
- 3 Public Hearings: May 2014 (Okkodo, FD, McCool)
- DSEIS Public Comment extended period of 75 days
- 906 comments submissions

"Guam Buildup" Environmental Planning required one decade to complete

2010 EIS/ROD Alternatives (Old)

Reasonable > Preferred > Selected

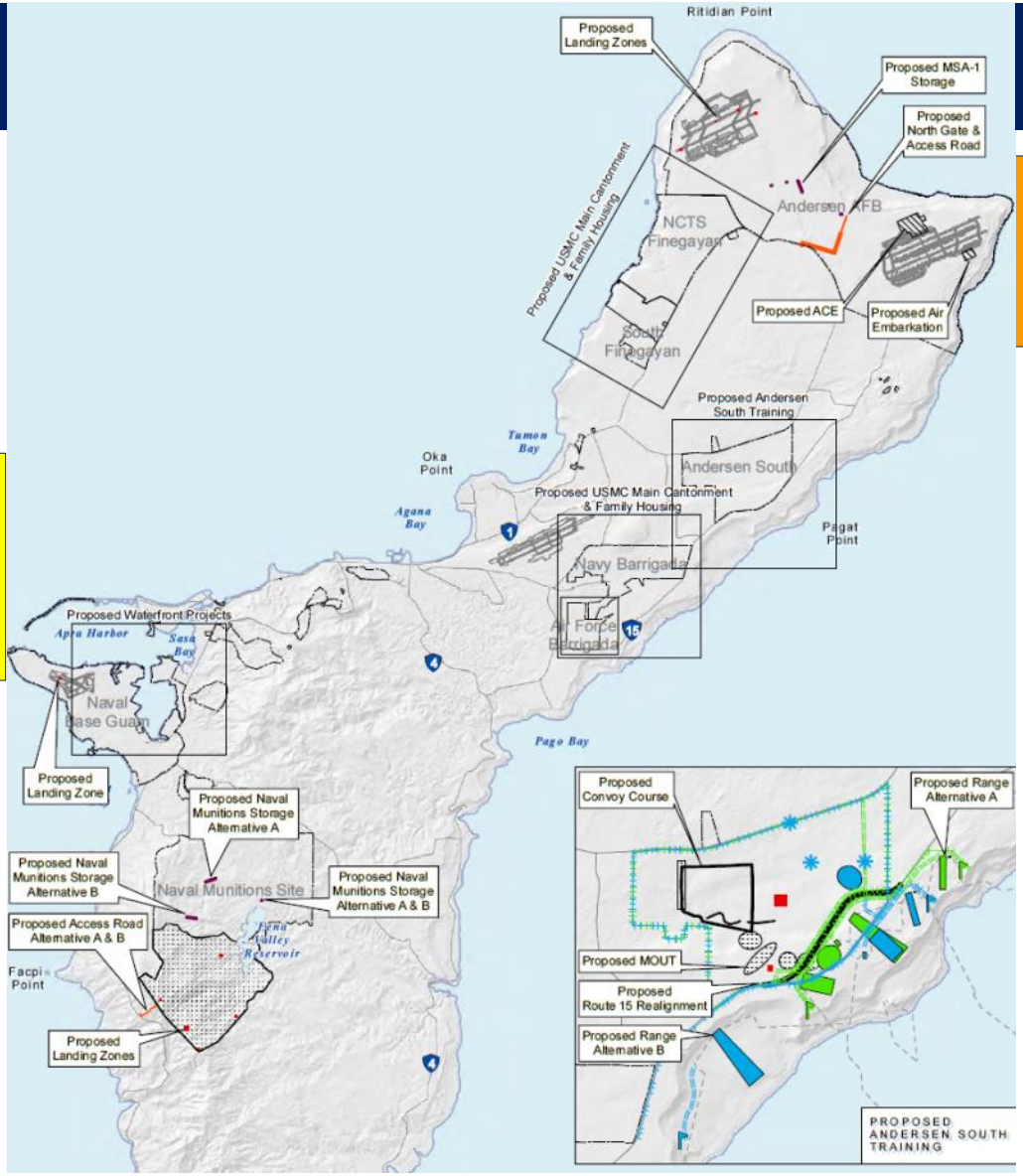
Main Cantonment / Family Housing

1. Finegayan + Former FAA + South Fin + Harmon Annex
-acquire 1,008 acres

2. Finegayan + Former FAA + South Finegayan
-acquire 680 acres

3. Finegayan + South Fin / Barrigada

4. Finegayan / FAA + South Finegayan + AF Barrigada
-acquire 680 acres



Live Fire Training Range Complex

1. Pagat Alternative A
-acquire 1,090 acres
-realigns Route 15

2. Pagat Alternative B
-acquire 1,800 acres

*NOTE: Other range alternatives dismissed include: **Existing ranges**, Finegayan, Northwest Field, Tarague Beach, Andersen South, Air Force Barrigada, NBG Orote Point, Naval Munitions Site due to: insufficient land, operational, land use and environmental constraints. No Action Alternative does not meet purpose/need of proposed action.*

2015 SEIS/ROD Alternatives

Reasonable > Preferred > Selected

Main Cantonment / Family Housing

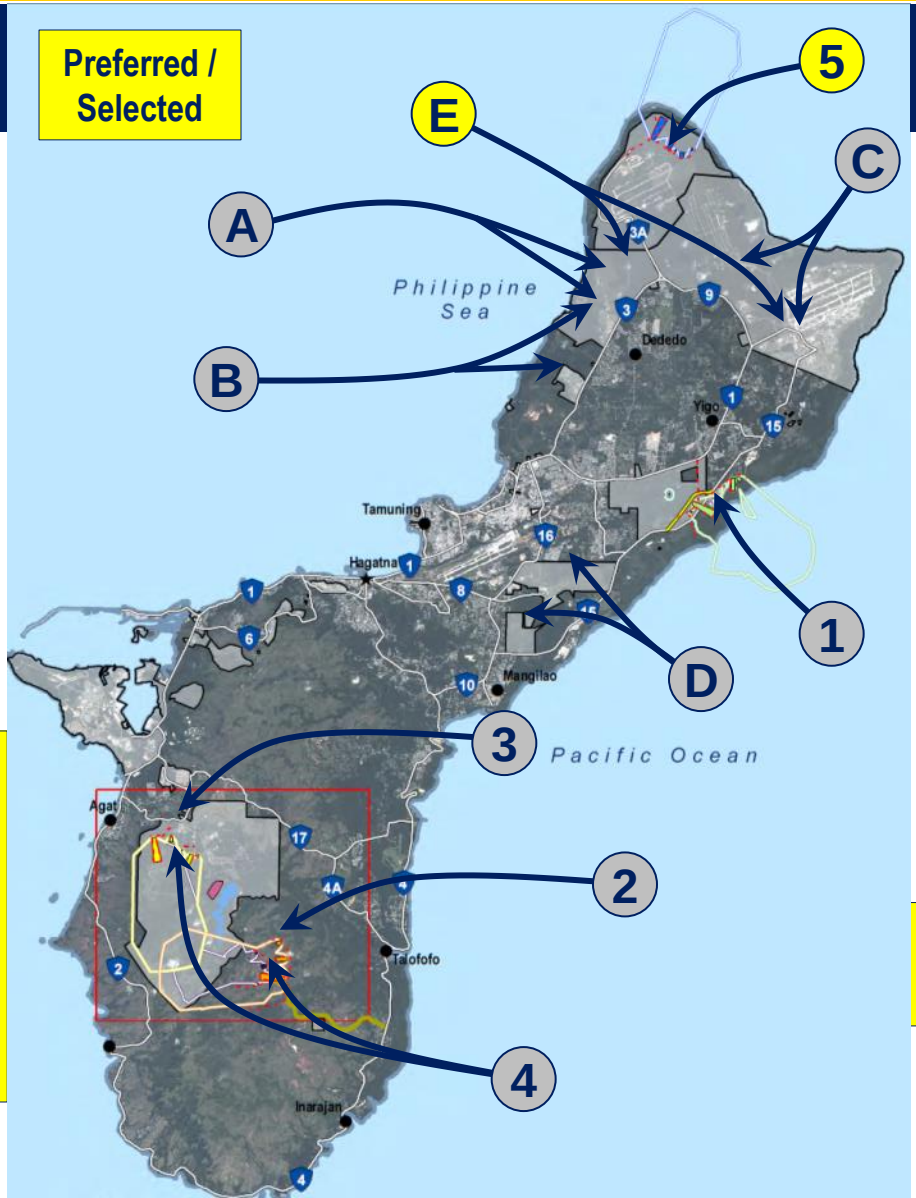
A. Finegayan / Finegayan

B. Finegayan / South Finegayan

C. AAFB / AAFB

D. Barrigada / Barrigada

E. Finegayan / AAFB
-combination of Alts A & C
-avoids loss of limestone forest in Alt A Family Housing area (>200 ac)
- no land acquisition



Live Fire Training Range Complex

1. Pagat Option A
-acquires 896 or 915 acres
-realigns Route 15

2. Naval Magazine (E/W)
-acquires 1,894 or 3,648 acres

3. Naval Magazine (N/S)
-acquires 252 or 905 acres

4. Naval Mag (L-Shaped)
-acquires 914 or 3,671 acres

5. Northwest Field
-no land acquisition

Key Differences (2010 to 2015)

2010 Final EIS

Relocate approximately
8,600 Marines
9,000 family members
from Okinawa to Guam

Population increase of 79,000 at peak over 4 years
(too much too fast)

Land acquisition of 688 acres
(stay on Federal land)

Results in loss of Guam International Raceway
(13,000 signature petition – Not Pagat, move LFTRC to NWF)

2010 Final EIS		2015 Final SEIS
Approximately 8,600 Marines and 9,000 dependents relocating over 5 years	Relocated Population	Approximately 5,000 Marines and 1,300 dependents relocating over 12 years
7-year intense construction boom followed by sharp decline	Construction Period	13-years of moderate construction activity with gradual phase out
More than 79,000 new Guam residents at peak	Peak Population Increase	Less than 10,000 new Guam residents at peak
More than 33,000 additional Guam residents	Steady State Population Increase	Approximately 7,400 additional Guam residents
2,580 acres at Finegayan preferred alternative	Project Area: Cantonment	1,723 acres at Finegayan/AAFB preferred alternative
Acquisition of 688 acres of non-federal land at Finegayan preferred alternative	Land Acquisition: Cantonment	No land acquisition at Finegayan/AAFB preferred alternative
5,529 acres for Route 15 preferred alternative (4,439 acres in SDZs, mostly over ocean)	Project Area: LFTRC	3,957 acres for Northwest Field preferred alternative (3,701 acres in SDZs, mostly over ocean)
Acquisition of more than 1,000 acres of non-federal land at Route 15 preferred alternative	Land Acquisition: LFTRC	No land acquisition at Northwest Field preferred alternative
20 megawatts	Power Demand	5.7 megawatts
5.82 million gallons/day	Potable Water Demand	1.7 million gallons/day
2.6 million gallons/day	Wastewater Generation	1.2 million gallons/day
165,600 pounds/day	Solid Waste Generation	54,250 pounds/day
4 alternative sites in EIS analysis, all in same vicinity	EIS Alternatives: Cantonment	5 alternative sites in 3 different areas on Guam
2 alternative sites in EIS analysis, both in same vicinity	EIS Alternatives: LFTRC	5 alternative sites in 3 different areas on Guam

2015 Final SEIS

Relocate approximately
5,000 Marines
1,300 family members
from Okinawa to Guam

Population increase less than 10,000 at peak over 13 years
(reduced scope and gradual pace)

No land acquisition
(stayed on Federal land)

No effect to Pagat cultural site and Guam International Raceway
(selected NWF)

Status of Regulatory Compliance for the Guam "Buildup"

✓National Historical Preservation Act (public involvement)

- Programmatic Agreement
- Training Range Review and Analysis
- Range Mitigation Plan

✓National Environmental Policy Act (public involvement)

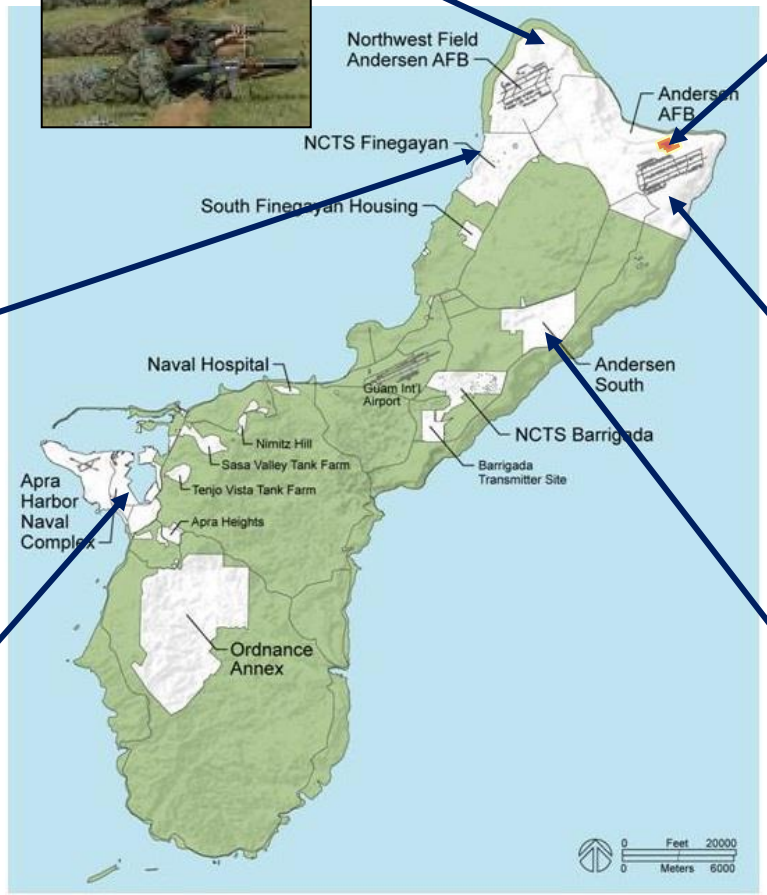
- Supplemental Environmental Impact Statement
  - * Endangered Species Act
  - * Magnuson-Stevens Fishery Conservation and Management Act
  - * National Historic Preservation Act (and others)
- Record of Decision
- Mitigation Monitoring **(ongoing)**

Guam Force Structure Increase Locations

AAFB NW Field Live Fire Training Range Complex

AAFB North Ramp USMC ACE

MCB Guam – Main Cantonment at Finegayan



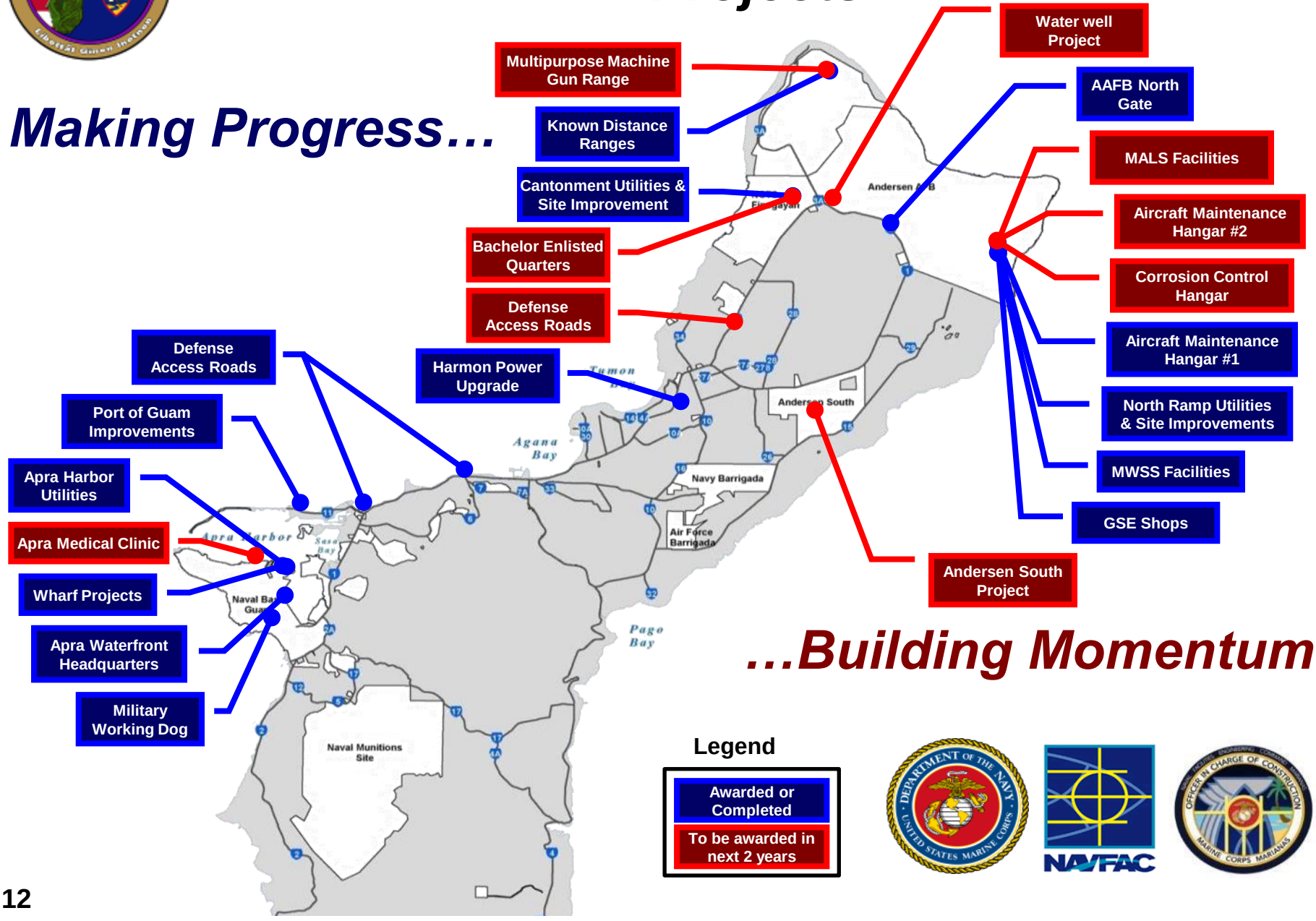
AAFB QOL Family Housing

Apra Harbor USMC Sea Embarkation

AAFB South – Military Operations on Urbanized Terrain (MOUT)

Defense Policy Review Initiative (DPRI) Projects

Making Progress…



…Building Momentum

Legend

- Awarded or Completed
- To be awarded in next 2 years

Direct Support to the Community

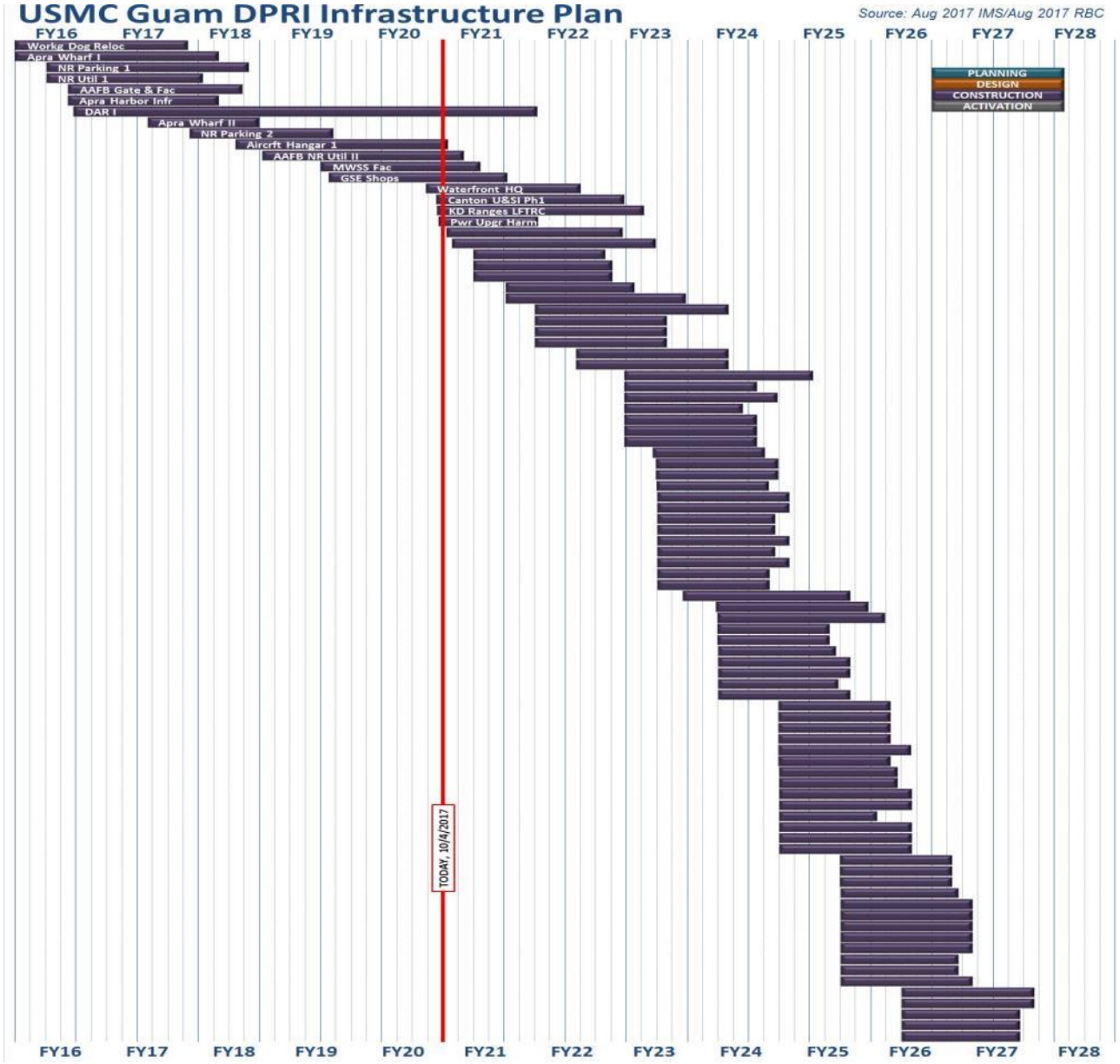
COMPLETED/AWARDED… ~$134M+ Invested

- ✓ **Modernization of the Guam Commercial Port - Dec 2015 - $50M**
- ✓ **Defense Access Roads Program - ~$84M Total**
  - **Intersection improvements Rts 1 & 11 - Jul 2013 - $15.3M**
  - **Intersection improvements Rts 1 & 8 / Agana Bridge - Dec 2013 - $16.4M**
  - **Rts 1 & 3 Intersection improvements - Est Jan 2018 - $6.8M**
  - **Rt 3 Widening - late CY17 Award - $45.6M**
- ✓ **Rehab of Tumon Maui Well - Jul 2016**

IN THE FUTURE… ~$185M Investment

- **Guam Water Authority Northern District Waste Water Treatment Plant Upgrades**
- **Guam Cultural Repository**
- **GWA Interceptor Sewer Refurbishment (Phases 1 and 2)**
- **Northern Guam Lens Aquifer Monitoring System Expansion**

Looking to the Future

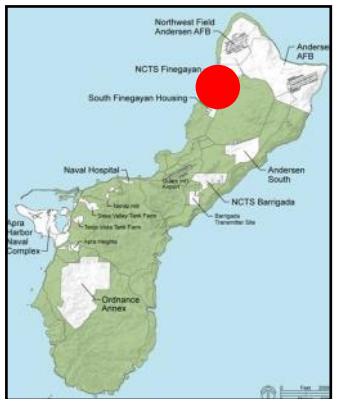


J-001B: Utilities & Site Improvements Phase 1
Marine Corps Base Guam, Finegayan

Construction Award: 17 Aug 2017
Completion: 16 Aug 2020
Award Amount: $164.9M
Contractor: Granite-Obayashi JV

Scope of Work:

- Clear and grade site, install initial electrical, mechanical, water and wastewater utilities and build all main roads for the future Marine Corps Base Guam at the current Naval Base Guam Telecommunications Station at Finegayan. The project also includes clearing the site of unexploded ordnance and munitions and explosives of concern.



AWARDED

P-102 Power Upgrade - Harmon

Construction Award: 31 Aug 2017

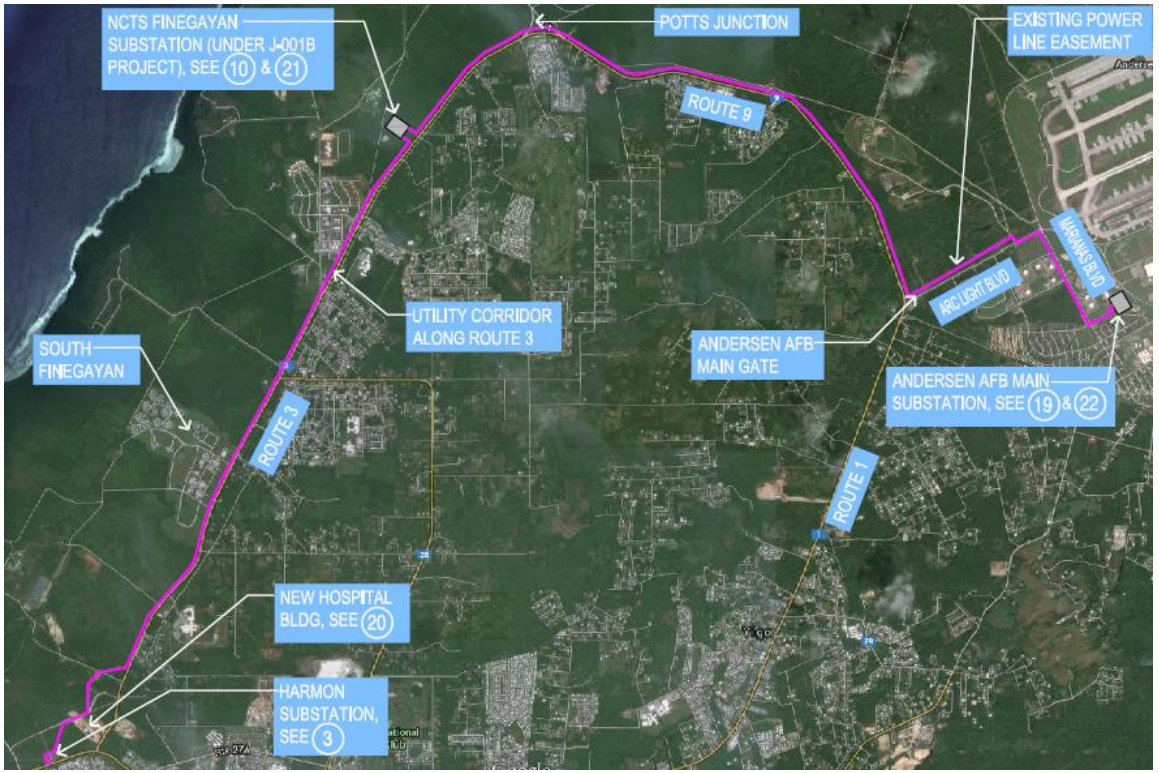
Completion: 18 Mar 2020

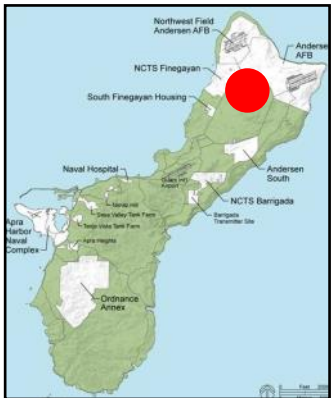
Award Amount: $28.5M

Contractor: Hensel Phelps Construction Co

Scope of Work:

- Project installs a new 34.5 kilovolt (kV) underground electrical transmission line in concrete-encased duct banks from the Harmon Substation to a substation being constructed for the future Marine Corps Base Guam at Finegayan, then to the main substation at Andersen Air Force Base.





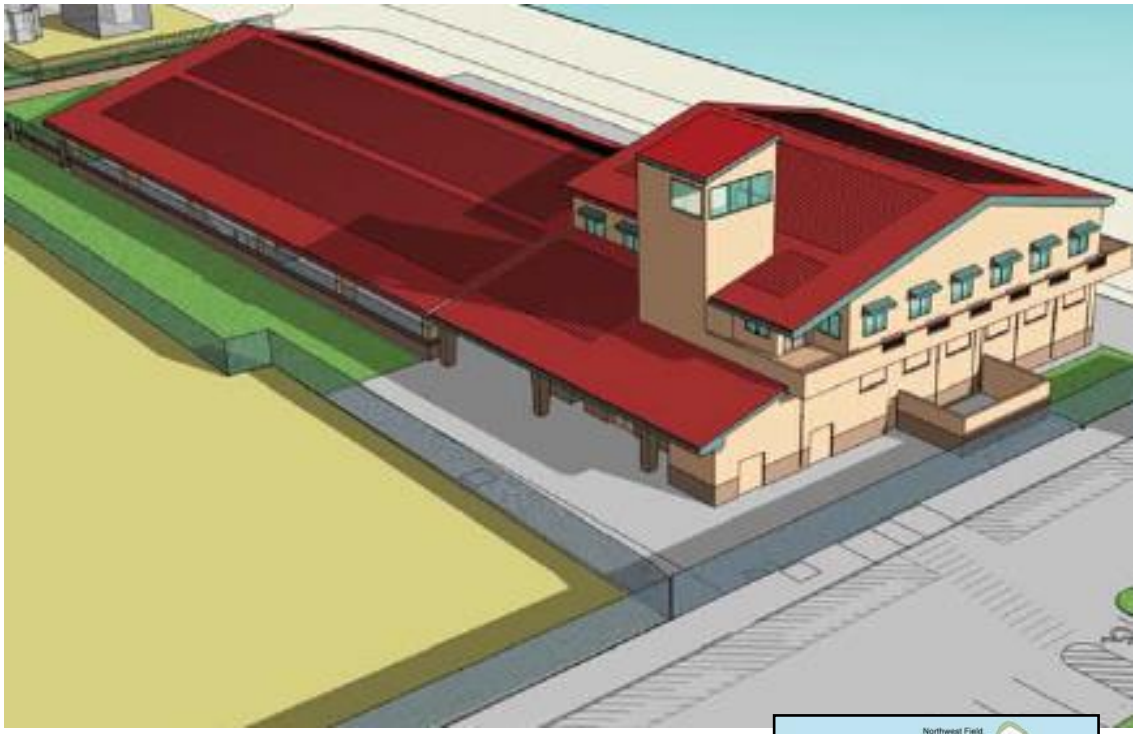
AWARDED

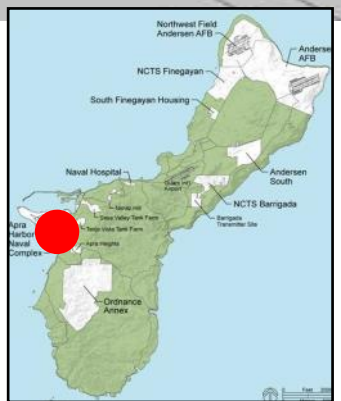
J-007 Waterfront Headquarters, Naval Base Guam

Construction Award: 18 Sep 2017
Completion: 11 Apr 2019
Award Amount: $17.9M
Contractor: Contrack Watts, Inc

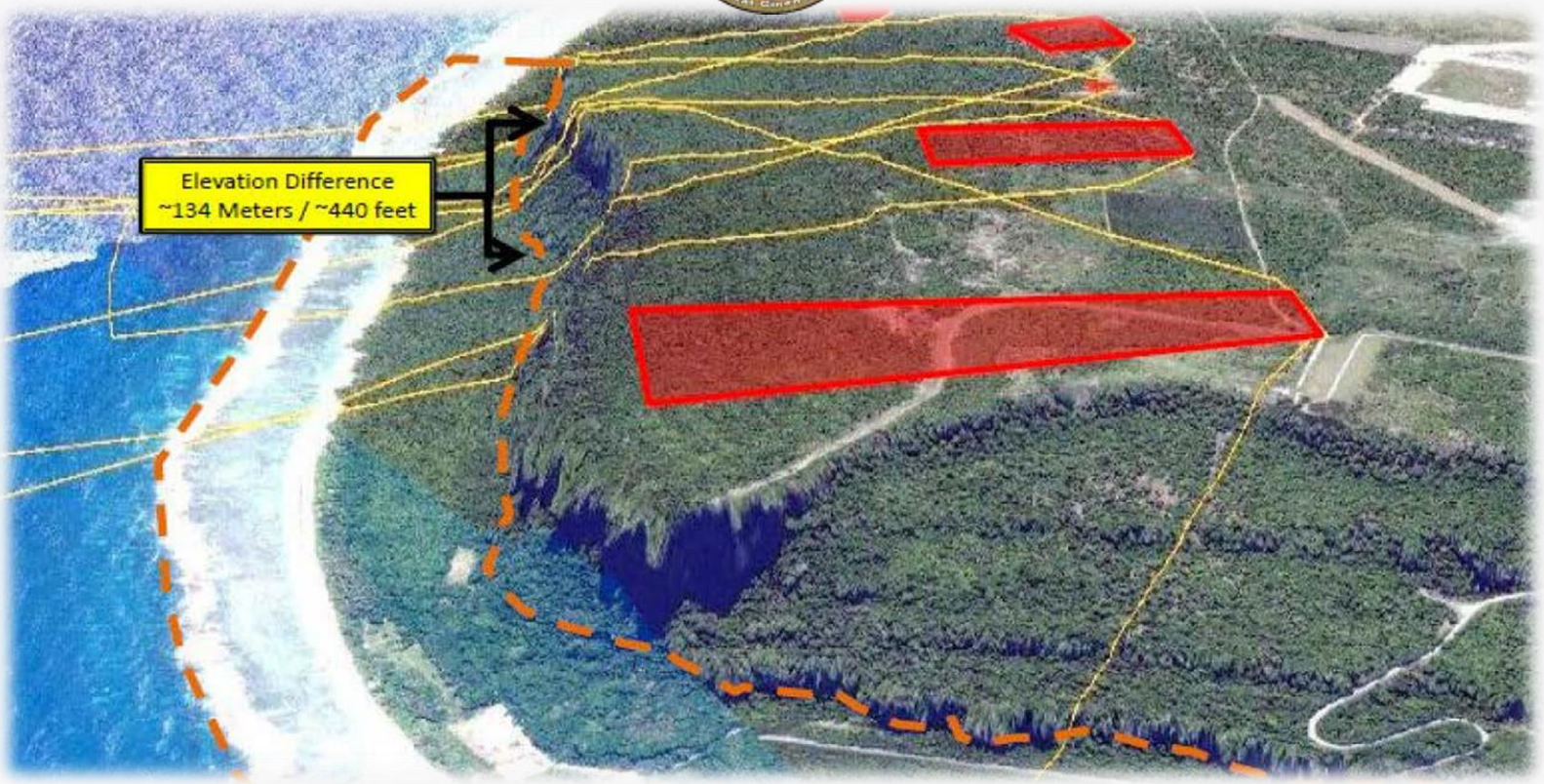
Scope of Work:

- Build an administrative facility to support the embarkation and debarkation of Marine Corps personnel and equipment at Apra Harbor on Naval Base Guam.





AWARDED

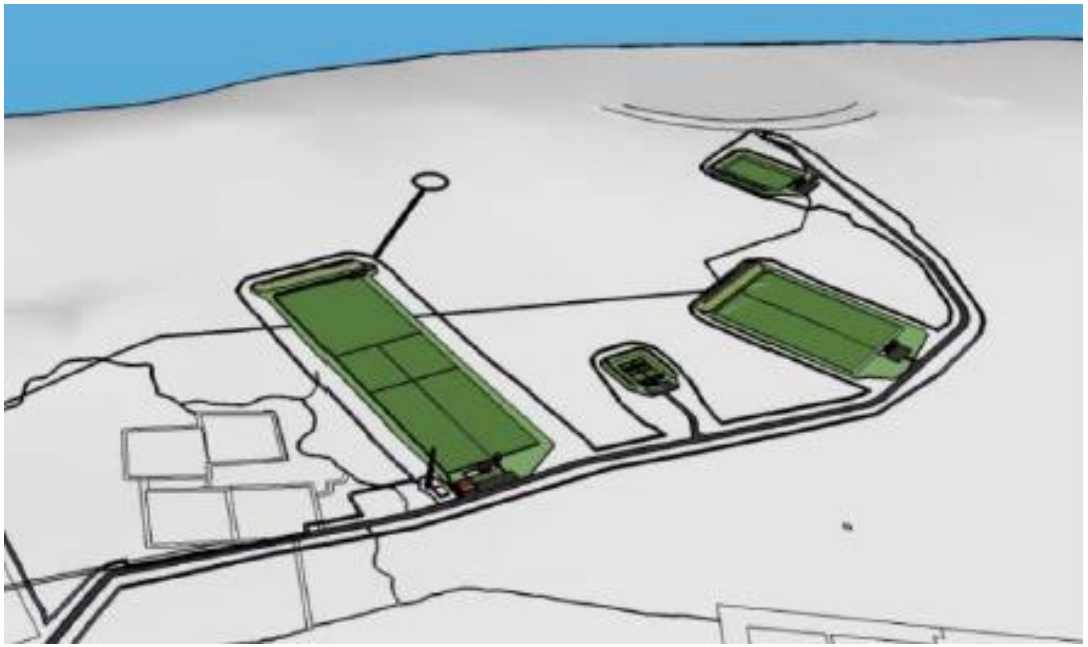


Topic 2: Status of the Live Fire Training Range Complex (LFTRC), Northwest Field

Speaker: CAPT Dan Turner, Officer-In-Charge of Construction MCM
COL Brent Bien, Officer-In-Charge, Marine Corps Activity Guam

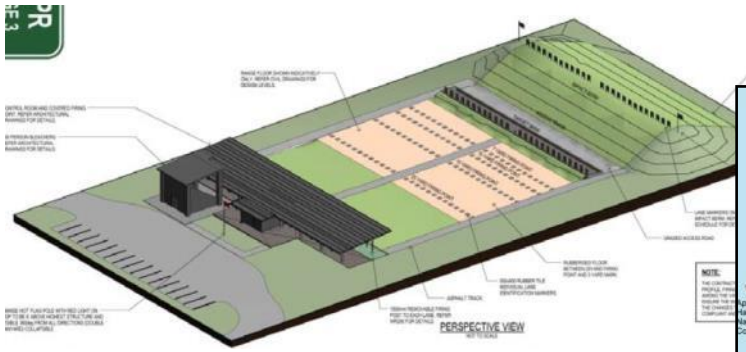
P-715 Known Distance Ranges, Live Fire Training Range Complex, Northwest Field

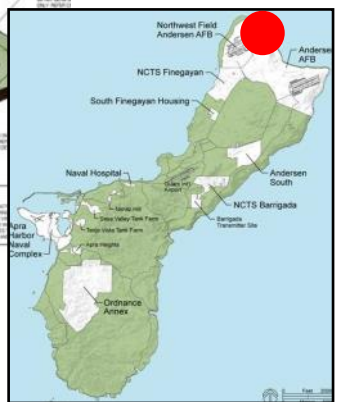
Construction Award: 24 Aug 2017
Completion: 26 Nov 2020
Award Amount: $78.2M
Contractor: Black Construction



Scope of Work:

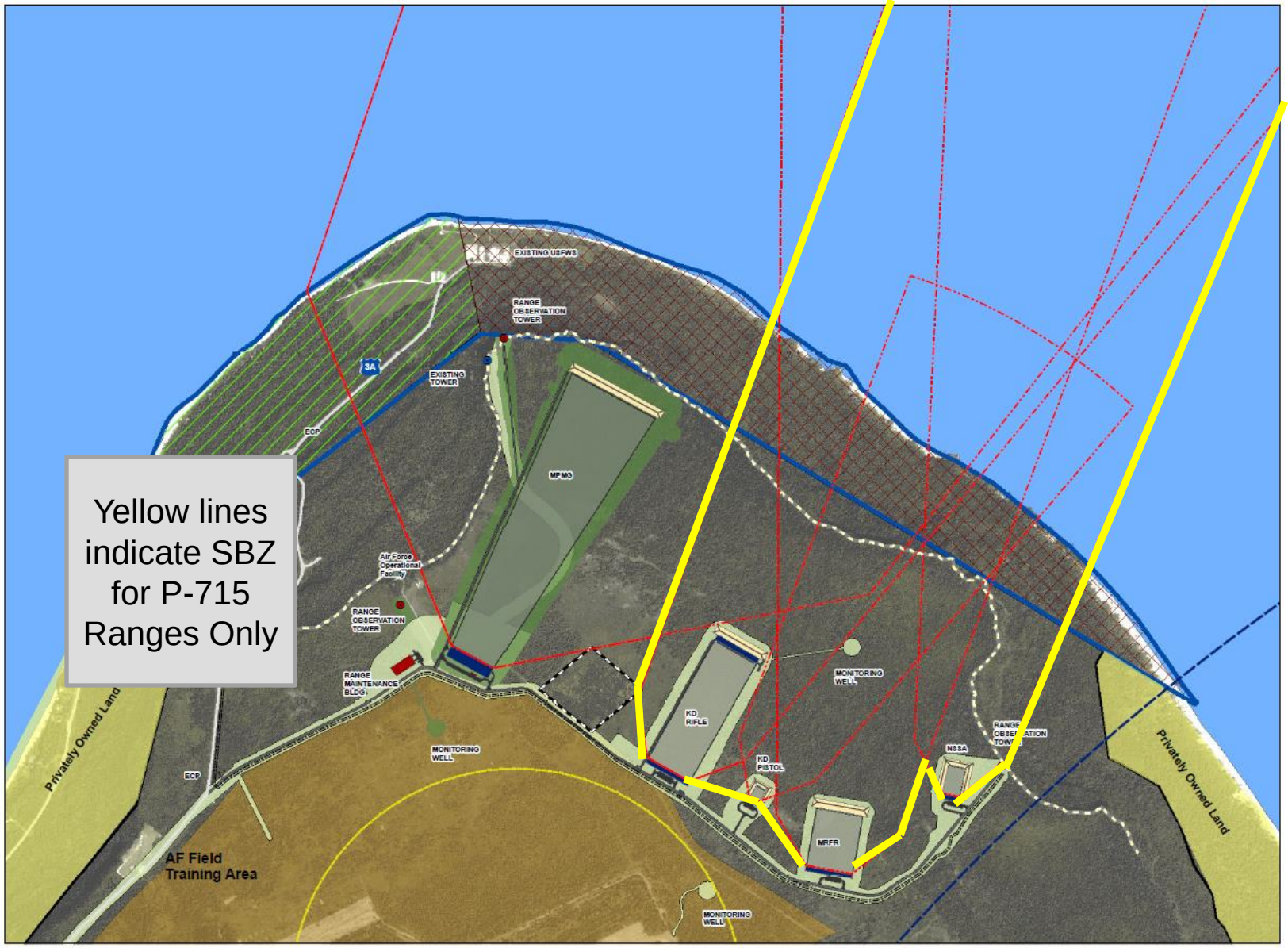
- Project constructs four small arms firing ranges consisting of a 25-firing point Known Distance Pistol Range, a 50-firing point Known Distance Rifle Range, a 25-firing point Non-Standard Small Arms Range, and a 16-firing point Modified Record of Fire Range.
- Has 180-day delayed start for site work on actual ranges to allow for EV mitigation work to relocate endangered species. Work can start in those areas no earlier than 21 Feb 2018.





AWARDED

Safety Buffer Zone, P-715 Only

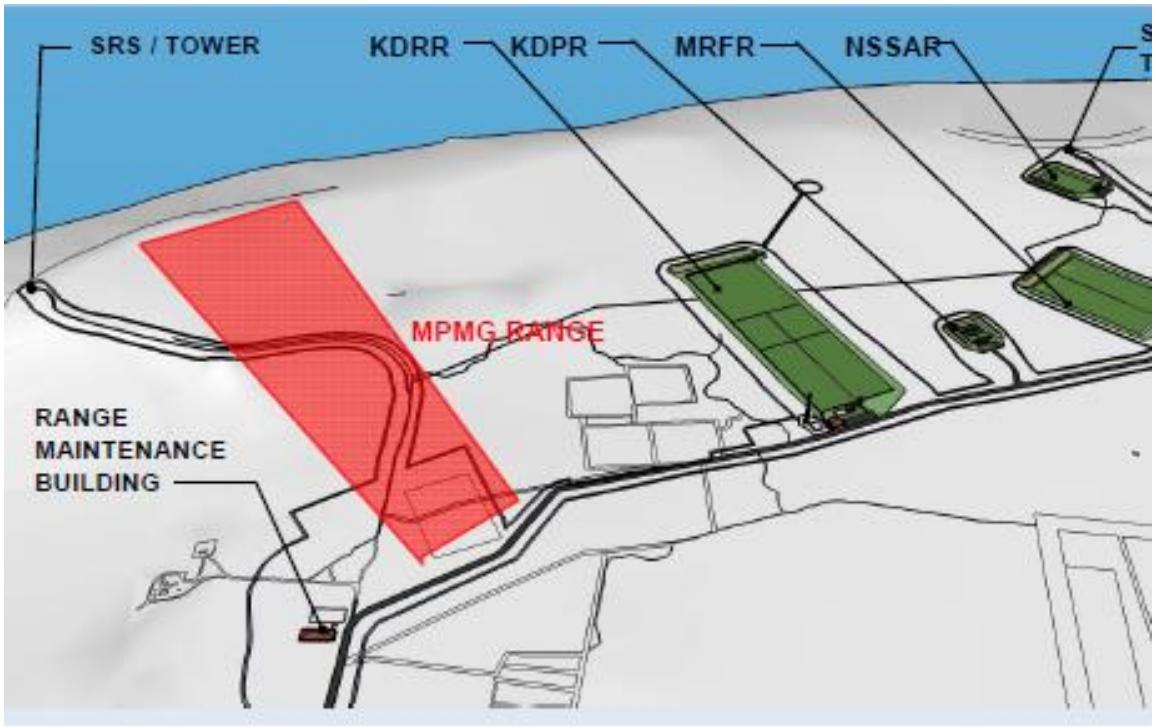


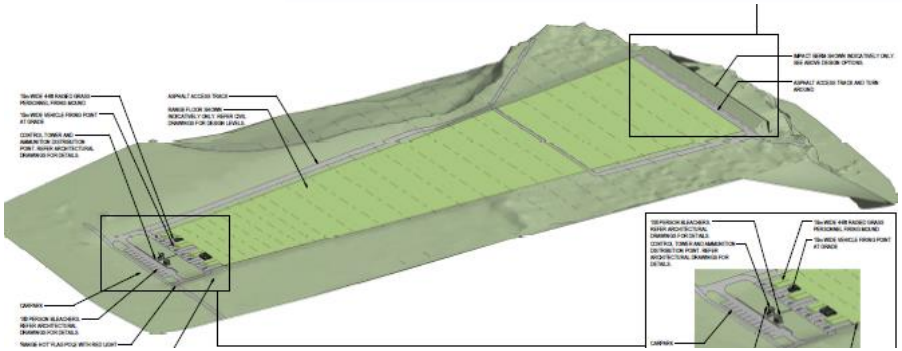
P-735: Multipurpose Machine Gun Range, Northwest Field

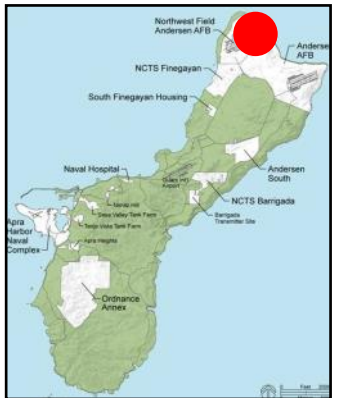
Construction Award: 2019
Completion: 2022

Scope of Work:

- Construct an automated Multipurpose Machine Gun Range at the LFTRC at NWF. Project will consist of a multi-lane machine gun range with multiple target emplacements on each lane. Additional structures will include a Range Control Tower, enclosed/covered bleacher area, and trash enclosure.
- Supporting facilities include a gravel maintenance road, two monitoring wells, and associated utilities.

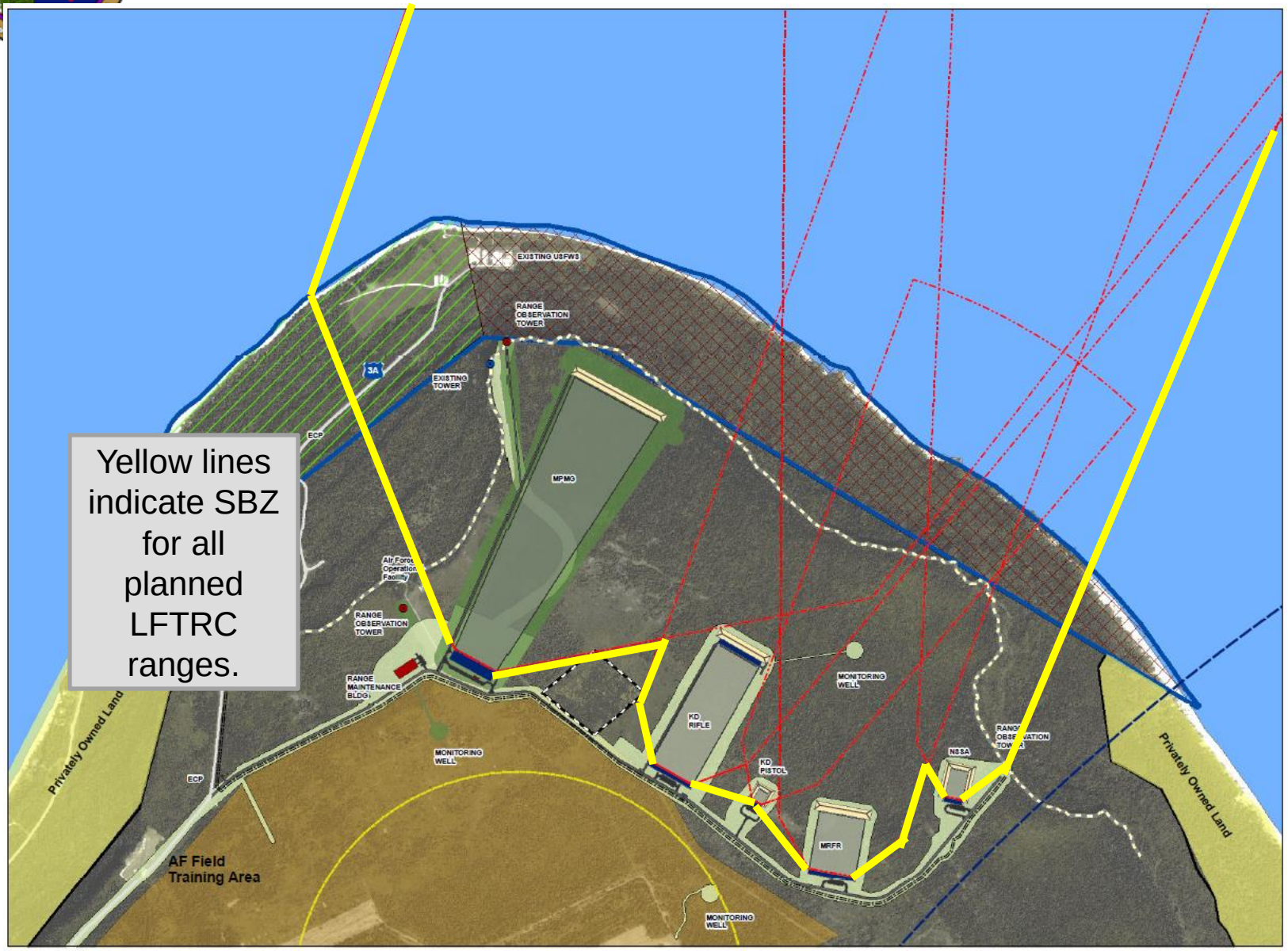






Future FY19 Award

Safety Buffer Zone, P-715 & P-735



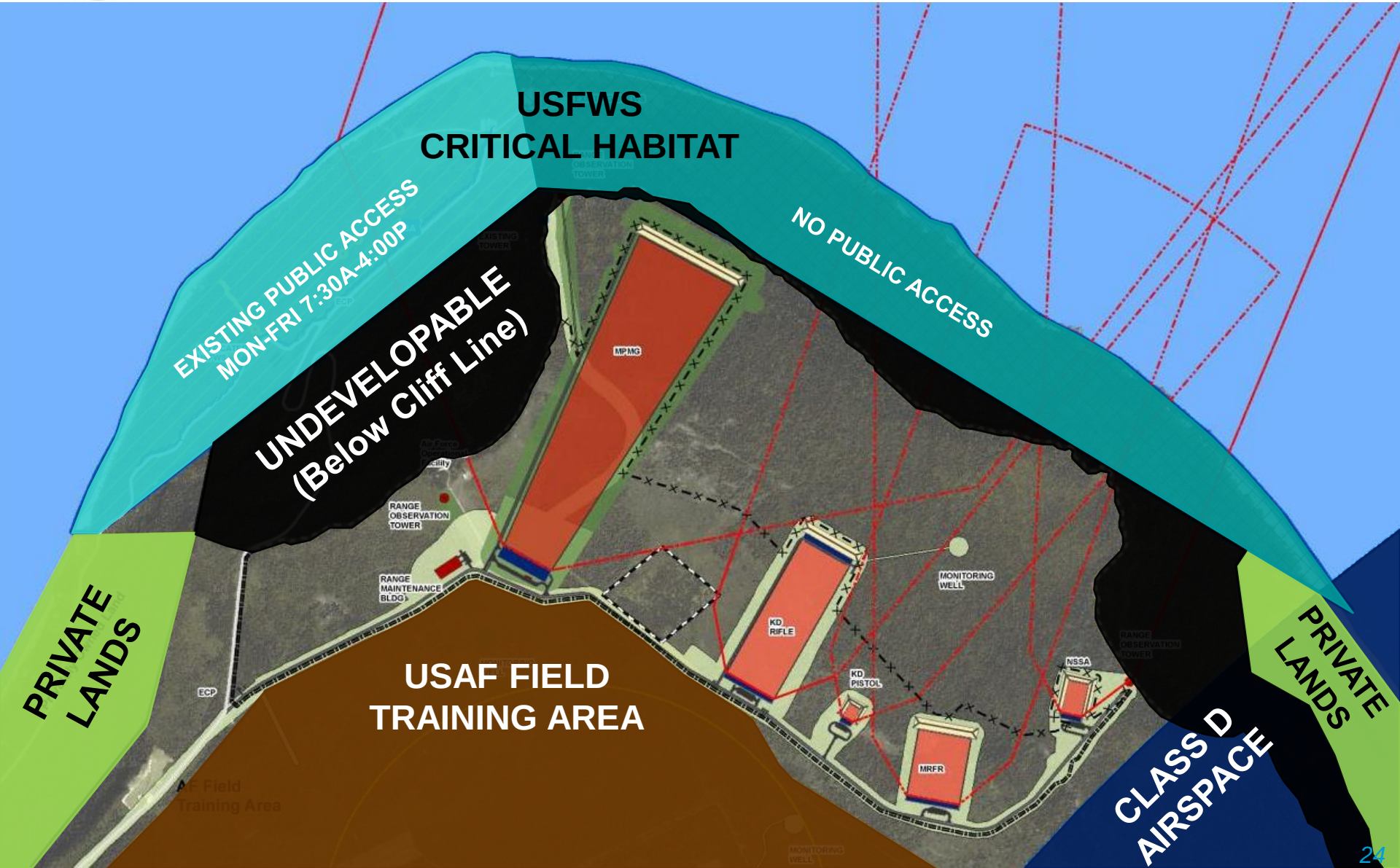
P-715 Known Distance Ranges, Live Fire Training Range Complex, Northwest Field

Construction Award: 24 Aug 2017
Completion: 26 Nov 2020
Award Amount: $78.2M
Contractor: Black Construction

Scope of Work:

- Rehabilitate and widen Route 3A, widen travel lanes, shoulders, and installing appropriate roadside drainage.
- Route 3A rehabilitation is ~ 5 miles.
- Construct/install new water, electrical, and communications utilities required by LFTRC.

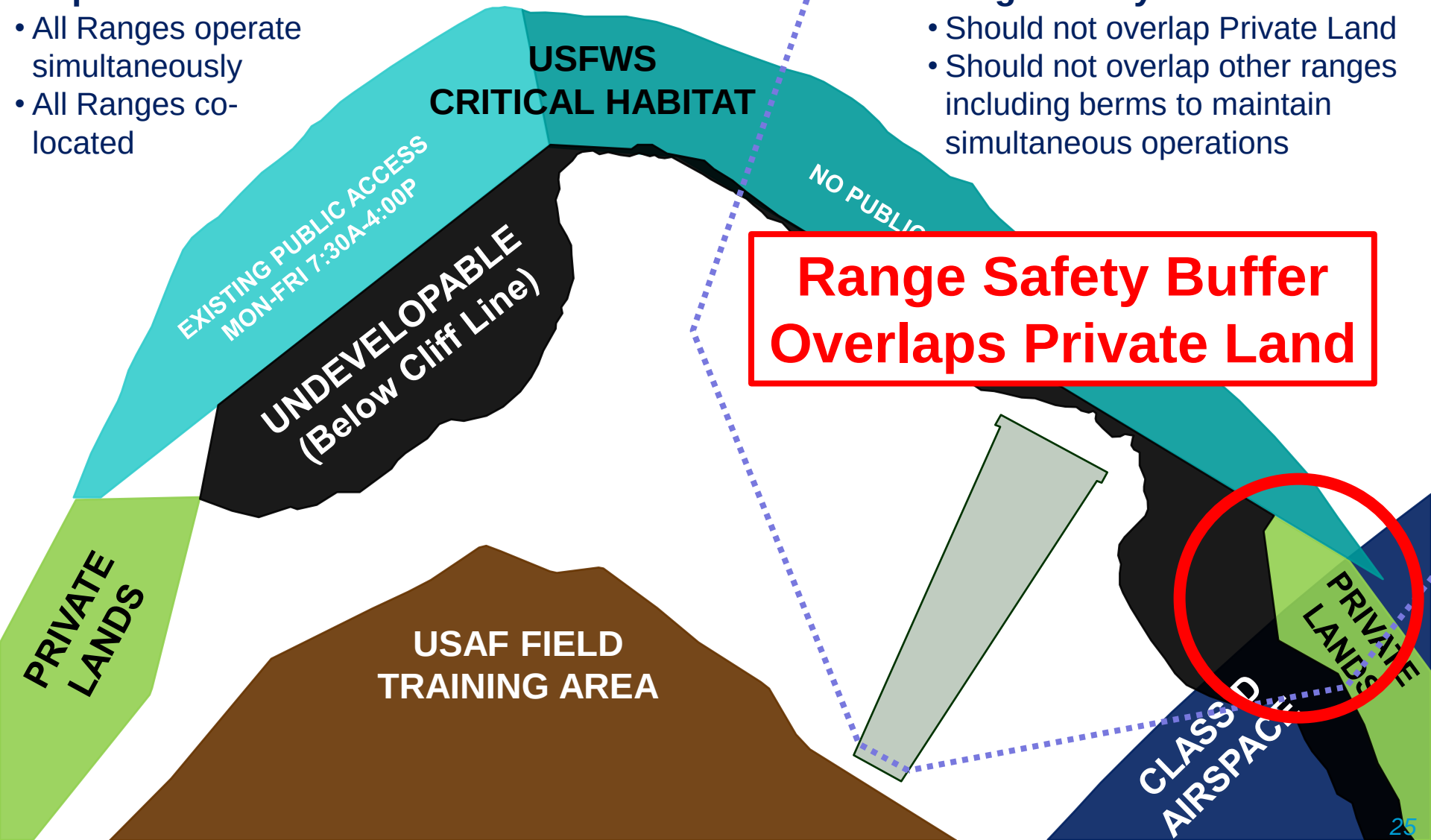
NW Field Range Planning Constraints



NW Field Range Planning Constraints

Requirements:
- All Ranges operate simultaneously
- All Ranges co-located

Range Safety Buffers:
- Should not overlap Private Land
- Should not overlap other ranges including berms to maintain simultaneous operations



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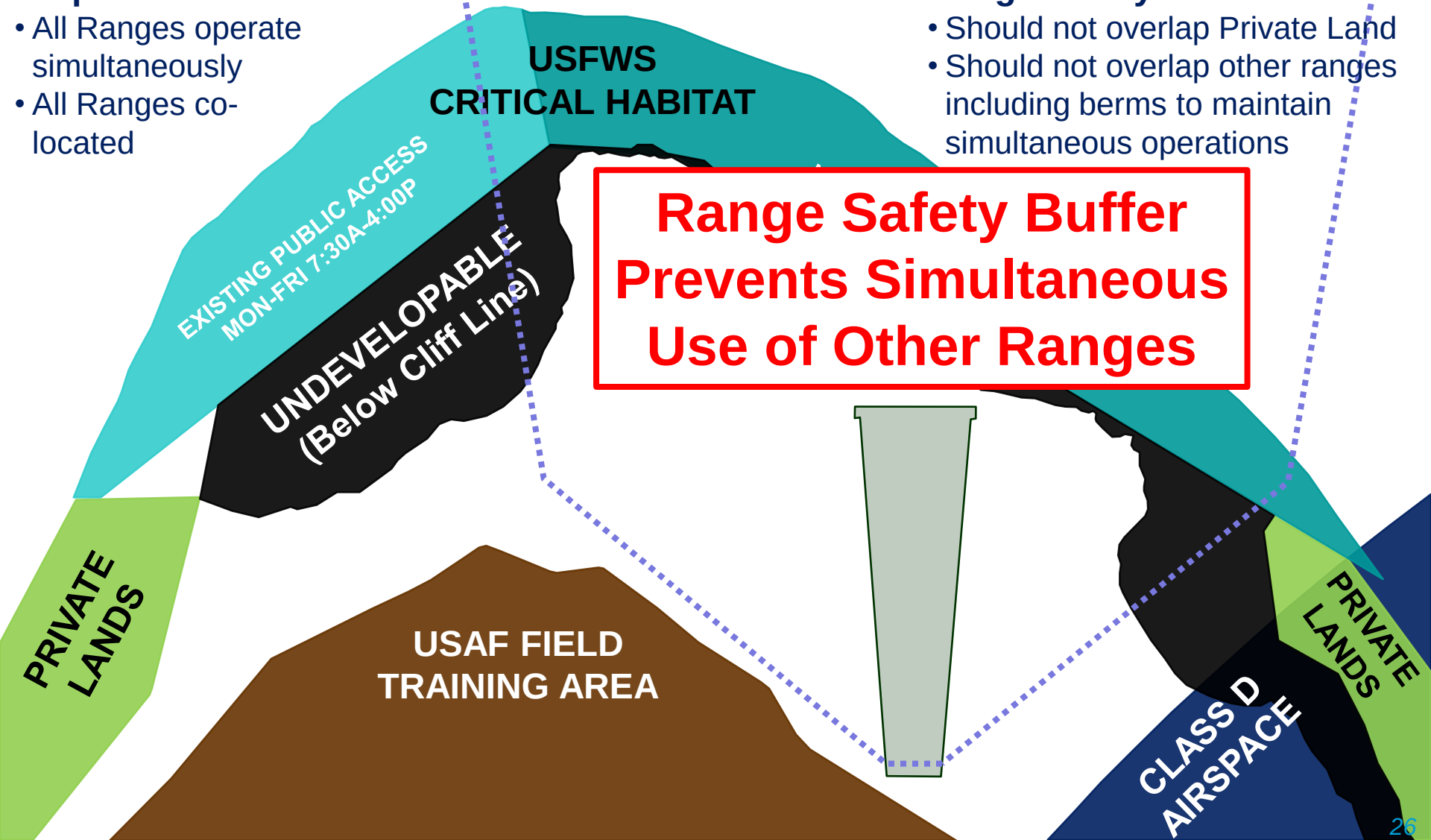

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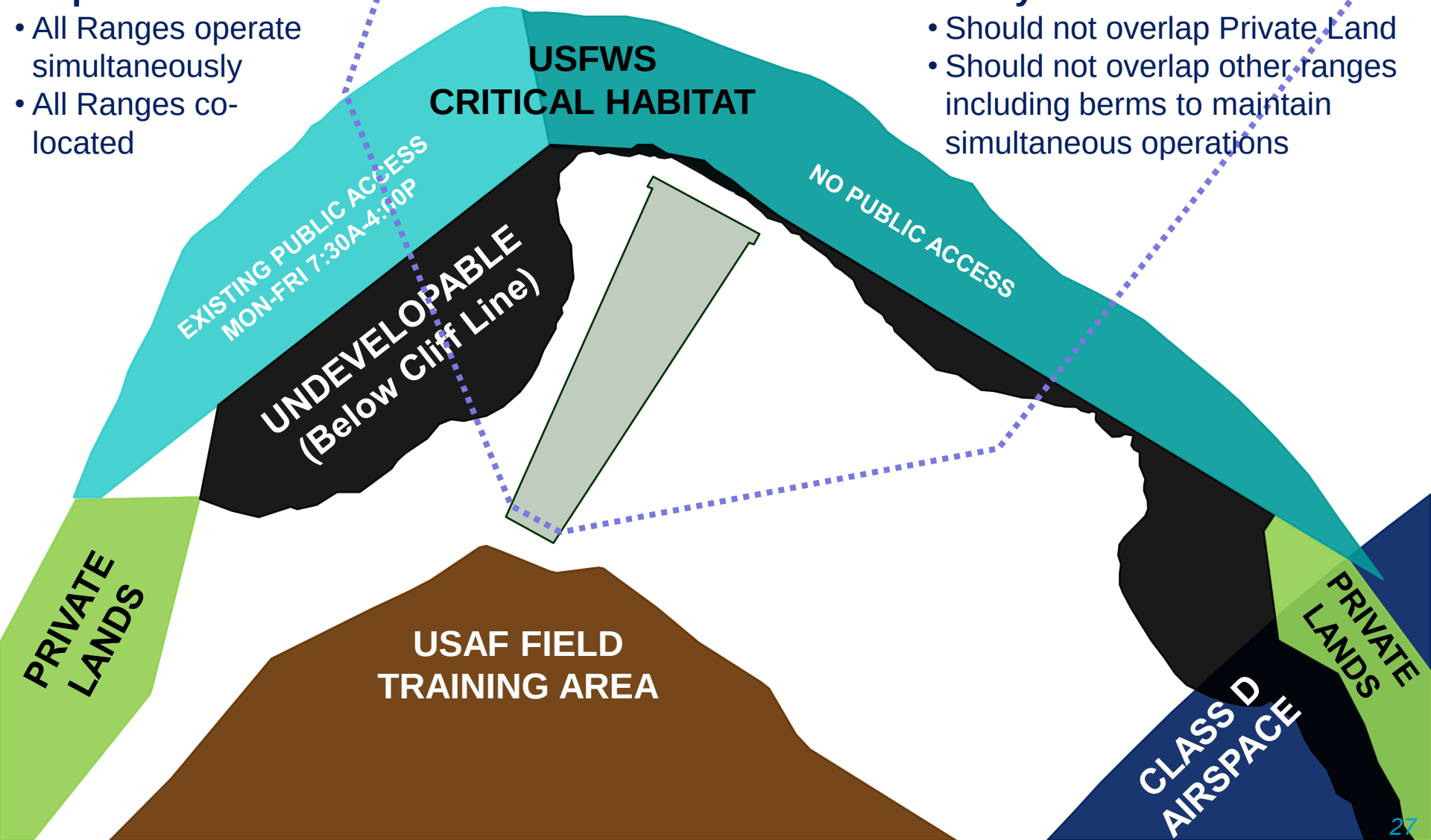

Restricted only During Multi-Purpose Machine Gun Range (MPMG) Activity

Access Change: 11% Coastline with limited access (Only when MPMG Range is Active)

1,688 ft of Shoreline

Ritidian Point

10,596 ft of Protected Shoreline

Existing Prohibited Beach Area

Existing USFWS Restricted Access Area

Public Access 7:30am-4:00pm

4,900 ft of Shoreline

Public Access 7:30am-4:00pm

Multi-Purpose Machine Gun Range

Jinapsan Beach

Existing USFWS Restricted Access Area

2015 SEIS: Live Fire Training Range Use

Guam Ranges	Ammo Type	Est. Annual Usage
Known Distance Rifle	5.56-mm	1,954,964
Known Distance Pistol	9-mm	344,464
Non-Standard Small Arms	5.56-mm	1,160,492
Modified Record of Fire	5.56-mm	444,700
Multi-Purpose Machine Gun	5.56-mm 7.62-mm 0.50-cal 40-mm inert	1,433,988
USMC		**5,338,608 (79%)**
Non-USMC		1,380,582 (21%)
TOTAL		**6,719,190**

Source: Guam and CNMI Military Relocation Final SEIS, Table 2.2-4 (Jul 2015)

Topic 3: Status of Range Environmental Vulnerability Assessment (REVA) program

Speaker: Mr. Gino Tison, MCAG Env. Compliance Program Manager

The LFTRC and Our Actions to Protect the Aquifer

Construction Planning (completed 2016)

Stormwater system design specifications (example for discussion)

During Construction

Hydrogeological assessment	Stormwater system and monitoring well construction	Soil and groundwater sampling	SWPPP implementation

Prior to Operations

REVA baseline assessment

When Range is Operational

Range clearance	Subsequent REVA assessments

**Measures presented in this discussion are real examples of actual protective actions for the range complex, and part of a much larger list of DoD actions to protect all of Guam's water resources*

Construction Planning (completed in 2016)

Stormwater System

Design Specifications

Stormwater System Design

G303006 EROSION & SEDIMENT CONTROL MEASURES

Prior to clearing, grubbing, or other land disturbance, appropriate temporary erosion control measures shall be installed in accordance with local and federal regulations, whichever is more stringent.

G303007 STORM WATER MANAGEMENT

Storm water management shall] comply with UFC 3-210-10, Low Impact Development Manual. The use of Low Impact Development (LID) is required for the project to achieve design objectives stated in DoD Policy on Implementing Section 438 of the Energy and Independence and Security Act (EISA), dated 19 January, 2010 and Department of Navy Low Impact Development (LID) Policy for Storm Water Management, dated 16 November, 2007. The following LID features shall be considered: filter/buffer strips, grassed swales, bioretention swales, wet swales, infiltration trenches. Comply with the UFC 3-210-10 "Low-Impact Development Manual", dated 15 November 2010" and the "CNMI/Guam Stormwater Management Manual, Final – October 2006".

The Contractor shall evaluate the drainage conditions and submit sealed calculations to the Government for civil and environmental review supporting EISA Section 438 and NAVY LID policies have been met in accordance with UFC 3-210-10. Provide a narrative stating project design goals were achieved or to what extent with the sealed calculations. The NAVFAC FEC Commanding Officer shall be the final approval authority for a NAVY LID waiver requests.

Guam EPA's approval for stormwater disposal methods is needed at the 30% and 90% and Final design stages.

The Contractor shall obtain all required regulatory permits required for the proposed work. Coordinate all reports, submittals, and permit applications through the Contracting Officer.

Stormwater System Design

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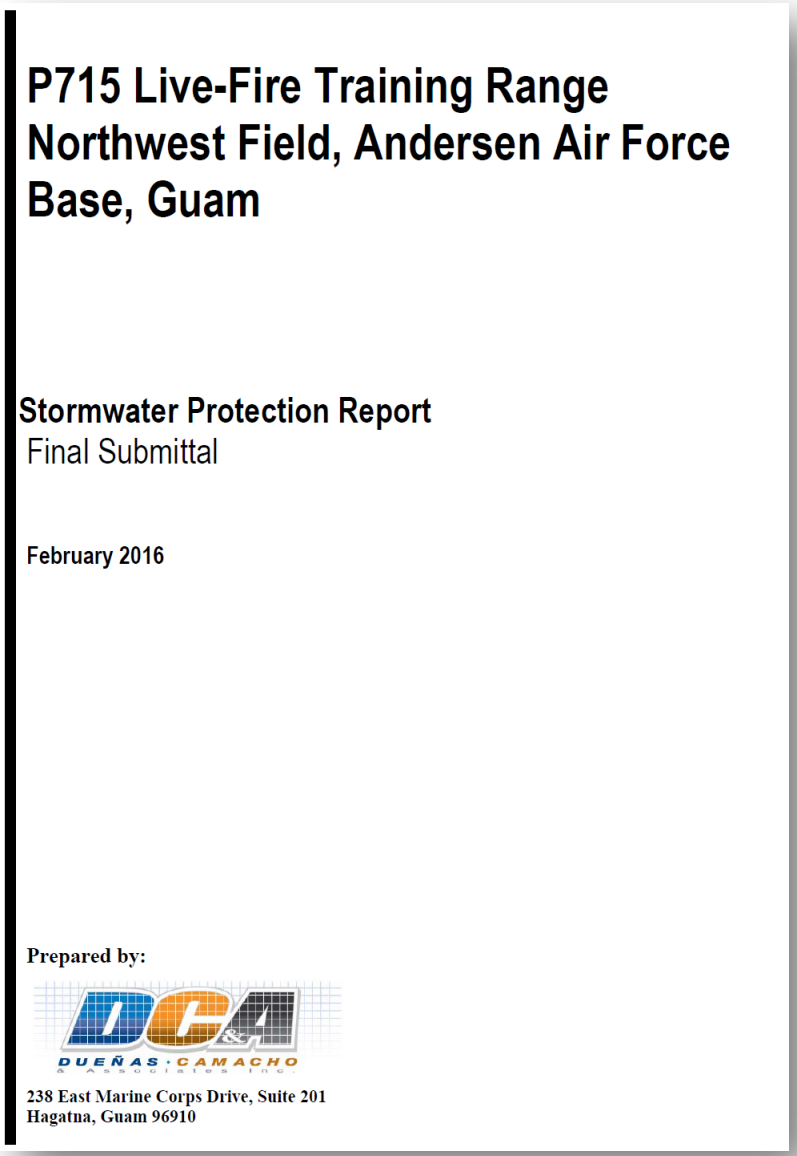
The Contractor shall obtain all required regulatory permits required for the proposed work. Coordinate all reports, submittals, and permit applications through the Contracting Officer.

- Low Impact Development (LID) is aimed to manage large stormwater runoffs using design techniques that would infiltrate, store, and evaporate runoff close to its source or origin
- LID water quality protection measures would control runoff & provide treatment before recharging the aquifer

Stormwater System Design


P715 Live-Fire Training Range
Northwest Field, Andersen Air Force Base, Guam

Stormwater Protection Report
Final Submittal

February 2016

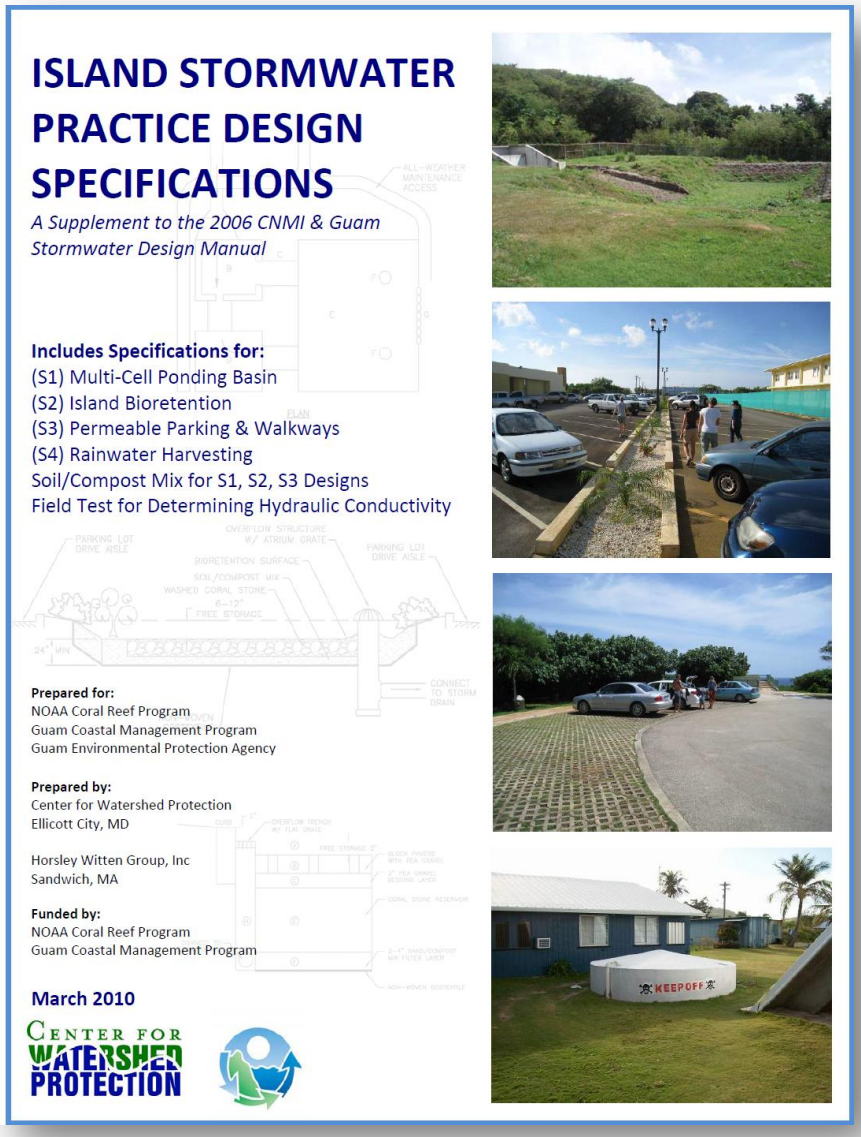
Prepared by:

DUEÑAS · CAMACHO & ASSOCIATES, INC.

238 East Marine Corps Drive, Suite 201
Hagatna, Guam 96910

P-715 Stormwater Protection Report used storm event scenarios to specify criteria & methods for range complex construction designers to achieve adequate recharge to support groundwater levels, water quality objectives, and erosion & flood control

Stormwater System Design



Supplement to *2006 Guam Stormwater Design Manual* provides design guidance on most effective best management practices adapted to the island environment

Stormwater System Design

Multi-cell Ponding Basins

Description: This is a variation on the commonly used ponding basin. It is a multiple-celled system that combines pretreatment, a filter bed, and infiltration to meet all of the required sizing criteria.

Design practices: Multi-cell Ponding Basins (Supplement #1)

KEY CONSIDERATIONS

CONVEYANCE

- Conveyance to the system is typically through energy dissipator.
- Provide low-flow outlet based on WQ_v to vegetated filter bed.
- Provide bypass to infiltration bed for flows larger than the design flow.

PRETREATMENT

- Pretreatment consists of a sedimentation forebay/flow splitter or equivalent practice described in **Section S1.4.**

TREATMENT

- Filter bed should have a soil/compost layer and a 6 - 12" ponding layer.
- Size the treatment area and infiltration bed using equations provided in **Section S1.5.**

LANDSCAPING

- Detailed landscaping plan required.
- Recommended plant list in **Section S2.7.**

MAINTENANCE REQUIREMENTS:

- See maintenance activities and frequencies in **Section S1.8.**

STORMWATER MANAGEMENT SUITABILITY

- ☑ **Water Quality**
- ☑ **Recharge**
- ☑ **Channel Protection**
- ☑ **Overbank Flood**

Accepts Hotspot Runoff: Yes, if filter bed has impermeable liner and underdrain system

IMPLEMENTATION CONSIDERATIONS

- M **Capital Cost**
- M **Maintenance Burden**

Residential/Subdivision Use: *Yes*
High Density/Ultra-Urban: *No*

Drainage Area: *10 acres max.*

Soils: *Soil/Compost Mix created as per specification in the Manual supplement.*

Other Considerations:

Use of native plants is recommended

Key: L=Low M=Moderate H=High

POLLUTANT REMOVAL

- G Phosphorus
- G Nitrogen
- G Metals - Cadmium, Copper, Lead, and Zinc removal
- F Pathogens - Coliform, *Streptococci, E. coli* removal

Key: G=Good F=Fair P=Poor

POLLUTANT REMOVAL

- G Phosphorus
- G Nitrogen
- G Metals - Cadmium, Copper, Lead, and Zinc removal
- F Pathogens - Coliform, *Streptococci, E. coli* removal

Key: G=Good F=Fair P=Poor

Combination of applied LID technologies & compliance with federal and Guam water quality regulations are intended to minimize the potential for adverse impacts to the aquifer due to stormwater

During Construction

Hydrogeological assessment
Stormwater system and monitoring well construction
Soil and groundwater sampling
SWPPP implementation

During Construction

Construction contractor shall:

- Conduct hydrogeological assessment
- Design and construct stormwater system and monitoring wells (will require Guam EPA approval/permits)
- Prepare & implement a Stormwater Pollution Prevention Plan (for US EPA Construction General Permit)

*Although it is the contractor's responsibility to comply with these permits, DoD takes a very active role in partnering with its contractors to ensure that Guam EPA's requirements are met

WELLHEAD PROTECTION SUBMITTALS (SDWA)

APPLICABILITY:

Projects requiring septic tank(s), leach field(s), sanitary sewer, storm water disposal, liquid waste storage/ disposal/treatment located within the Ground Water Management Protection Zone (GWMPZ) and any Wellhead Protection Area (WHPA).

High Risk Activities/Land Uses requiring GEPA approval in WHPAs include -

A. Vehicle Fueling Stations
B. Vehicle Service and Maintenance Facilities
C. Vehicle and Equipment Cleaning Facilities
D. Outdoor Loading or Unloading Facilities (storage, warehouse, commercial)
E. Facilities Generating or Storing Liquid Saste, Solid Waste, or Hazardous Waste
F. Dining/Food Preparation Facilities
G. Engineering Training Pit (outdoor area to train operators using earthmoving or other large equipment)
H. Stormwater Disposal Facilities (unlined stormwater basins)
I. Projects with new exposed parking areas (> 12 stalls)

During Construction

- Contractor shall perform groundwater & soil sampling
- Sampling events shall occur over the course of one year, once in the wet season and once in the dry season
- Results provided to REVA program

GROUNDWATER AND SOIL SAMPLING PARAMETERS AND METHODS

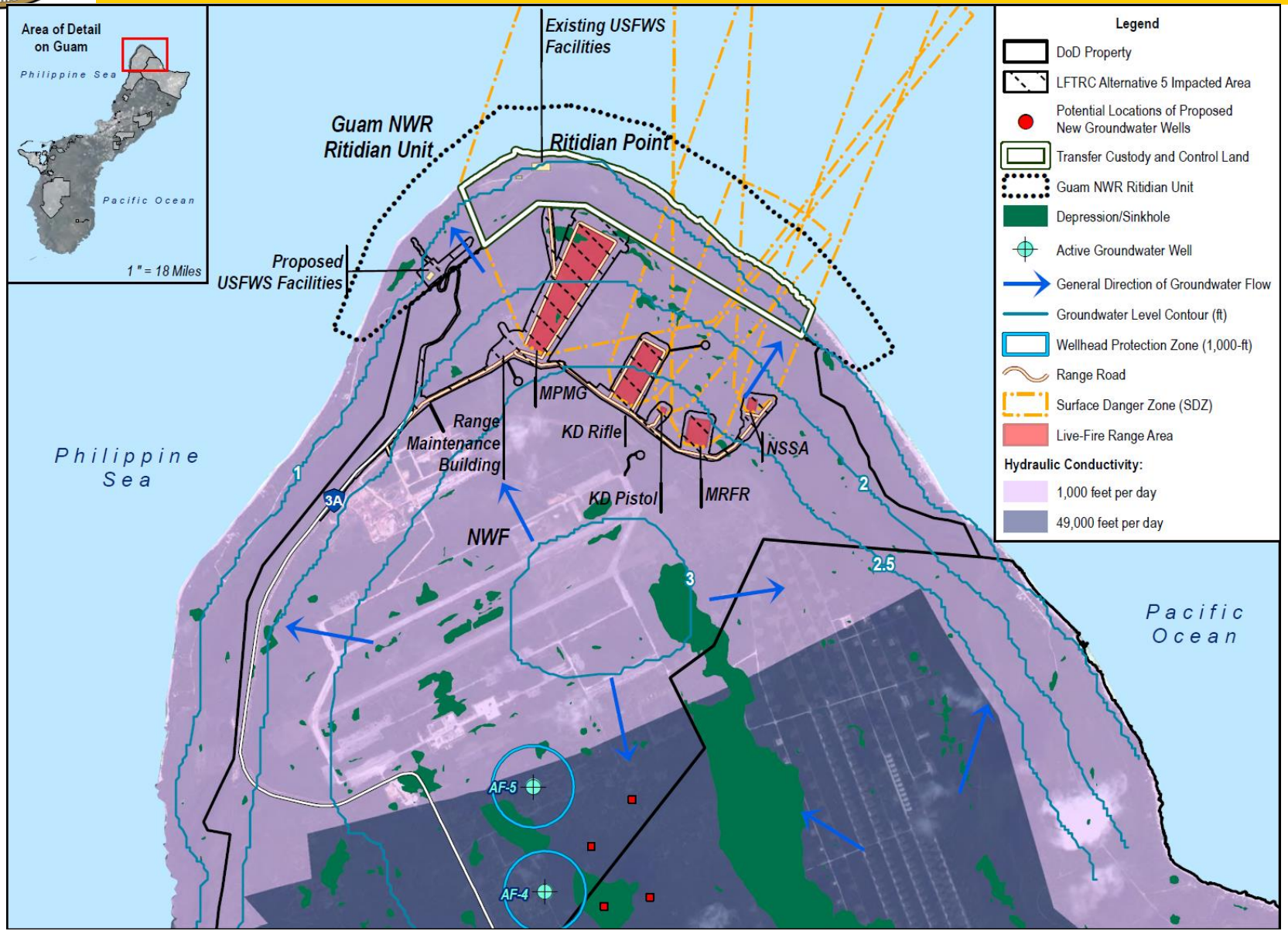
Groundwater Samples					
			Container		
Parameter	**Method**	**Holding Time**	**Volume**	**Type**	**Preservative**
Perchlorate	EPA 6860	28 days	250 mL	Polyethylene	4°C
pH *	SM 4500H+B (lab test)	15 minutes	250 mL	Polyethylene	N/A
ORP	Field test				
Calcium	EPA 200.7/6010B/6020	6 mos.	250 mL	Polyethylene	HNO_3, 4°C
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Potassium					
Sodium					
Zinc					
Alkalinity (as $CaCO_3$)	SM 2320B	14 days	250 mL	Polyethylene	4°C
Sulfate	EPA 300.0	28 days	250 mL	Polyethylene	4°C
Chloride					
* Due to short holding time, recommend using field test for pH.					

Surface Soil Samples					
			Container		
Parameter	**Method**	**Holding Time**	**Volume**	**Type**	**Preservative**
Total Organic Carbon	SW846 9060	28 days	25 g	4 oz. glass jar	4°C
pH	SW846 9045D	14 days	50 g	4 oz. glass jar	4°C
Bulk Density	ASTM D7263-09	N/A	4 oz.	Shelby tube or Ziploc™ bag	N/A
Particle Size	ASTM D422	N/A	4 oz.	Ziploc™ bag	N/A

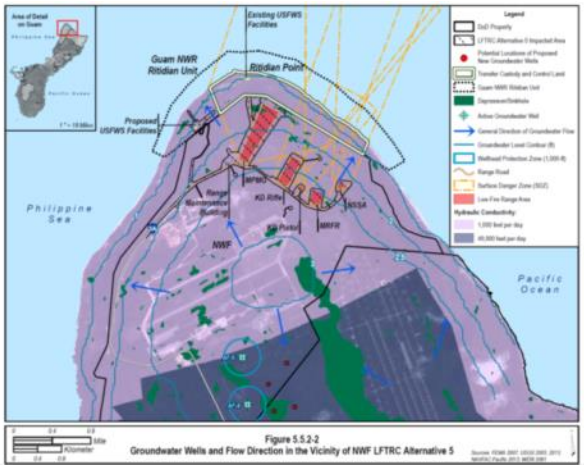
Prior to Operations

REVA baseline assessment

Groundwater Wells & Flow Direction
NW Field Range



Safe Drinking Water



- Groundwater would not flow towards water wells south of the ranges, & the range complex would not pose any risks to drinking water quality
- Ranges are approx. 2 miles from the nearest active groundwater well & about the same distance from future Marine Corps wells
- Drinking water facilities undergo rigorous & periodic sampling, analysis & reporting under the Safe Drinking Water Act

Range Environmental Vulnerability Assessments (REVA)

- Primary goal: Assess the potential for range constituents to migrate off-range, and identify potential impacts to human health and the environment
- Administered by Headquarters, Marine Corps at 250+ ranges all over the world; process is consistent across all these ranges

FACTSHEET **REVA Overview**

Marine Corps' Range Environmental Vulnerability Assessment (REVA) Program

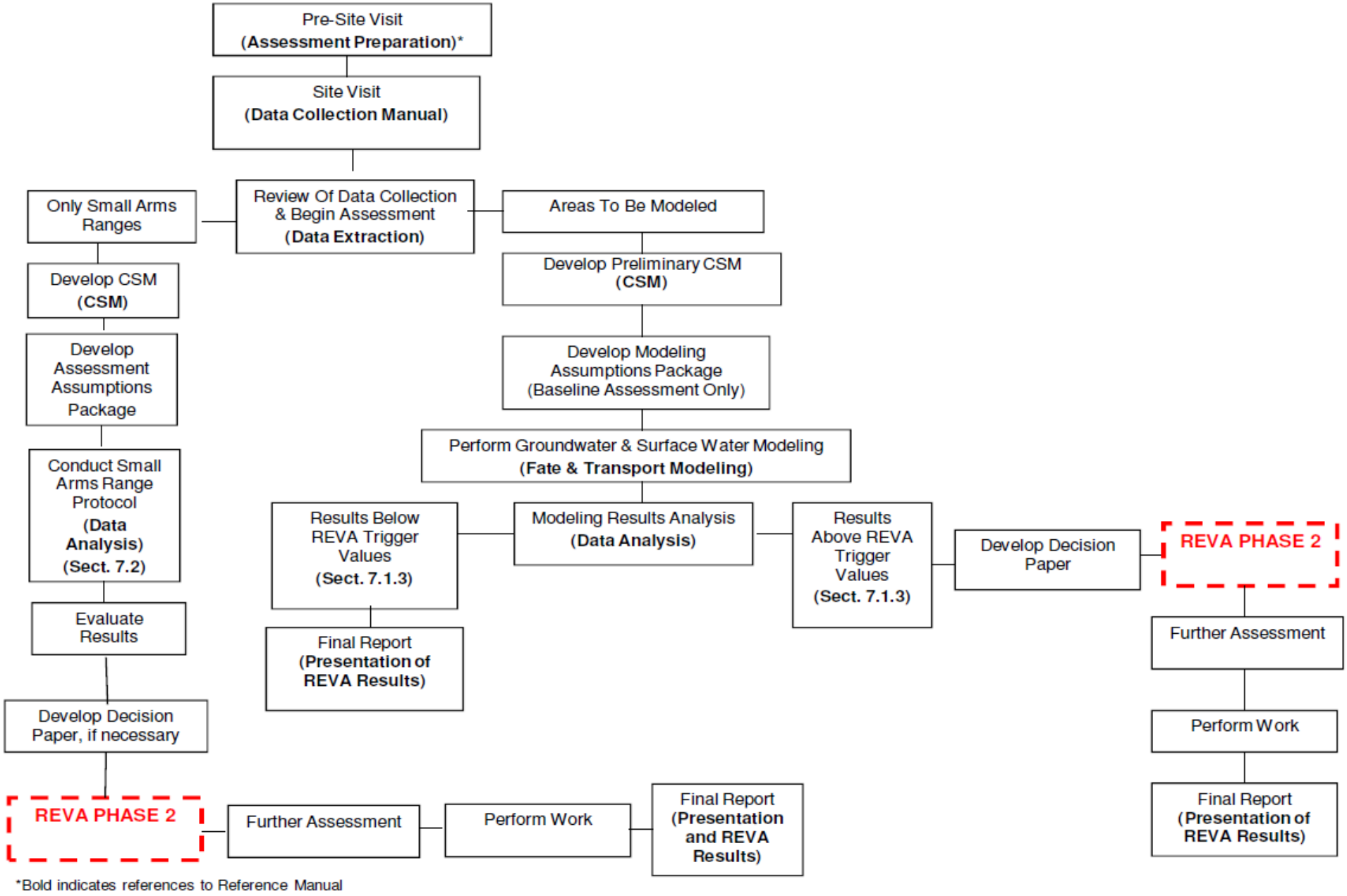


Figure 1.4-1: REVA Process Flow Diagram

REVA Process

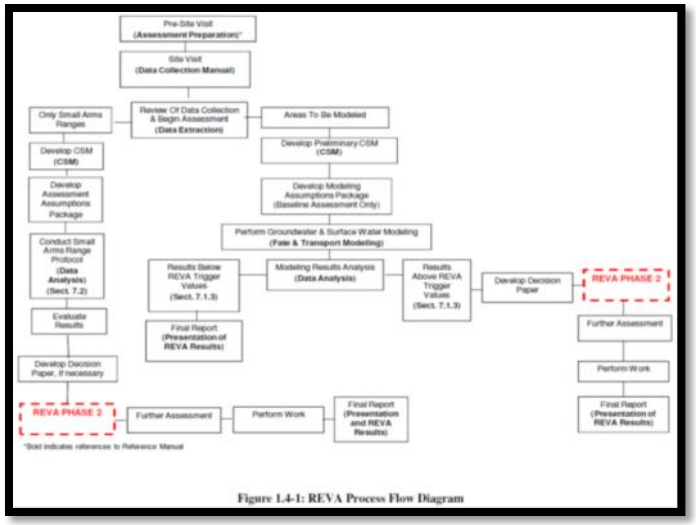
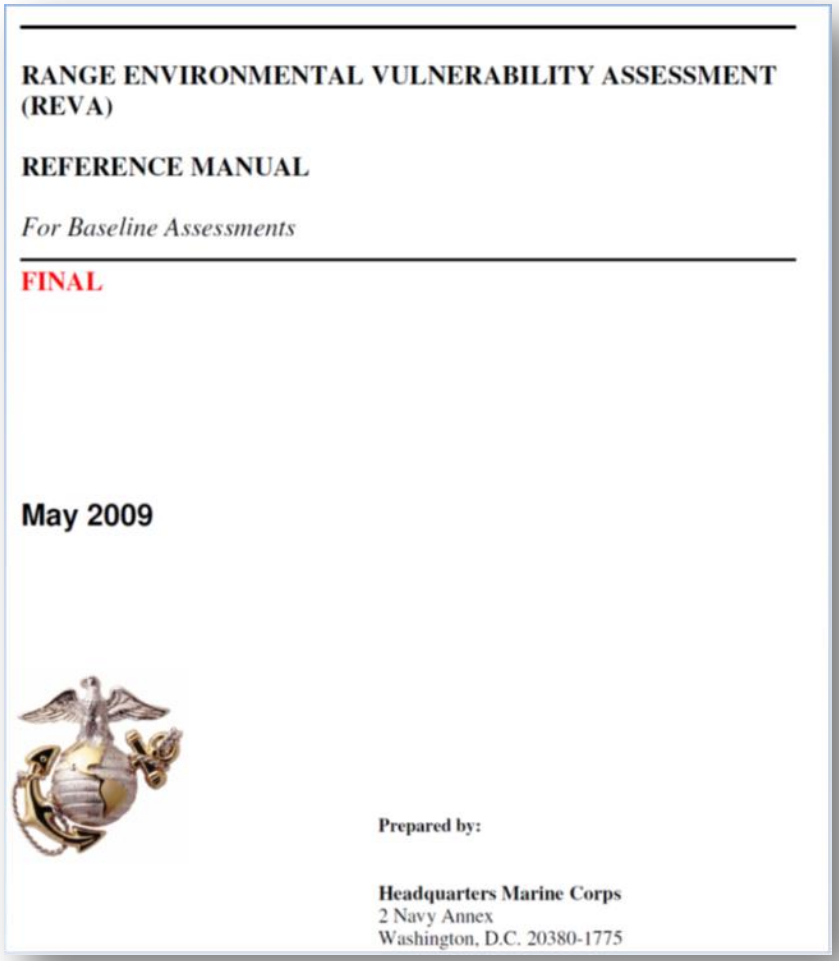


Figure 1.4-1: REVA Process Flow Diagram

REVA would look at three groups of data to develop their site model:

- Site-specific info (e.g. topography, yearly precipitation, groundwater flow, soil & water chemistry)
- Constituent migration pathways & potential receptors (e.g. wells, habitat)
- Conservative estimates of projected amounts of bullets to be fired at the range

REVA Stakeholder Involvement



RANGE ENVIRONMENTAL VULNERABILITY ASSESSMENT (REVA)

REFERENCE MANUAL

For Baseline Assessments

FINAL

May 2009

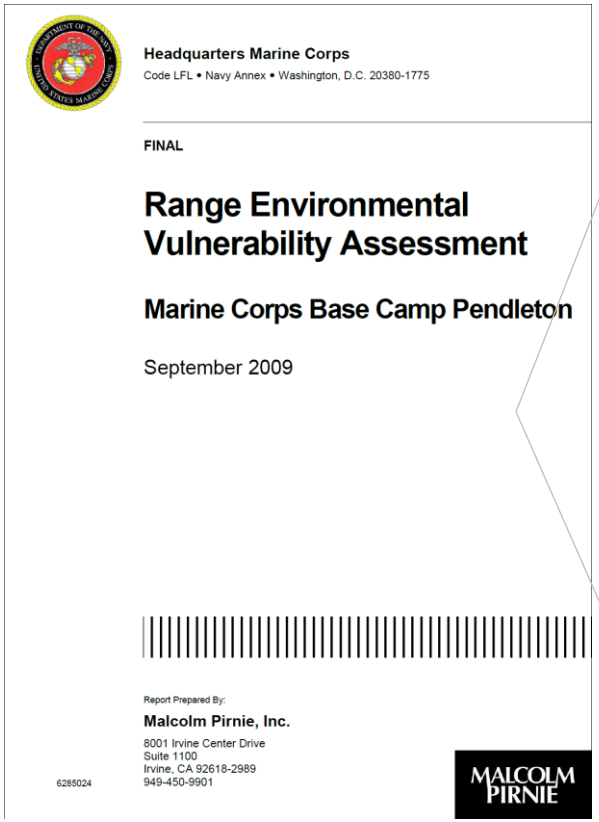
Prepared by:

Headquarters Marine Corps
2 Navy Annex
Washington, D.C. 20380-1775

- Marine Corps will provide all draft final baseline reports to stakeholders 60 days prior to report finalization
- Stakeholders: Guam Water Resources Development Group (GWRDG) consisting of Guam EPA, GWA, CCU, WERI & DoD

REVA Stakeholder Involvement

Baseline assessments will be made available to the public on a DoD-hosted website



Headquarters Marine Corps
Code LFL • Navy Annex • Washington, D.C. 20380-1775

FINAL

Range Environmental Vulnerability Assessment

Marine Corps Base Camp Pendleton

September 2009

Report Prepared By:
Malcolm Pirnie, Inc.
8001 Irvine Center Drive
Suite 1100
Irvine, CA 92618-2989
949-450-9901

6285024

MALCOLM PIRNIE

Although the MC concentrations were predicted below levels of potential concern, the Marine Corps conducted field sampling activities at off-range surface water and groundwater locations down gradient of the primary MC loading areas in the San Onofre and Las Flores watersheds. The field sampling was conducted to determine whether actual MC migration had occurred as well as provide a general, although not direct, confirmation of the modeling results. Trace concentrations of MC were detected in both watersheds below screening values identified by DoD to assess impact to human health and environment, with one exception for a slight exceedence of an ecological screening value. Nevertheless, to ensure the sustainability of MCB Camp Pendleton operational ranges, options for further management and assessment are being considered for high priority ranges identified through this REVA baseline assessment. In addition, subsequent vulnerability assessments will be conducted on operational ranges at MCB Camp Pendleton on a five-year cycle or when significant changes are made to existing operational ranges that potentially affect the determinations made during this baseline assessment, as described in the *REVA Reference Manual* (HQMC, 2006).

http://denix.osd.mil/sri/policy/reva/baseline/mcb-camp-pendleton/

During Range Operations

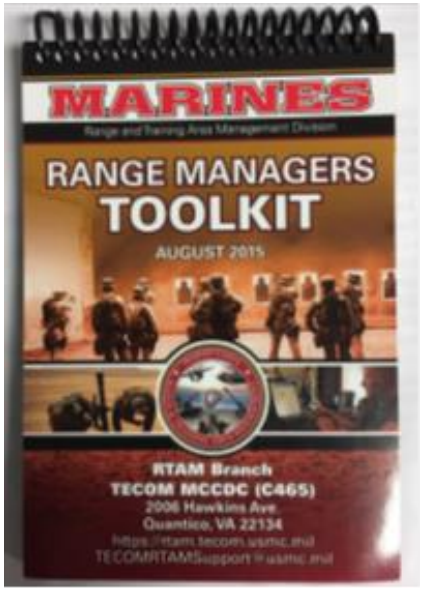
Operational Range Clearance

Subsequent REVA assessments

Operational Range Clearance (ORC)

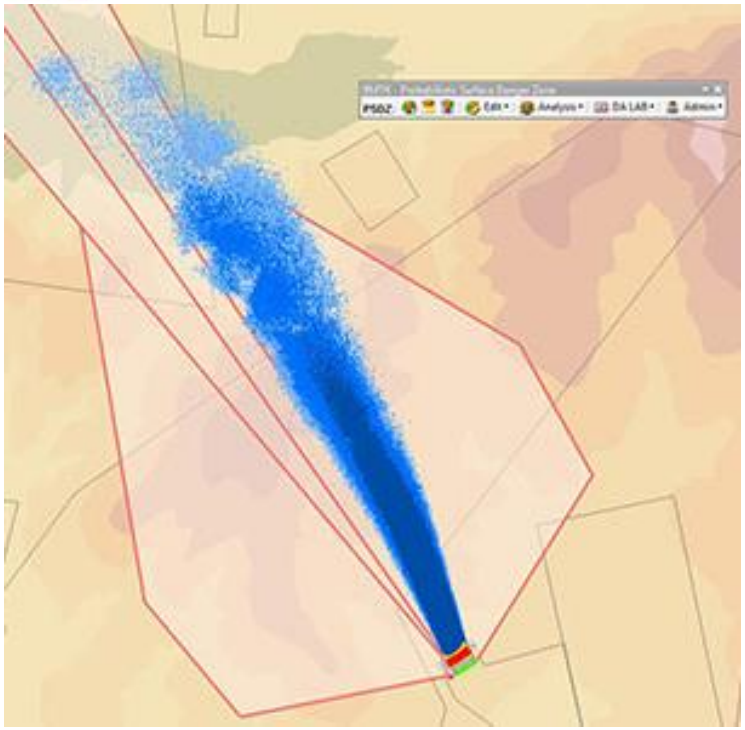
Example of shaker system.
Courtesy of National Range Recovery

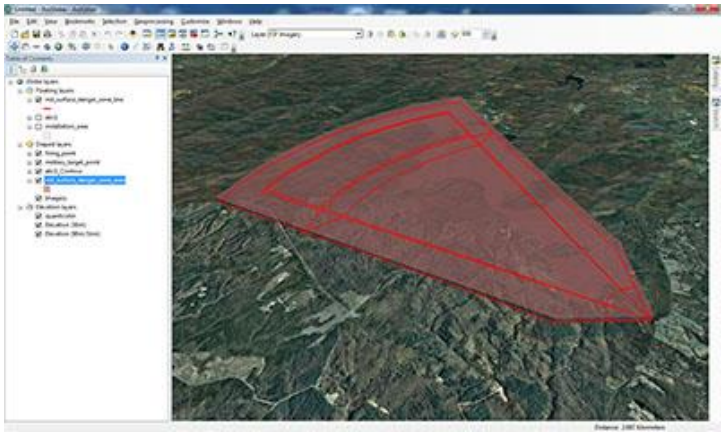
Example of final separation device
(Patented Pneumatic Separation Unit) used with a Shaker System. Courtesy of MARCOR.



- Removal/proper disposition of bullets, casings & other range-related debris
- Removes the source of potential contamination of the aquifer
- Materials recovered are NOT waste – metals are also derived from finite resources, hence these would be recycled

ORC and REVA





- Amount of expenditures at the range will be tracked
- Findings from REVA along with expenditure rate determine range clearance frequencies
- Subsequent REVA assessments will be conducted every 5 years to verify whether baseline report still represents actual conditions at the range complex

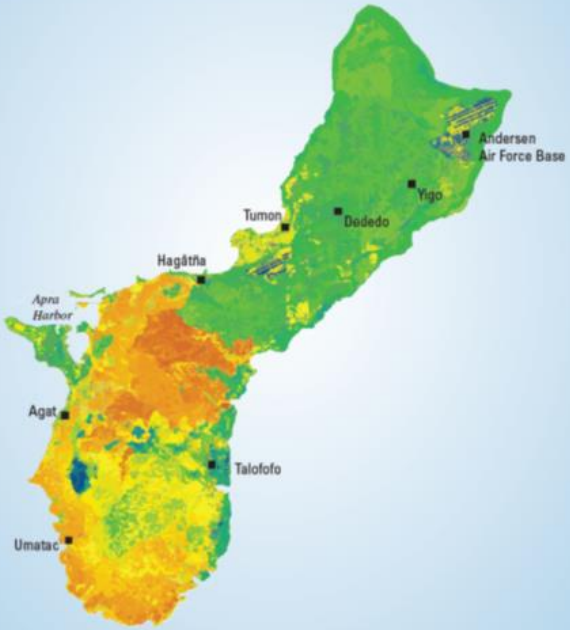
Broader Actions

Marine Corps-Funded Studies

USGS
science for a changing world

Prepared in cooperation with the United States Marine Corps

A Water-Budget Model and Estimates of Groundwater Recharge for Guam



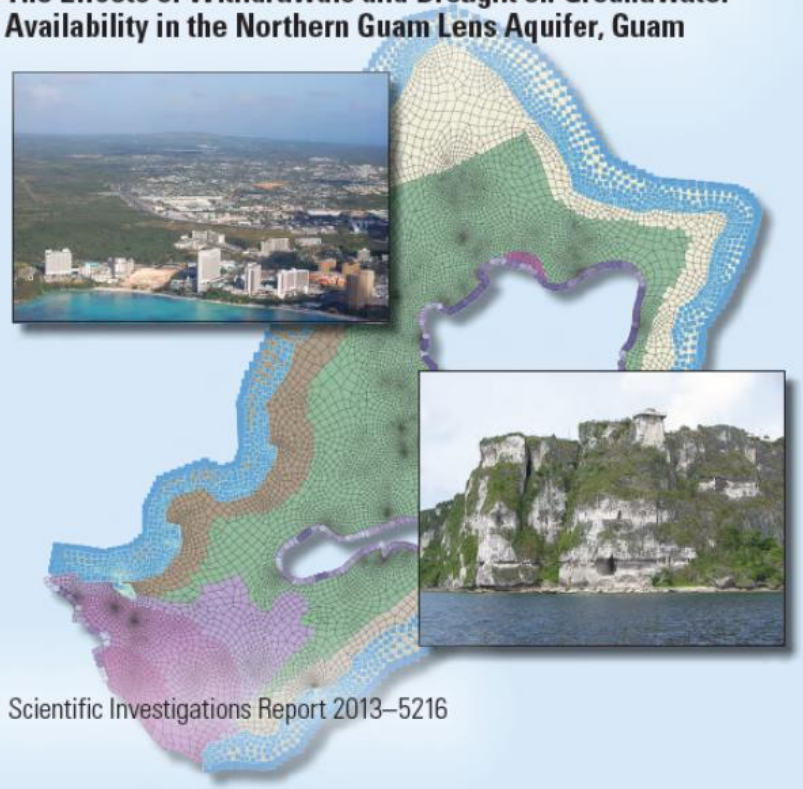
Scientific Investigations Report 2012–5028

U.S. Department of the Interior
U.S. Geological Survey

USGS
science for a changing world

Prepared in cooperation with Headquarters, United States Marine Corps

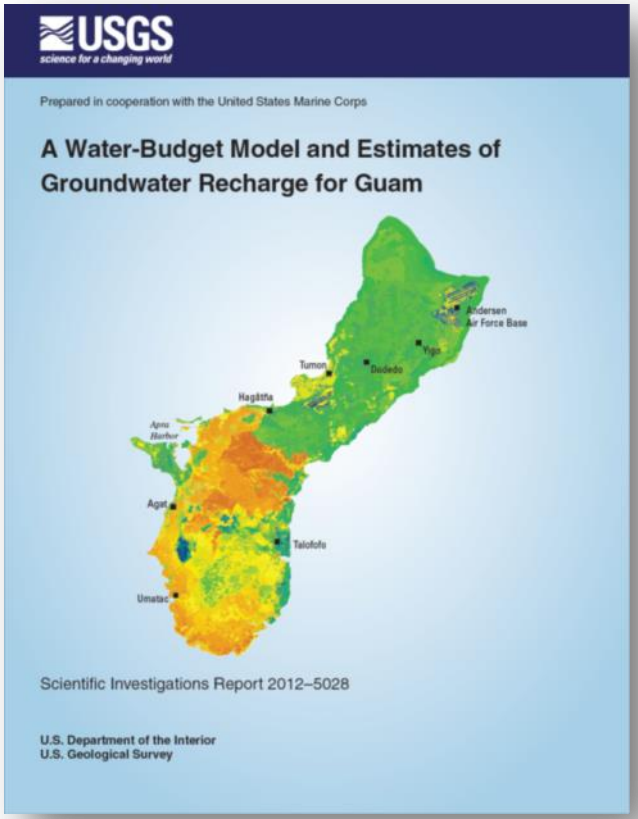
The Effects of Withdrawals and Drought on Groundwater Availability in the Northern Guam Lens Aquifer, Guam



Scientific Investigations Report 2013–5216

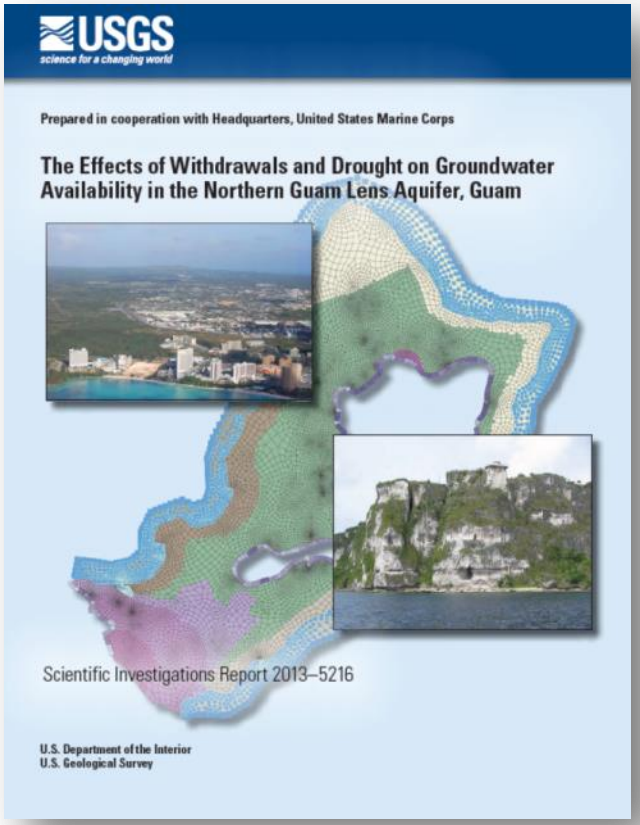
U.S. Department of the Interior
U.S. Geological Survey

Marine Corps-Funded Studies



"For the future land-cover water-budget simulation, which represents potential land-cover changes owing to the military relocation and population growth, estimated recharge for the entire island is nearly equal to the baseline recharge estimate that was based on 2004 land cover" (USGS 2012)

Marine Corps-Funded Studies



- 2013 study developed a numerical groundwater model as a tool in estimating the effects of pumping & climate on the water supply
- Model has limits due to uncertainties regarding actual conditions
- USGS & WERI identified that rehabilitation & expansion of the hydrologic data collection network would be necessary to ensure sustainable management of the aquifer

The One-Guam Aquifer Monitoring Program

A program to provide basic hydrologic data needed for effective management of Guam's drinking-water resources

Collaborative effort between the
University of Guam
Water and Environmental Research Institute
of the Western Pacific and the
U.S. Geological Survey
Pacific Islands Water Science Center

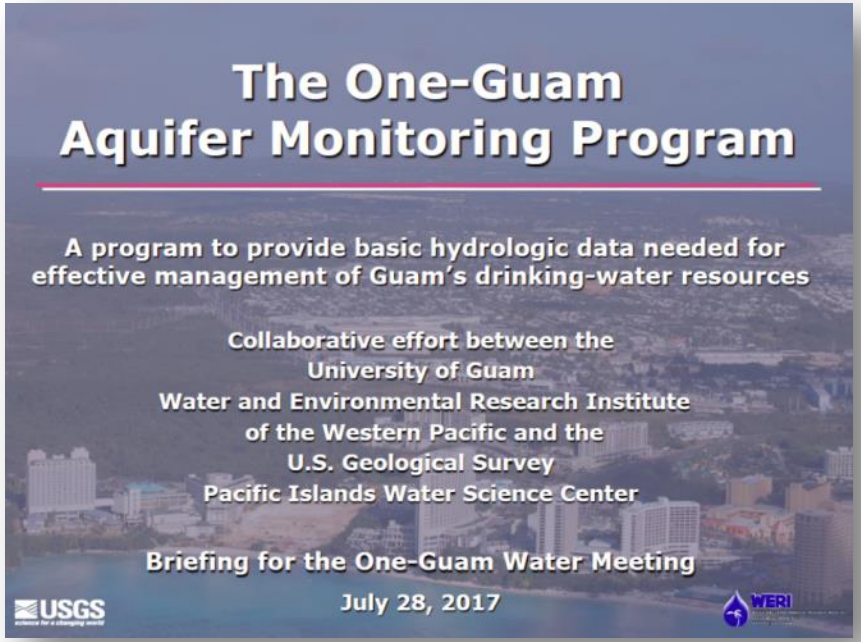
Briefing for the One-Guam Water Meeting

July 28, 2017

USGS science for a changing world

WERI

One-Guam Aquifer Monitoring Program



- DoD's Office of Economic Adjustment awarded a $3.7M grant to GWA to expand the aquifer's monitoring network
- USGS & WERI to provide technical support
- Will provide long-term data needed effective management of Guam's drinking water resources

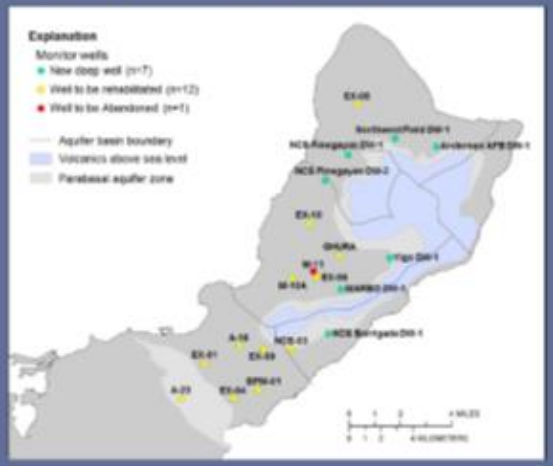
Background

- Since 1998, WERI has administered with support from the Guam Legislature and USGS
  - Guam Hydrologic Survey: PL 24-247
  - Comprehensive Water Monitoring Program: PL 24-161
- In 2013, USMC funded groundwater modeling study concluded
  - Increased withdrawals from the aquifer may result in locally significant increases in salinity, especially during droughts
- In 2014, WERI and USGS recommended expanded hydrologic monitoring of the Northern Guam Lens Aquifer
  - Existing network of monitor wells is not sufficient and upgrades to existing wells are needed
  - Proposal submitted to DoD, USEPA, and GWA (update in progress)

USGS WERI

Well-Infrastructure Improvements

1. Install 7 new deep-monitor wells in areas with little or no coverage (4 of 6 groundwater basins)



2. Rehabilitate 12 existing wells, including repair of deteriorating steel casing

3. Abandon 1 well (M11)

USGS WERI

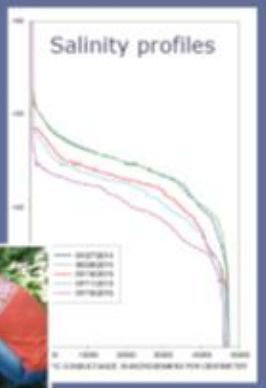
Background

- In 2016, OEA granted $3.7M to GWA for critical infrastructure improvements needed for expanded hydrologic monitoring
  - GWA has a Program Manager for execution of the grant
- In 2017, GWA will enter into a MOA with the University of Guam for WERI and USGS to provide technical assistance for the One-Guam Well Install. and Rehab. Project (OGWIRP)

USGS WERI

The One-Guam Aquifer Monitoring Program (OGAMP)

Provide long-term hydrologic data and information needed for effective management of Guam's drinking-water resources



Quarterly site visits

USGS WERI

NW Field 1945

Topic 4: Update on activities under the Programmatic Agreement

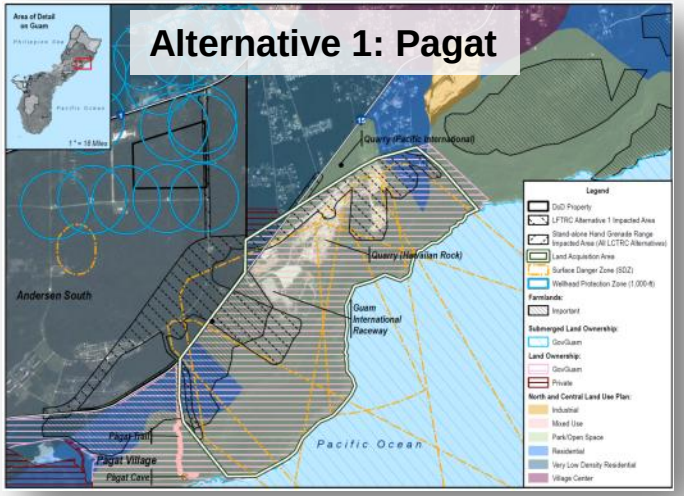
Speakers: Mr. Shawn Arnold, JRM Designated Cultural Resources Manager
Mr. Ronnie Rogers, MCAG Cultural Resources Specialist

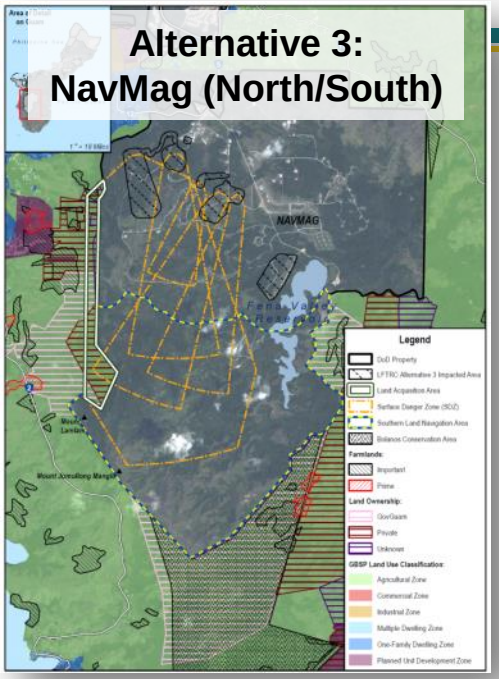
Why Northwest Field

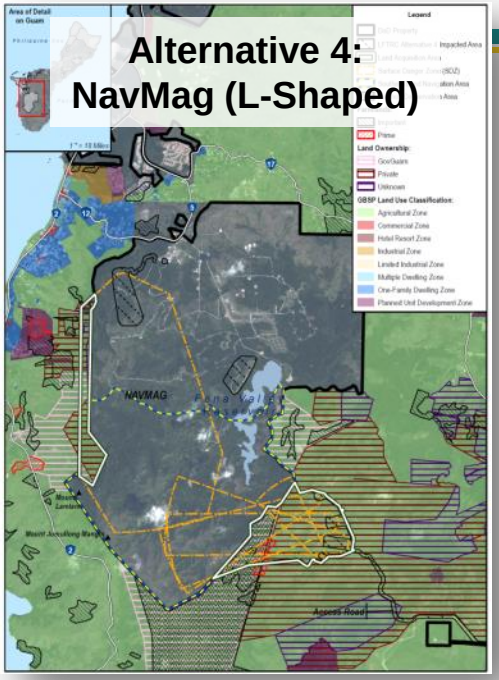
5 Range Alternatives were considered at 3 locations:

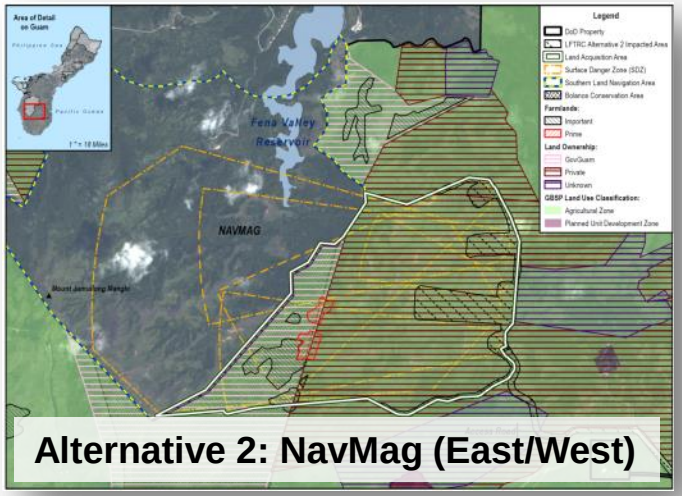
- Naval Magazine
- Route 15
- Northwest Field

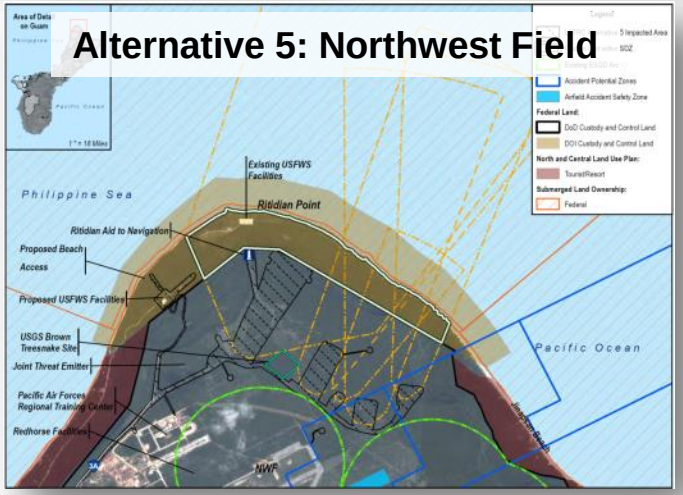
2015 Live Fire Training Range Alts

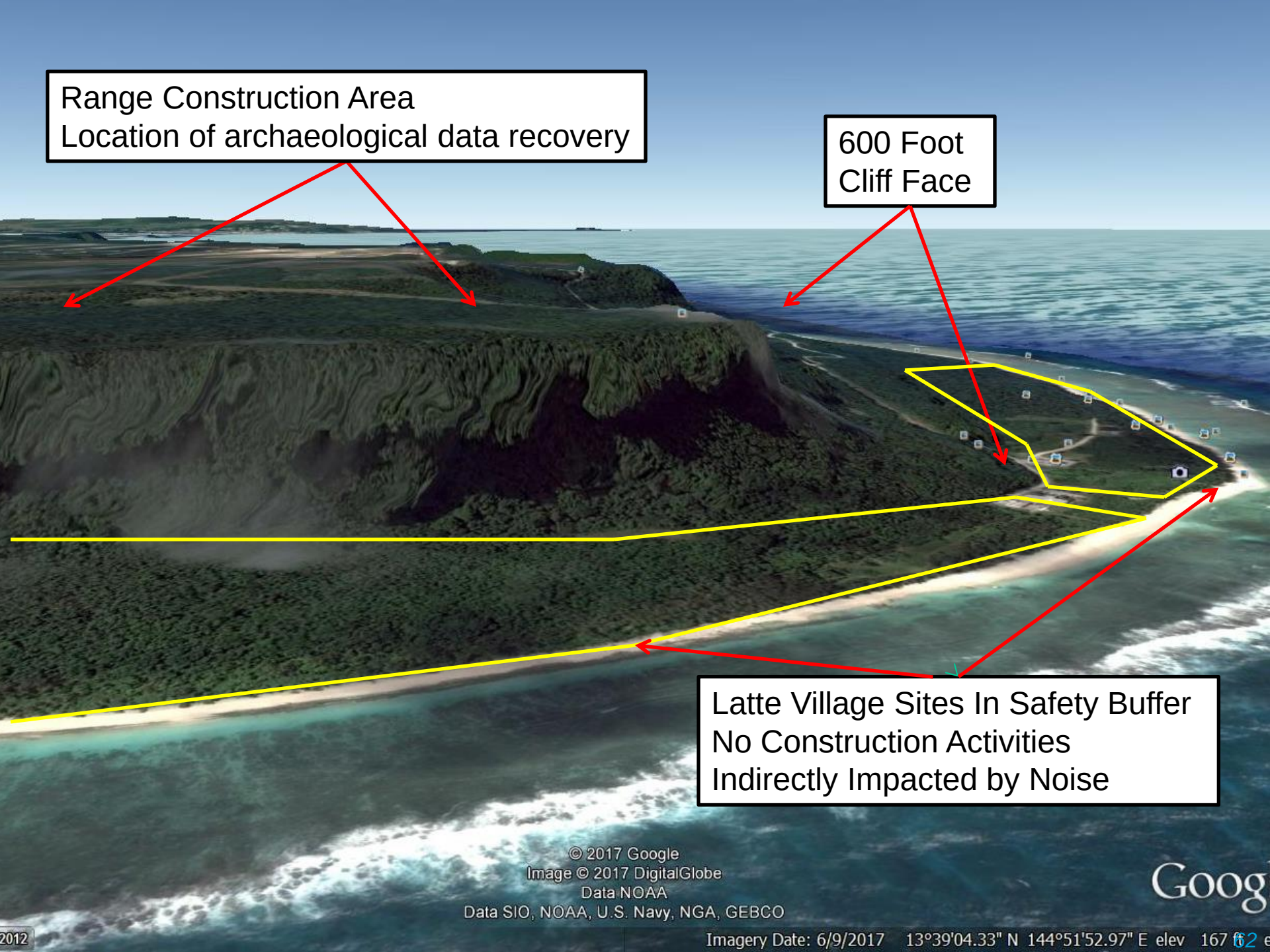











Range Construction Area
Location of archaeological data recovery
600 Foot
Cliff Face
Latte Village Sites In Safety Buffer
No Construction Activities
Indirectly Impacted by Noise
© 2017 Google
Image © 2017 DigitalGlobe
Data NOAA
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Imagery Date: 6/9/2017 13°39'04.33" N 144°51'52.97" E elev 167 ft

Areas Archeologically Surveyed around NW Field

Public Participation in Archaeological Consultation Process

- During the public comment period for the Draft SEIS, individuals from GovGuam and Federal agencies, non-governmental organizations, and the public commented on cultural resources issues related to the LFTRC. Comments collected during the Draft SEIS review period were taken into account as part of the DON's consideration of the proposed action.

- On October 22, 2014, the DON made the Draft Training Range Review and Analysis (TRRA) available for a 45-day comment period to the public and those Local and Federal agencies and non-governmental organizations that participated in the 2011 PA consultations. The review period ended on December 9, 2014, Chamorro Standard Time.

- To initiate the Draft TRRA review period, the DON emailed copies to the PA Parties, and a public version was made available via Naval Facilities Engineering Command (NAVFAC) Pacific's Cultural Resource Information and JRM websites. The DON also provided hard copies of the public version of the Draft TRRA to the Guam SHPO office for dissemination to the interested public. The availability of the Draft TRRA and the reminder of the review period timelines were announced in the NAVFAC public service announcements.

Public Participation in Archaeological Consultation Process

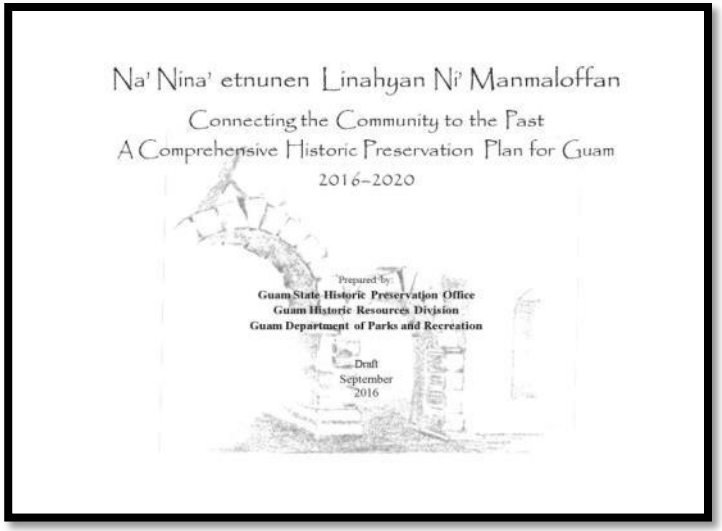
- During the Draft TRRA review period, the DON held three consultation meetings/calls with the 2011 PA Parties to identify the Parties' key issues and concerns with the Draft TRRA. The PA Parties provided their comments during the meetings/calls and followed up with written comments. The DON received written comments from PA Parties. DON also received comments from 11 public commenters via NAVFAC Pacific's cultural resource information website.

- The DON reviewed and addressed the comments on the Draft TRRA. Consultations on the TRRA contributed to the development of the Range Mitigation Plan (RMP) for historic properties in the LFTRC alternative selected in the ROD.

List of PA Compliance Actions

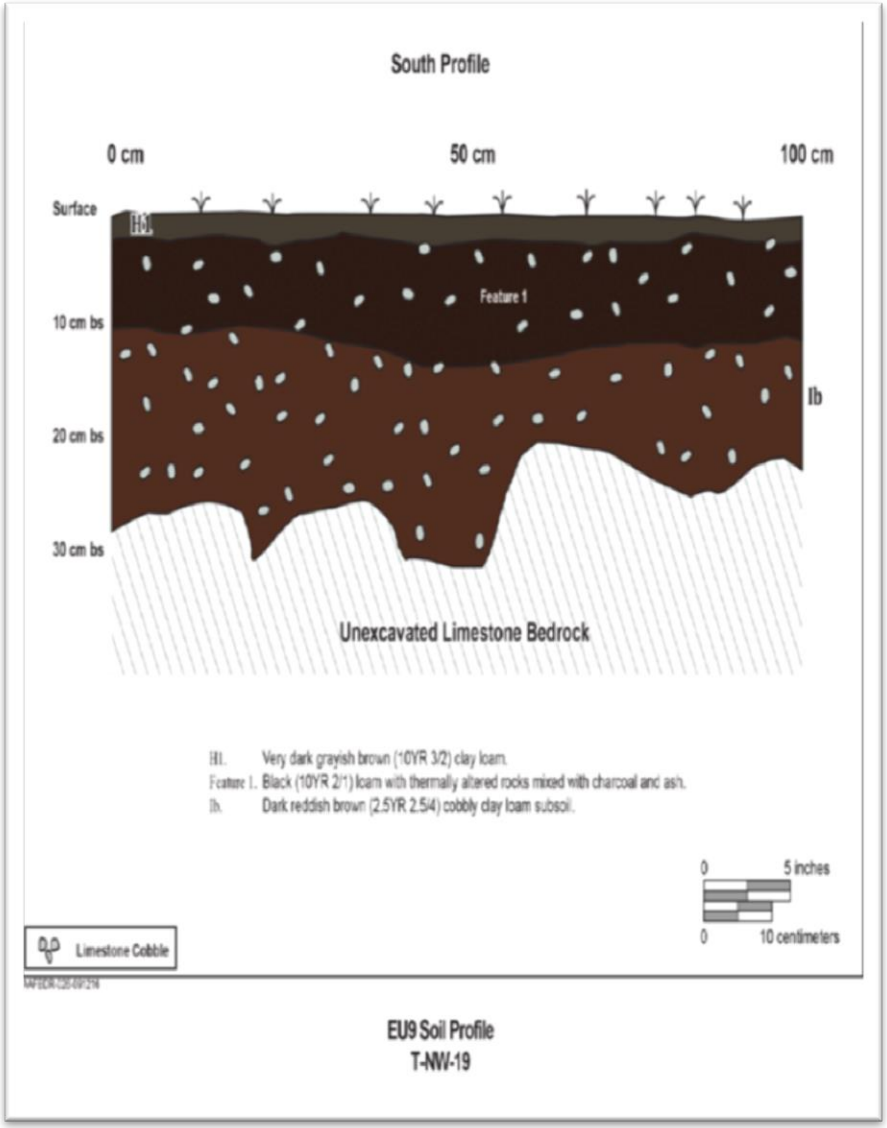
- ✓ Technical Archaeological reports
- ✓ Public information booklets
- ✓ Public Access Plan
- ✓ Guam SHPO Liaison to assist SHPO
- ✓ Guam Comprehensive Preservation Plan
- ✓ Island-wide synthesis of archaeological information
- ✓ Professional staff to oversee the relocation project
- ✓ Semi-annual reports
- ✓ Annual workshops
- ✓ Guam Cultural Repository

Construction Mitigations



Archaeological Sites in Range Construction Area

Archaeological Sites in Range Construction Area



EU9 Soil Profile
T-NW-19

Archaeological Data Recovery

- The 2011 PA stipulates that for sites that are purely archaeological in nature, data recovery will be the mitigation of adverse effects

- Preferred Management Practices
  - Avoidance and Preservation in Place
  - Minimize adverse effects
  - Recover the information by data recovery
  - Preserve the records and artifacts for the future