CITY OF SAN ANTONIO

DEVELOPMENT SERVICES DEPARTMENT
1901 S. Alamo, San Antonio, TX 78204

ADMINISTRATIVE EXCEPTION/VARIANCE REQUEST APPLICATION

Project Name:	Castleridge/Slick Ranch Creek Mitigation Project
A/P # /PPR # /Plat #	City of San Antonio Project Number 23-01484
Date:	August 24, 2022
Code Issue:	Increase in 1% AC water surface elevation greater than 6"
Code Sections:	35-F124(c)(3)

Submitted By:	☑ Owner	☐ Owners Agent * (Requires notarized Letter of Agent)
Owners Name:	Victoria Escobedo, PE, Project Manager	
Company:	City of San Antonio, Public Works Department	
Address:	100 W. Houston St., 15th Floor | San Antonio, TX	**Zip Code:** 78205
Tel #: 210.207.5013 **Fax#** 210.207.4406	**E-Mail:** victoria.escobedo@sanantonio.gov	
Consultant:	Brandon Hilbrich, PE, CFM	
Company:	HDR Engineering, Inc.	
Address:	613 NW Loop 410, Suite 700, San Antonio, TX	**Zip Code:** 78216
Tel #: 210.841.2835 **Fax#**	**E-Mail:** brandon.hilbrich@hdrinc.com	
Signature:	Victoria J Escobedo	

Additional Information – Subdivision Plat Variances & Time Extensions

1. ☐ Time Extension ☐ Sidewalk ☑ Floodplain Permit ☐ Completeness Appeal
   ☐ Other_____

2. City Council District 6 Ferguson Map Grid_____ Zoning District_____

3. San Antonio City Limits	☑ Yes	☐ No
4. Edwards Aquifer Recharge Zone?	☐ Yes	☑ No
5. Previous/existing landfill?	☐ Yes	☑ No
6. Parkland Greenbelts or open space? Floodplain?	☑ Yes	☐ No

August 29, 2022

Administrative Exception / Variance Request (AEVR) Review
c/o Development Services Staff
Development Services Department
City of San Antonio
1901 S. Alamo
San Antonio, TX 78204

RE: Castleridge/Slick Ranch Creek Mitigation Project (No. 23-01484)
UDC Codes 35-F124(c)(3)

☒Administrative Exception

☐Environmental Variance

☐Subdivision Platting Variance – Time Extension

Dear Development Services Staff,

HDR Engineering, Inc. (HDR) is requesting a floodplain variance for the Castleridge/Slick Ranch Creek Drainage Mitigation Project (Mitigation Project), for increased water surface elevations (WSE) greater than 0.5 feet downstream of the improvement limits. The Mitigation Project in conjunction with the Castleridge/Slick Ranch Creek Drainage Improvements Project (Channel Project) which completed design in October 2019, are part of the City of San Antonio's (CoSA) continued initiative to reduce risk of Slick Ranch Creek (SRC) overbank flooding to adjacent residential neighborhoods downstream of Highway 151 as shown in **Figure 1** and **Exhibit 1** in **Attachment A**. The Mitigation Project extends from Unnamed Tributary 2 to Slick Ranch Creek to the confluence with Leon Creek. The Channel Project is located approximately 1,100 feet upstream of the Mitigation Project.

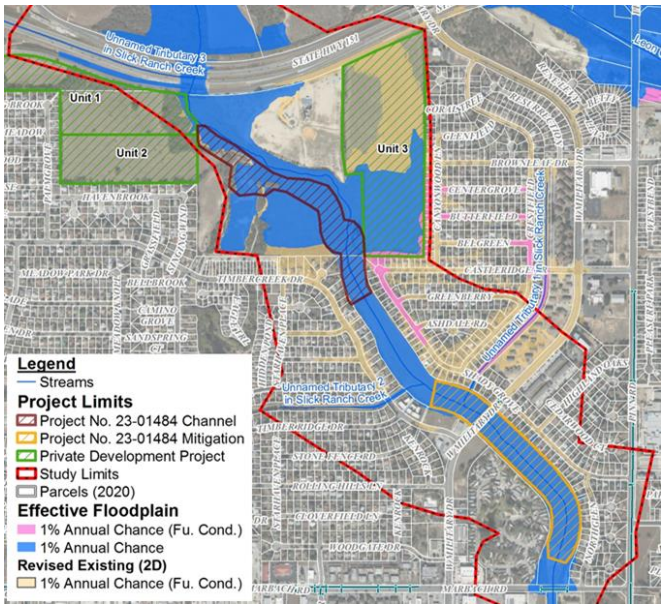


Figure 1: Project Improvements Area

Project Background Information

CHANNEL PROJECT

The Channel Project improvements within Slick Ranch Creek includes constructing an improved earthen bypass channel starting 450 feet upstream of Tom Slick Park parallel to the current channel stream centerline. (**Figure 2**). The new bypass channel will increase channel capacity and eliminate 100-year storm event overflow along the east overbank into the residential area. A new concrete drop structure will be constructed in the park approximately 300 feet upstream of the south property line of the park. This project is currently funded and the project design is complete.

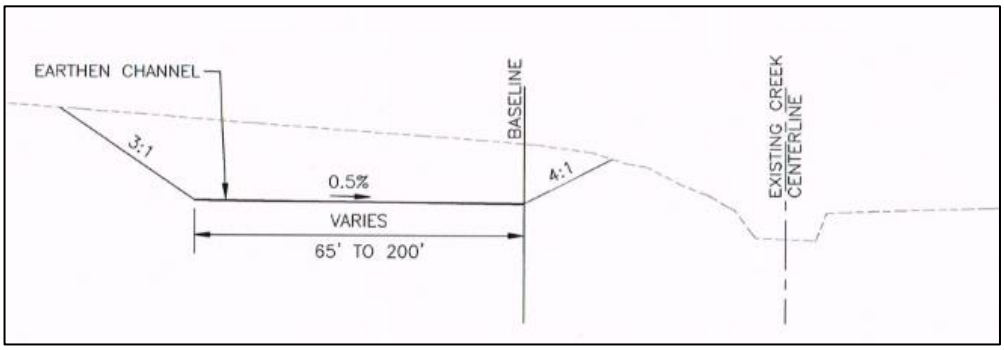


Figure 2 - Proposed Bypass Channel Typical Section

MITIGATION PROJECT

The Mitigation Project improvements within Slick Ranch Creek include lowering the channel flowline from approximately 650 feet upstream of Military Dr. near the Unnamed Tributary 2 confluence to approximately 1,700 linear feet downstream of Military Dr. at the existing drop structure upstream of Marbach Rd. The objective of these improvements is to mitigate the WSE rises caused by the Channel Project improvements upstream of Military Dr. The mitigation channel improvements include a typical 200-ft bottom with 3:1 side slope and a minimum 1.0% cross-slope to an earthen pilot channel (**Figure 3**). Proposed grading is contained within the right-of-way and will begin at the existing side slope toe and excavate down to the desired flowline, thereby increasing the channel capacity within the project limits. This project is currently funded and the project design is complete.

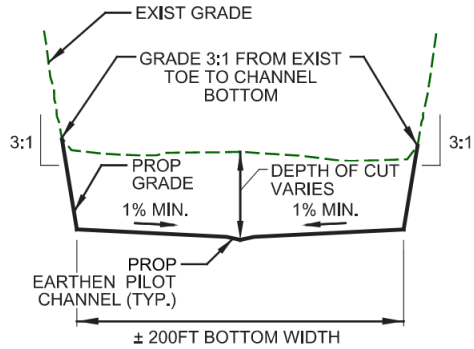


Figure 3 - Proposed Mitigation Channel Typical Section

In conjunction with the two channel projects, a planned residential development is proposing to fill a property within the Slick Ranch Creek east overbank and includes an on-site channel to convey offsite flows from Hwy 151 around the development and discharge into Slick Ranch Creek. The proposed

channel improvements within Slick Ranch Creek will remove flooding in the overbank area and will generate a significant portion of the material for the residential development fill. Details of the Mitigation Project are documented in the Final Design Plans.

Benefit & Impact Analyses

In the preliminary engineering phase of this project, a two-dimensional hydraulic analysis was completed to better understand the existing flood risk conditions for Slick Ranch Creek and the adjacent neighborhoods. Findings from that analysis showed the current effective FEMA floodplain does not accurately communicate the flood risk for approximately 150 homes in the adjacent neighborhoods as shown from the 2D Revised Existing 1% Future Chance inundation exhibits on **Exhibit 1**. This led the development of the proposed Channel Project previously discussed.

In the design phase for the Mitigation Project, hydrologic and Hydraulic analyses were performed using HEC-HMS version 4.8 and HEC-RAS version 6.1 to evaluate proposed flood reduction benefits and flood impacts. Details of these analyses are documented in the Final Design Drainage Report.

The following is a brief summary of the detailed analyses performed, which included three stages of hydraulic model development:

- Duplicate Effective Conditions – The Duplicate Effective hydraulic HEC-RAS model was developed by rerunning the Effective HEC-RAS model to verify effective results were reproduced. The FEMA-approved Effective model produces the mapped Special Flood Hazard Areas (SFHA) depicted on the Flood Insurance Rate Map.
- Corrected Effective Conditions – In addition to incorporating corrected peak flows from a corrected hydrologic HEC-HMS model, the HEC-RAS model was updated to reflect the best present understanding of flood risk. Adjustments were made in the following ways: survey and 2017 LiDAR topographic information was incorporated, cross-section placement, roughness coefficients updated, and lateral structure placement was evaluated and modified. The Corrected Effective Conditions model then becomes the new unofficial baseline model for comparisons.
- Post-Project Conditions – Built on the Corrected Effective HEC-RAS model, the Post-Project model improvements associated with the Channel and Mitigation Projects, and the Private Development Project.

The proposed channel Mitigation Project mitigates WSE rises originally produced by the upstream Channel Project improvements and contains the 100-year design storm within the existing channel banks throughout the project area. The combination of the proposed channel improvement projects will reduce the risk of flooding for local residents and provide sufficient channel conveyance along Slick Ranch Creek to the downstream Leon Creek confluence. However, an impacts assessment downstream of the Mitigation Project confirmed that the downstream Post-Project water surface elevations from Marbach Rd. to the Leon Creek confluence increased between 0.57 ft and 0.84 feet when compared to the Corrected Effective model. This is due to the additional channel conveyance through the project areas that can convey more flow in the downstream direction.

Code Issue

This letter is to request a design variance from **Unified Development Code (UDC) Appendix F (Floodplains – Areas of Special Flood), Section 35-F124(c)(3)** pertaining to permitted water surface elevations (WSE), which states:

> *"An increase in water surface elevation is permitted solely when all the following conditions are met:*
> 1. *Property owner owns both sides of the floodplain.*
> 2. *The increase in the regulatory floodplain is contained in a dedicated drainage easement or right-of-way as required per subsection 35-504(d)(3).*
> 3. *Increase in water surface elevation for the 1% annual chance [AC] floodplain does not exceed six (6) inches.*
> 4. *No increase in water surface elevations or velocities upstream and downstream outside of the owner's property limits."*

When comparing the Post-Project and Corrected Effective model results, the 0.57 to 0.84 foot water surface elevations increases previously mentioned exceed the six (6) increase allowed per the floodplain ordinance.

Justification for Variance Request

WATER SURFACE ELEVATION CONTAINMENT

Following an investigation of these WSE rises when comparing Corrected Effective vs Post-Project (**Table 1**), the following was confirmed:

- All water surface elevation increases are contained within the existing Slick Ranch Creek channel banks from the end of the Mitigation Project to the Leon Creek confluence
- From the end of the Mitigation Project to Pinn Road, the increases are contained within the existing CoSA drainage right-of-way.
- From Pinn Road to the Leon Creek confluence, the increases will be contained in a proposed CoSA drainage right-of-way that is in the process of being acquired (**Exhibit 2** in **Attachment A**). Currently, Slick Ranch Creek is located within private parcels (ID 575193 and 575195) where no drainage right-of-way or easement exists. Final drainage easement documents were provided to the CoSA Real Estate Department. Per correspondence with CoSA Real Estate Department on 8/22/2022, offers have been provided to property owners and are pending acceptance.

FEMA LETTER OF MAP CHANGE - CLOMR

Additionally, a Conditional Letter of Map Revision (CLOMR) has been reviewed and approved by the CoSA Floodplain Administrator and has been approved by FEMA pending community notification. Post-Project floodplain mapping provided in the CLOMR shows an overall reduction in flood hazard limits downstream of the Mitigation Project and will be completely contained within the CoSA dedicated drainage right-of-way. Moreover, the proposed water surface elevation increases only occur when comparing the Post-Project hydraulic model results to the Corrected Effective (existing condition) results. As noted in the CLOMR report and summarized in **Table 1**, the Post-Project 1% AC WSE are significantly less than the current FEMA effective WSE. Following the

completion of construction for the two channel projects, a LOMR will be developed and submitted to FEMA for acceptance of the 1% AC floodplain revisions.

Table 1: Effective vs Post-Project WSE (ft) Results

Cross Section	Location	Effective $WSE_{(1\% AC)}$	Corrected. Eff. $WSE_{(1\% AC)}$	Post-Project $WSE_{(1\% AC)}$	PP – C. Eff $\Delta WSE_{(1\% AC)}$	PP – Eff $\Delta WSE_{(1\% AC)}$
2731	End of Mitigation Project	720.76	716.09	716.85	0.76	-3.91
2657		720.75	716.14	716.89	0.75	-3.86
2594		720.63	715.98	716.73	0.75	-3.90
2540		720.43	715.62	716.37	0.75	-4.06
2490		719.77	714.73	715.46	0.73	-4.31
2438	Marbach Rd.	-	-	-	-	-
2385		718.84	712.87	713.71	0.84	-5.13
2243		718.62	712.74	713.56	0.82	-5.06
2095		718.52	712.72	713.52	0.80	-5.00
1935		718.60	712.81	713.58	0.77	-5.02
1671		718.54	712.30	713.01	0.71	-5.53
1436		718.45	711.74	712.33	0.59	-6.12
1313		718.43	711.95	712.54	0.59	-5.89
1249	Pinn Rd.	-	-	-	-	-
1184		713.00	704.63	705.29	0.66	-7.71
1021		711.75	704.75	705.41	0.66	-6.34
799		709.38	703.13	703.71	0.58	-5.67
550		708.32	700.97	701.53	0.56	-6.79
302	Leon Creek Confluence	705.97	699.40	699.97	0.57	-6.00

Refer to **Exhibit 2** in **Attachment A** for cross-section location and floodplain extents.

Conclusion

The Mitigation Project improvements were designed to increase channel conveyance along Slick Ranch Creek to reduce the adverse impacts caused by the Channel Project improvements upstream within Tom Slick Park and not cause further adverse impacts to private property or structures. The Mitigation Project allows the Channel Project to meet the no adverse impact criteria, providing flood relief for nearly 150 residents who have experienced flooding from Slick Ranch Creek. Although the combination of the two channel projects exhibit WSE rises downstream from Marbach Rd. to the Leon Creek confluence, those stated rises are contained within the existing Slick Ranch Creek channel banks and current or future drainage right-of-way. Additionally, the Marbach and Pinn bridge crossings are not adversely impacted by the Mitigation and Channel Projects and remain safe. Due to these reasons, we believe that the public, health, safety, and welfare will be preserved if this Variance is granted.

Based on these considerations, acceptance of the proposed Variance Request will allow the Channel Project to be constructed, removing nearly 150 residential structures from flood risk. Additionally, the Variance will allow the Mitigation Project to be constructed and mitigate subsequent adverse impacts to private properties and structures. The public interest underlying the proposed exception outweighs the public interest underlying the particular regulation for which the Variance is granted.

The alternative, should the request not be approved, would be to design additional channel conveyance improvements from Marbach Rd. to the Leon Creek confluence to offset the water surface elevation increases that are currently within the existing channel banks. Awaiting the design

of those additional downstream project would further delay the construction of the Channel Project which is currently funded and has the primary objective of providing immediate flood risk reduction for local residents. Furthermore, securing the millions of dollars necessary to construct the additional channel conveyance project will likely take years to achieve.

Based on the above considerations, the public interest underlying the proposed exception outweighs the public interest underlying the particular regulation for which the Variance is granted. In HDR's professional opinion, the proposed Variance Request remains in harmony with the spirit and intent of the UDC as it will not adversely affect the health, safety, or welfare of the public.

Sincerely,
HDR Engineering, Inc.

Brandon Hilbrich, PE, CFM (PE# 112938)
Water Resources Project Manager

cc:

Attachment(s)
1. Project Exhibits

For Office Use Only: AEVR #: Date Received: _____

DSD – Director Official Action:

☐APPROVED ☐APPROVED W/ COMMENTS ☐DENIED

Signature: _____ Date: _____

Printed Name: _____ Title: _____

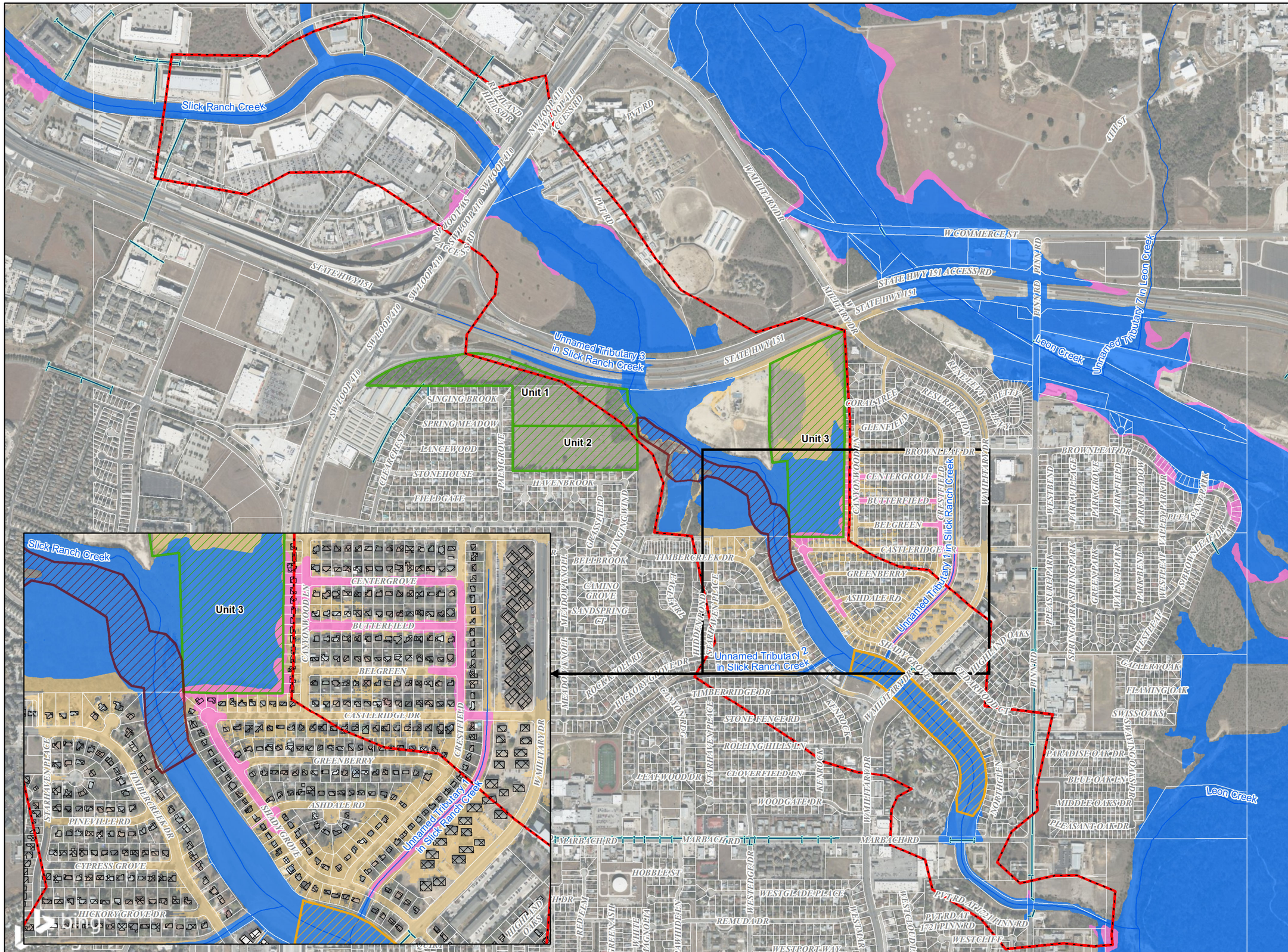
Comments: _____

_____

Attachment A: Exhibits

Exhibit 1: Project Location Map

Exhibit 2: Floodplain Comparison Map



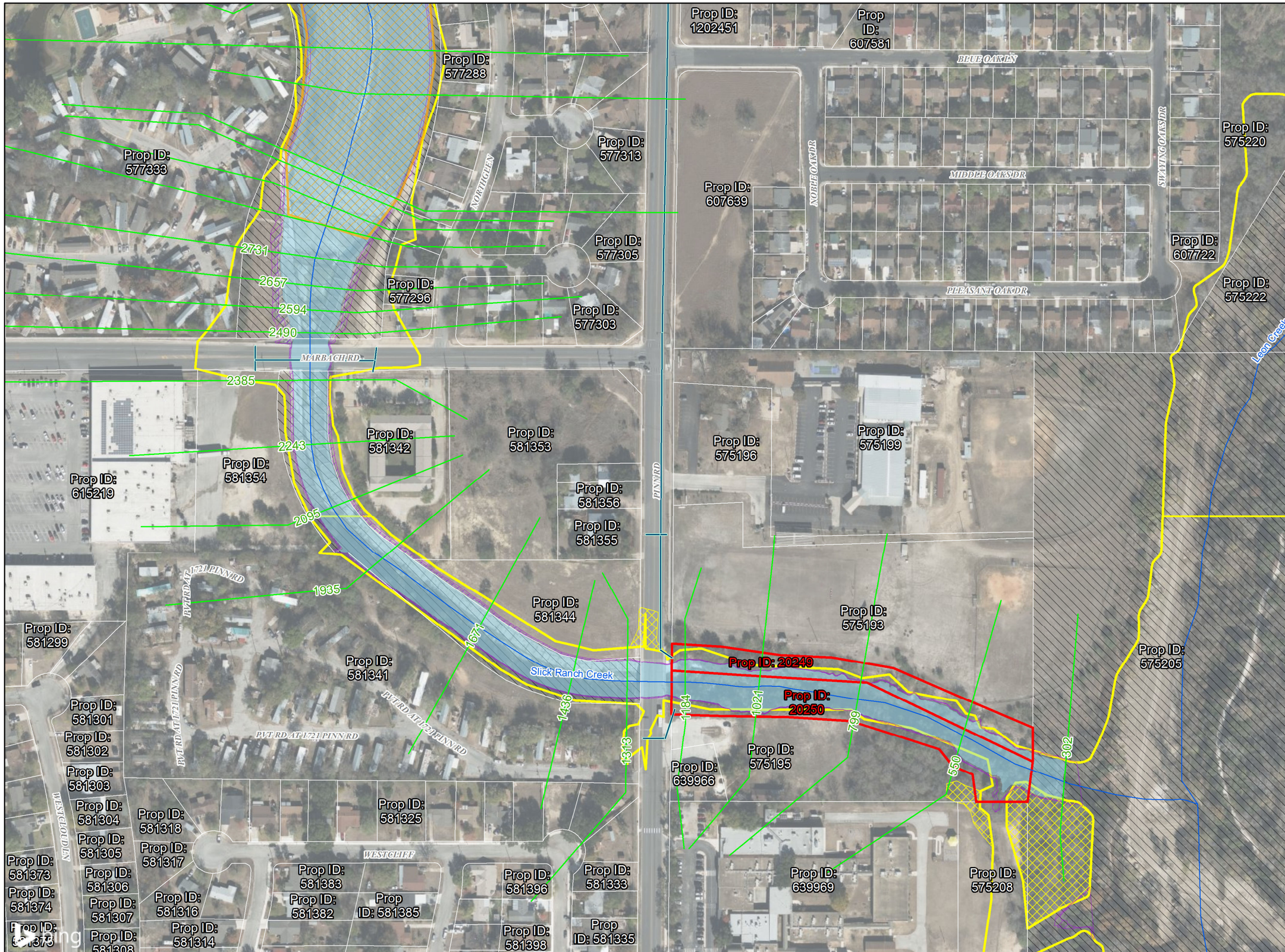
CASTLERIDGE/SLICK RANCH CREEK MITIGATION IMPROVEMENTS

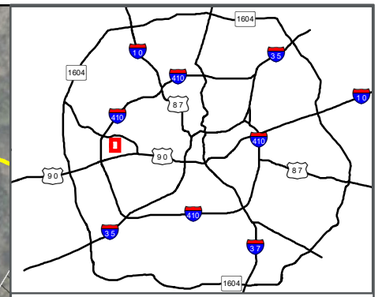
Variance Request

Project Location Map

AUG. 2022	EXHIBIT 1

PATH: P:\3732_CITYOFSANANTONIO\10323903_SLICKRANCHCREEK_DESIGN\07_GIS_MODELS\MAP_DOCS\DRAFT\EXHIBITS\VARIANCE_LETTER_EX1_PROJECTLOCATION.MXD - USER: DCOBURN - DATE: 8/29/2022





Legend

- RAS Cross Sections
- Streams
- Storm Drains
- Project No. 23-01484 Mitigation
- Study Limits
- Parcels (2020)
- City Owned Parcels
- ROW Acquisition

Effective Floodplain

- 1% Annual Chance
- 1% Annual Chance (Fu. Cond.)

Project Floodplain

Post-Project Conditions

- 1% Annual Chance
- 1% Annual Chance (Fu. Cond.)

Corrected Effective Conditions

- 1% Annual Chance
- 1% Annual Chance (Fu. Cond.)

DATA: CoSA, BCAD, FEMA, SARA, & TNRIS

DISCLAIMER: Data was compiled from the best available sources. No warranty is made for the accuracy or completeness.

Vertical Datum: NAVD88
Horizontal Datum: NAD83

N

0 200 400
Feet

CITY OF SAN ANTONIO PUBLIC WORKS DEPARTMENT

HDR

CASTLERIDGE/SLICK RANCH CREEK MITIGATION IMPROVEMENTS

Variance Request

Floodplain Comparison Map

AUG. 2022	EXHIBIT 2

PATH: P:\3732_CITYOFSANANTONIO\10323903_SLICKRANCHCREEK_DESIGN\07_GIS_MODELS\MAP_DOCS\DRAFT\EXHIBITS\VARIANCE_LETTER_EX2_FLOODPLAINCOMPARISON.MXD - USER: DCOBURN - DATE: 9/26/2022