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MEMORANDUM

DATE: August 26, 2020
TO: Andrew Canon, Executive Director, RGVMPPO
CC: Luis Diaz
FROM: JD Allen, AICP, WSO-CSSD, TSSP-RAIL/BUS
RE: RGVMPPO 2045 MTP Existing Environmental Conditions Memorandum

Introduction

Part of every Metropolitan Transportation Planning (MTP) process includes reviewing the designated area, in this case the Rio Grande Valley Metropolitan Area Boundary (RGVMAB), for environmental, cultural, and civic assets that may be impacted by future transportation projects. Taking an inventory of these assets helps to contribute to the system level analysis of infrastructure investment scenarios and proposed future transportation projects. The analysis in this memorandum will identify both potential environmental constraints in addition to opportunities to increase connectivity and accessibility to valuable community resources within the RGVMAB. This memo also discusses potential performance measures that may be considered when conducting the system-level environmental mitigation analysis and project prioritization process.

Environmental Features and Hazards

Water Features

There is one major aquifer, the Gulf Coast aquifer, which encompasses the west half of the RGVMAB and extends to Brownsville. This aquifer provides water used for municipal, industrial, and irrigation purposes throughout the RGVMAB. The major water feature in the RGVMAB is the Rio Grande River, which forms the region's southern border with Mexico. The RGVMAB contains a total of 4,985 miles of rivers and streams. Additionally, the RGVMAB contains the Rio Grande and Nueces-Rio Grande River Basins.

Special Flood Hazard Areas

Special Flood Hazard Areas (SFHA) are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. The SFHA is the area where the National Flood Insurance Program's (NFIP's) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The SFHA includes Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V.¹

¹ <https://www.fema.gov/special-flood-hazard-area>

Table 1 presents an inventory of the different SFHAs in the RGVMA, which are categorized in the following categories² and displayed in **Figure 1**:

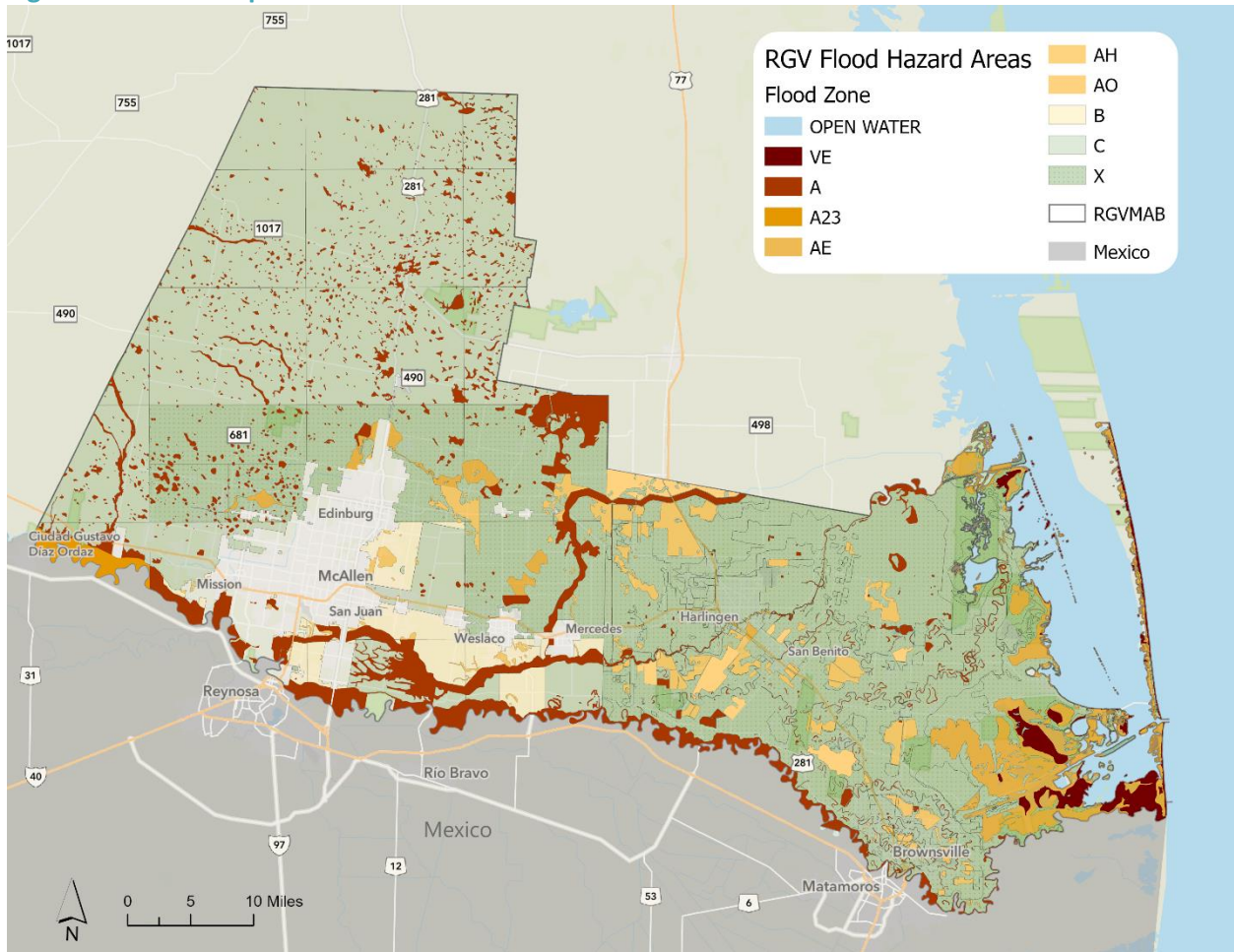
- Moderate to Low Risk Areas
 - B (3.4%): Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood. An area inundated by 0.2% annual chance flooding.
 - C (33.9%): Area of minimal flood hazard, usually depicted on flood insurance rate maps (FIRMs) as above the 500-year flood level. Zone C may have ponding and local drainage problems that do not warrant a detailed study or designation as base floodplain.
 - X (43%): Areas determined to be outside 500-year floodplain determined to be outside the 1% and 0.2% annual chance floodplains. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.
- High Risk Areas
 - A (9%): An area inundated by 1% annual chance flooding, for which no Base Flood Elevation (BFE) has been determined.
 - A23 (0.5%): An area inundated by 1% annual chance flooding, for which BFEs have been determined.
 - AE (4.6%): An area inundated by 1% annual chance flooding, for which BFEs have been determined.
 - AH (3.3%): An area inundated by 1% annual chance flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet.
 - AO (1.1%): An area inundated by 1% annual chance flooding (usually sheet flow on sloping terrain), for which average depths have been determined; flood depths range from 1 to 3 feet.
- High Risk – Coastal Areas
 - VE (1.2%): Coastal areas inundated by 1% annual chance flooding with velocity hazard (wave action); BFEs have been determined.

² <http://www.floodmaps.com/zones.htm>

Table 1: RGVMP Special Flood Hazard Areas Inventory

Special Flood Hazard Area Type	Number of Areas	Total Sq. Miles	% of Total Area
A	545	211.2	9.0%
A23	1	11.4	0.5%
AE	280	106.6	4.6%
AH	168	76.3	3.3%
AO	11	26.5	1.1%
B	7	79.7	3.4%
C	21	794.6	33.9%
VE	65	29.1	1.2%
X	640	1005.6	43.0%

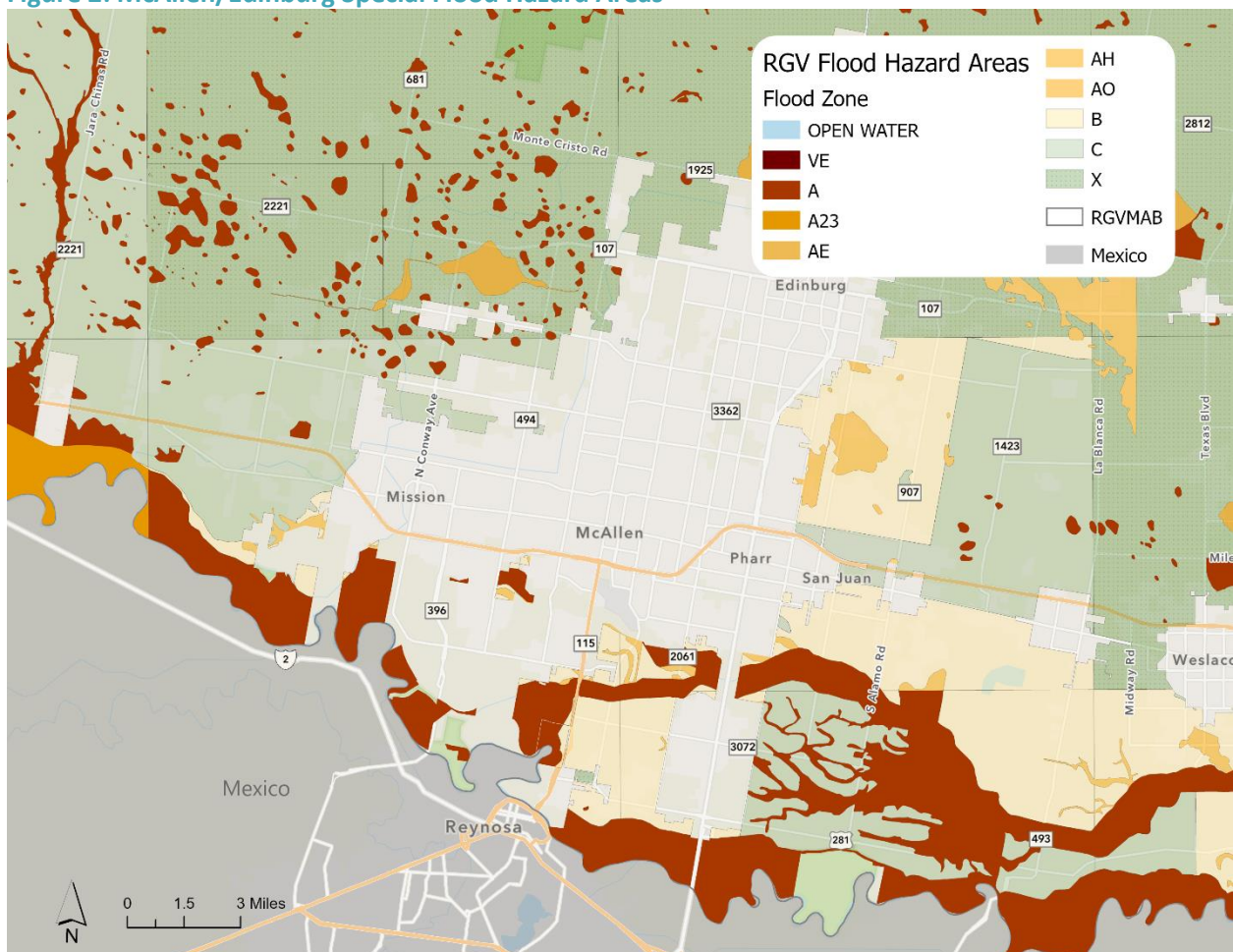
Figure 1: RGVMAB Special Flood Hazard Areas



The flood zones in the McAllen/Edinburgh urbanized areas include (see **Figure 2**):

- Most of the McAllen/Edinburgh urbanized area did not have complete digitized floodplain data available. The current published effective FIRMs are available for review online and show that the majority of the McAllen urbanized area is C and B.³ If warranted, these FIRMs will be reviewed in greater detail as proposed projects are analyzed for potential system level impacts during the MTP update process.
- A substantial portion of the area to the southeast of Edinburg is in either a 500-year or 100-year flood plain. As noted in the Equity Analysis Memo this area is of environmental justice concern as well. This area is within the floodplain of the Arroyo Colorado River and the Rio Grande River.

Figure 2: McAllen/Edinburg Special Flood Hazard Areas



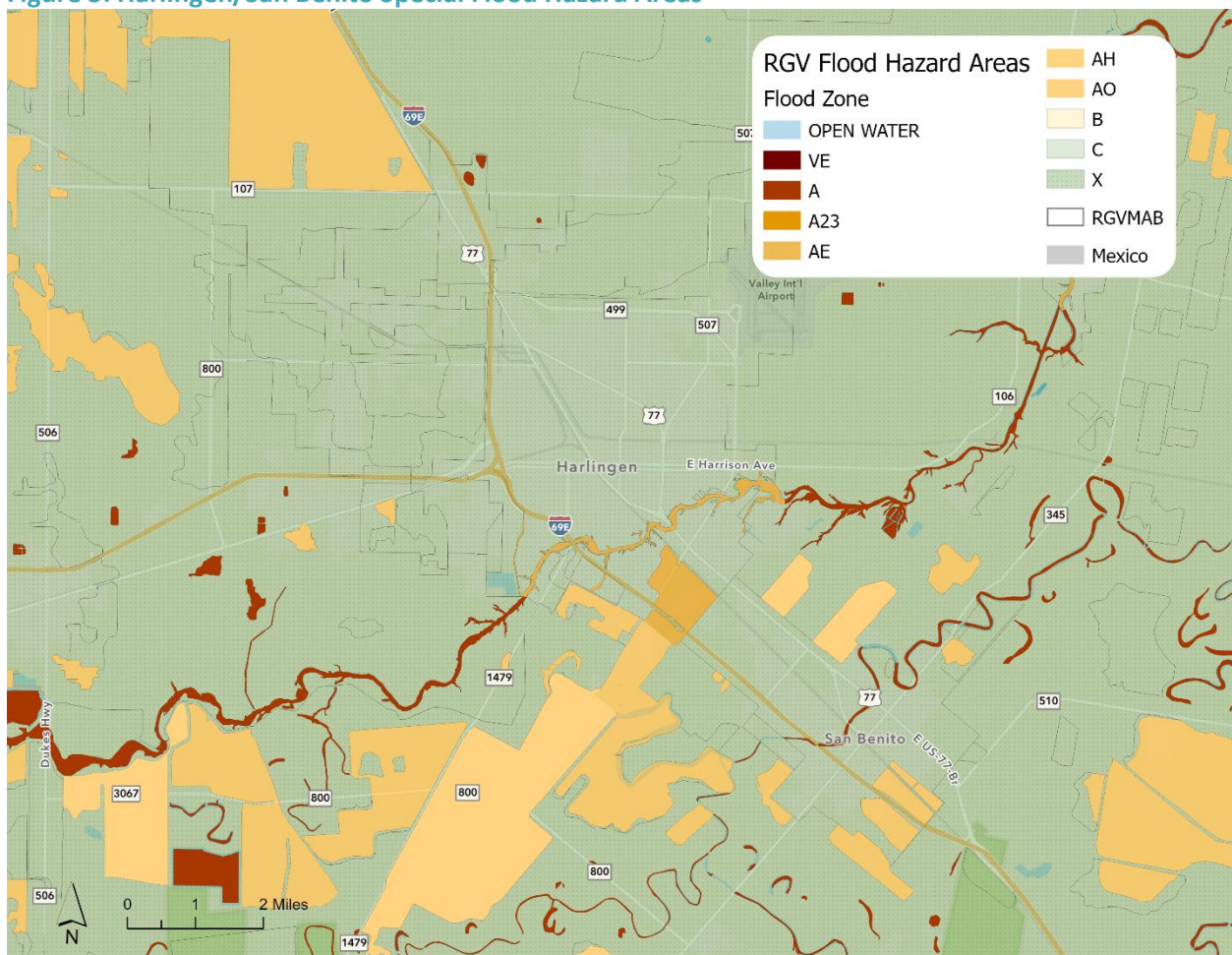
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<https://msc.fema.gov/portal/availabilitySearch?addcommunity=480343&communityName=MCALLEN,%20CITY%20OF#searchresultsanchor>

The flood zones in the Harlingen/San Benito urbanized area include (see **Figure 3**):

- Most of the Harlingen/San Benito urbanized area falls within the X designation which is a low risk flood zone.
- The southern and eastern edges of the Harlingen/San Benito urbanized area lie within the floodplain of the Arroyo Colorado River.
- There are areas of higher flood risk between I-69E and FM 800.
- There are areas of higher risk flood plain near the intersection of FM 3067 and FM 506.

Figure 3: Harlingen/San Benito Special Flood Hazard Areas



Brownsville is the highest risk urbanized area in the RGVMP regarding general flooding events. The flood zones in the Brownsville urbanized area presented in **Figure 4** include:

- The southern and eastern edges of the Brownsville urbanized area lie within the floodplain of the Resaca de la Palma, the Rancho Viejo River and Rio Grande River.
- The Laguna Atascosa National Wildlife Refuge and the Las Palomas Wildlife Management Area: Boca Chica Unit are both coastal public land areas that see higher levels of flooding (see **Figure 5**).

Figure 4: Brownsville Special Flood Hazard Areas

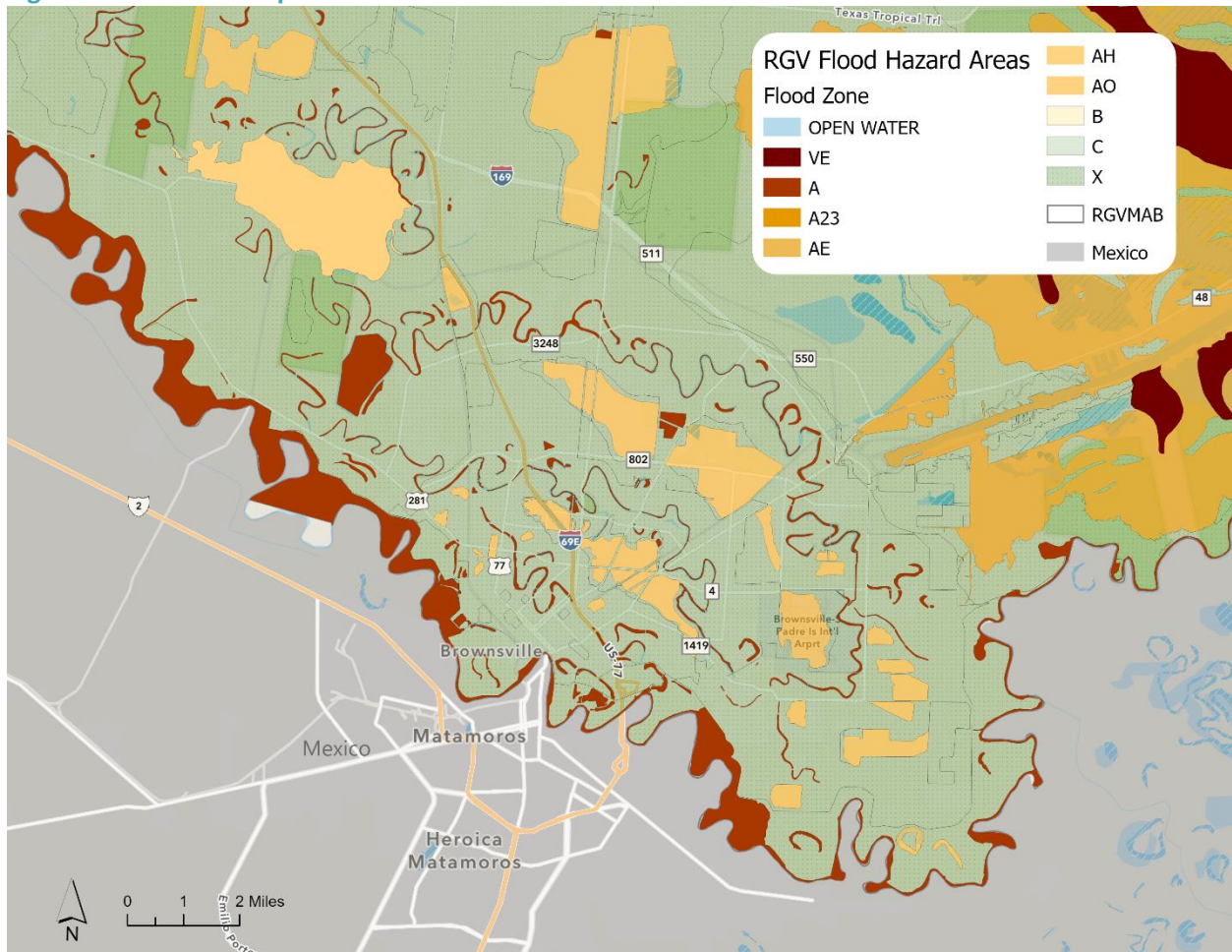
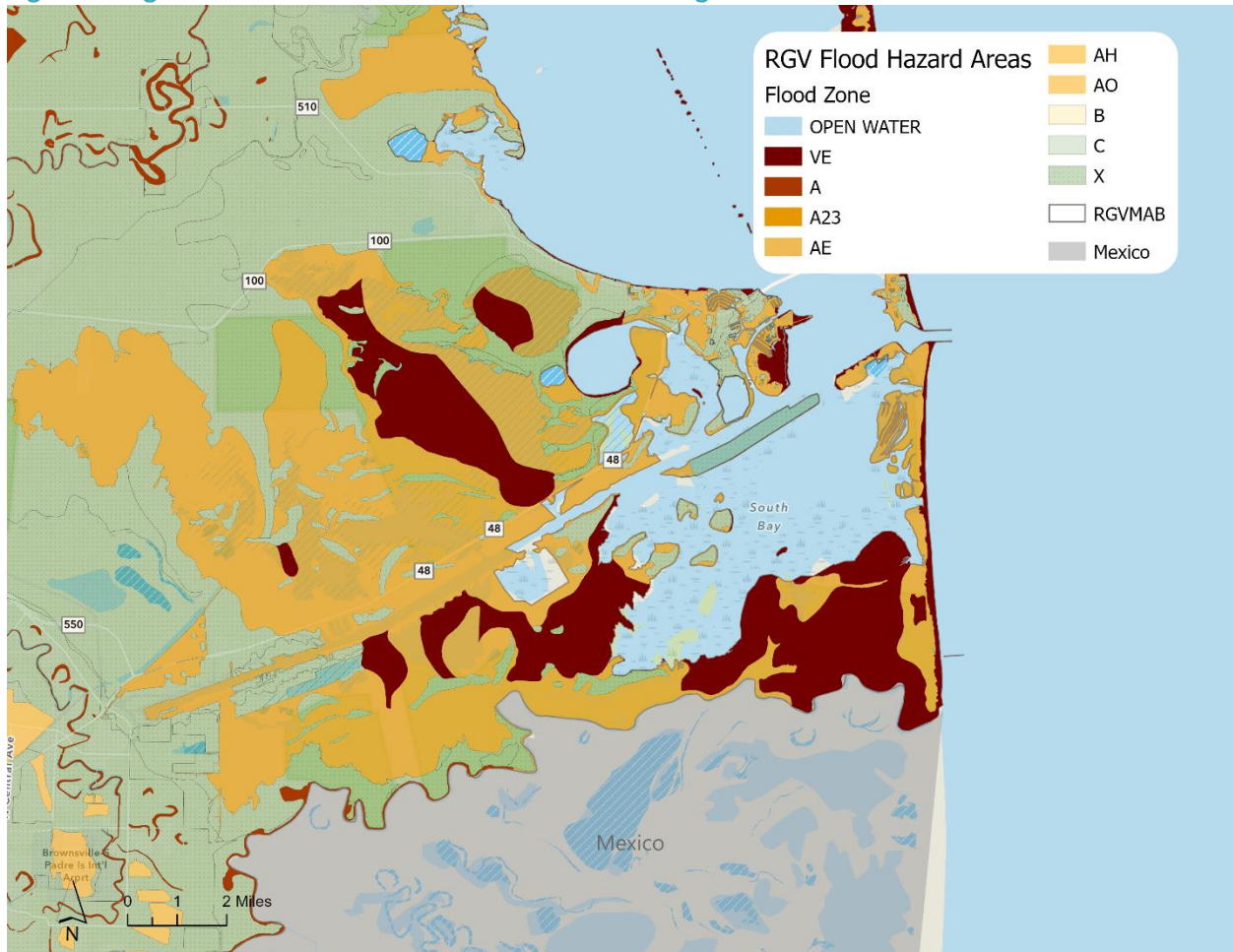


Figure 5: Laguna Atascosa and Las Palomas Wildlife Management Area Flood Zone



Wetlands and Water Features

Wetlands exist throughout the RGVMAB (Figure 6), but the largest are located on the east side of the region, between Brownsville and Port Isabel, such as the Laguna Atascosa and the Bahía Grande. Additionally, throughout the rest of the RGVMAB wetlands exist as small strips lining the resacas and the irrigation canals in the Water Control & Improvement Districts. These swaths of wetland are classified as riverine wetlands, which are found in floodplains and other water channels.⁴

There are 55 surface water intake facilities in the RGVMAB; surface water intakes allow water to be taken from the surface following fluctuations of the water level, which helps to prevent over withdrawal and contamination.⁵ These facilities collect surface water from the Rio Grande River, which is the primary source of drinking water for the RGVMAB.

⁴ US Environmental Protection Agency, "Methods for Evaluating Wetland Condition: #7 Wetlands Classification" (Washington, DC: Office of Water, 2002) https://www.epa.gov/sites/production/files/documents/wetlands_7classification.pdf

⁵ https://www.researchgate.net/profile/Arvind_Singh56/post/Could_anyone_be_able_to_share_the_detailed_design_Environmental_as_well_a

Figure 6: RGVMAB Water Features

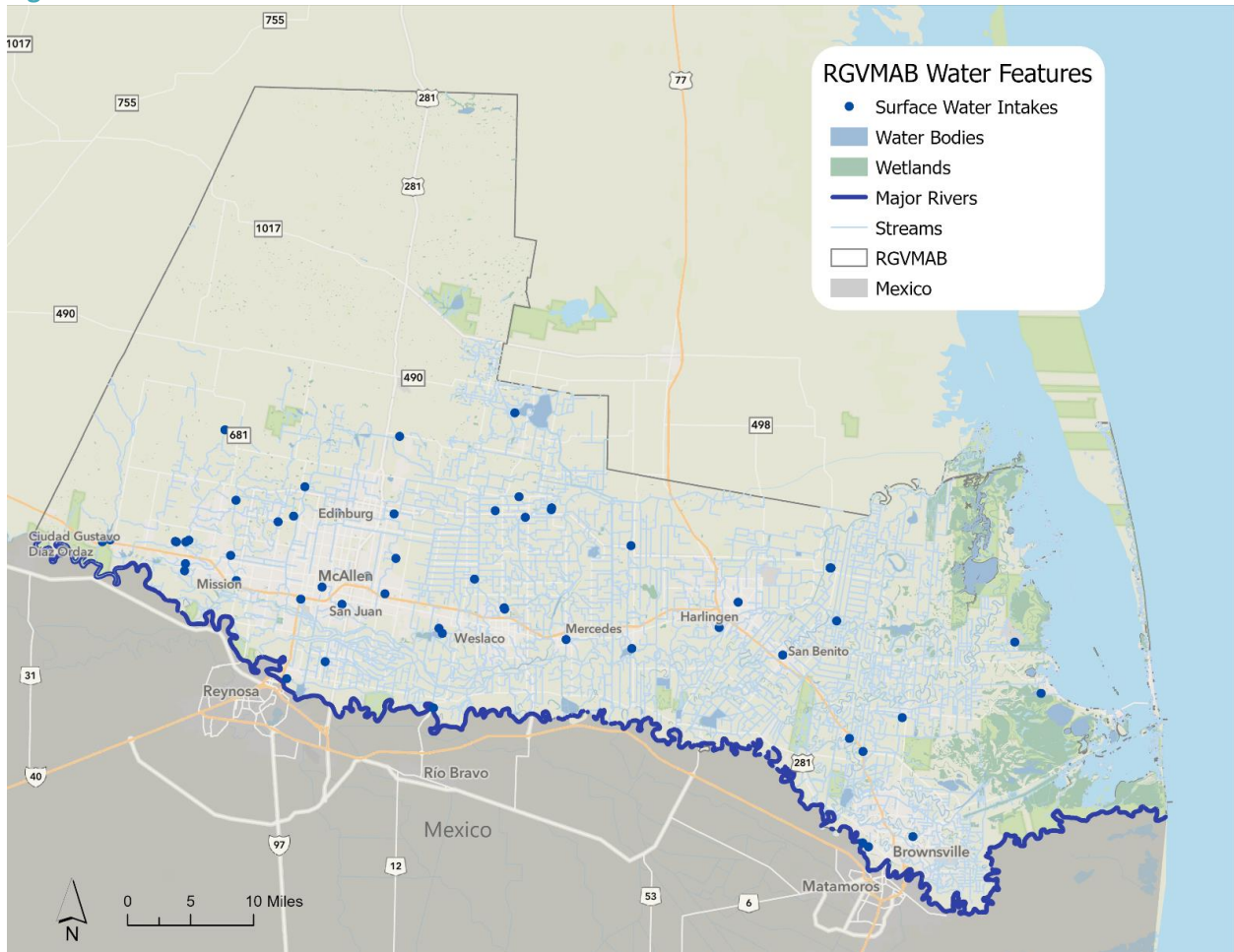


Table 2: RGVMAB Environmental Features

Environmental Features	Amount
Rivers and Streams	4,985 miles
Wetlands	160 square miles
Surface Water Intake Sites	55 sites

Environmental Hazards

Environmental hazards in the region include superfund, solid waste, brownfield, and industrial and hazardous waste sites (Figure 7). A total of 202 hazard sites are spread throughout the region, the majority being solid waste and industrial/hazardous waste sites. Of the superfund sites, three of the four have been remedied and require no further environmental response actions. The Donna Reservoir and Canal System is the only superfund site that still requires remediation, which was proposed for March 2020. Additionally, nine of the twelve brownfield sites are in Hidalgo County.

Figure 7: RGVMP Environmental Hazards

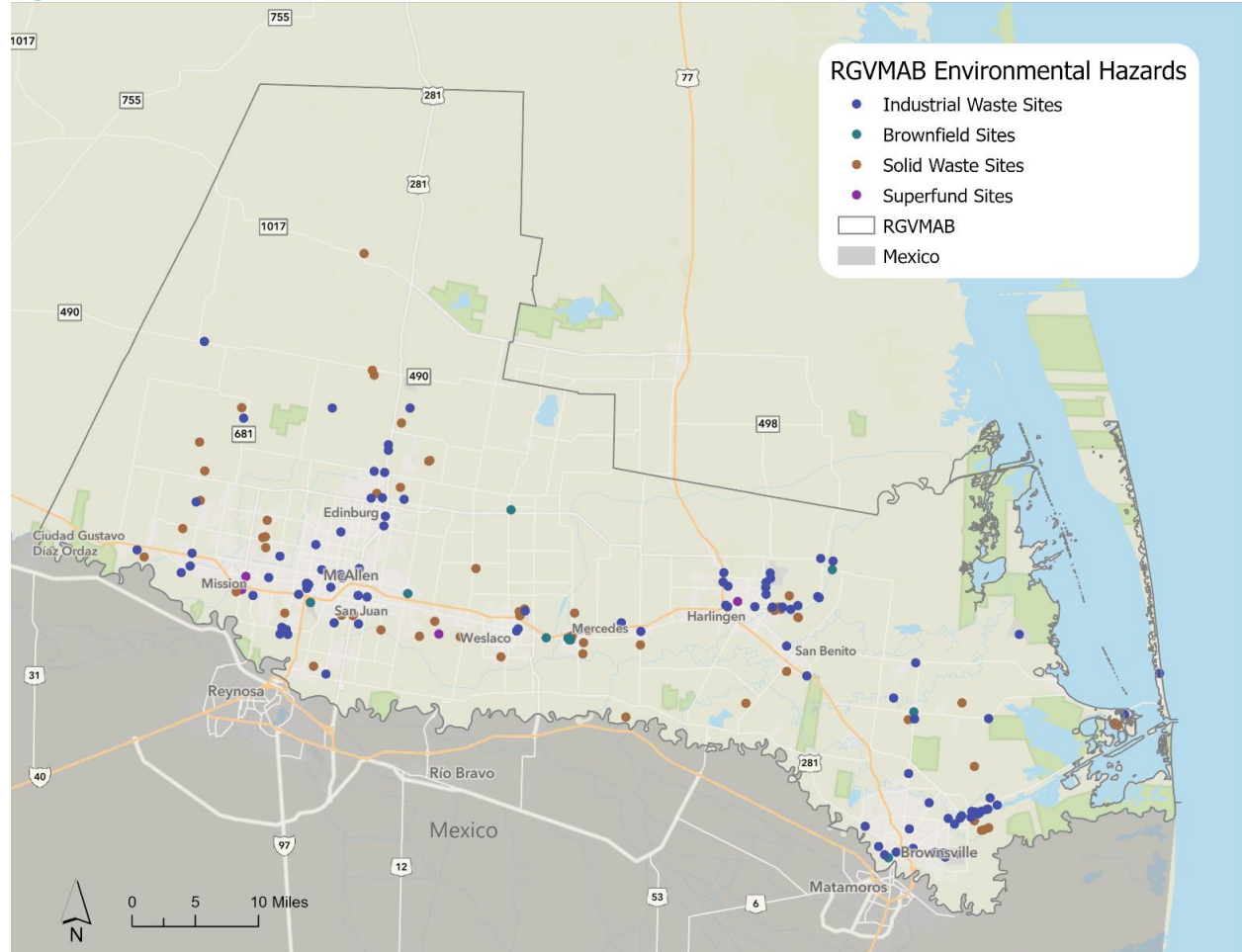


Table 3: RGVMP Environmental Hazards

Environmental Hazards	Amount
Superfund Sites	4 sites/facilities
Solid Waste Sites	74 sites/facilities
Brownfield Sites	12 sites/facilities
Industrial/Hazardous Waste Sites	112 sites/facilities

Existing Cultural & Community Assets

Additional analysis performed for this memo identified cultural and community assets in the RGVMP. The purpose of this analysis is twofold, a) to understand whether the region’s communities have adequate access to such amenities; and b) identify the geographic location of assets for use in the environmental mitigation process to determine if proposed projects pose any potential harm to the assets. This analysis informs project prioritization as improving access to these assets may have a positive impact on a proposed transportation project’s score. In contrast, if a transportation project negatively impacts an asset it may negatively impact the project’s score.

Cultural and community assets identified in the RGVMP included 192 square miles of parks and public lands, and a total of 394 cultural assets such as museums, historical districts, historical markers, and cemeteries (including historical cemeteries) (**Figure 8**). The identified cultural and community assets are distributed throughout the region, with clusters along the Rio Grande River. Parks and public land are concentrated along the Rio Grande River and the eastern border of the RGVMP, where the Laguna Atascosa National Wildlife Refuge is located.

Figure 8: Cultural & Community Assets

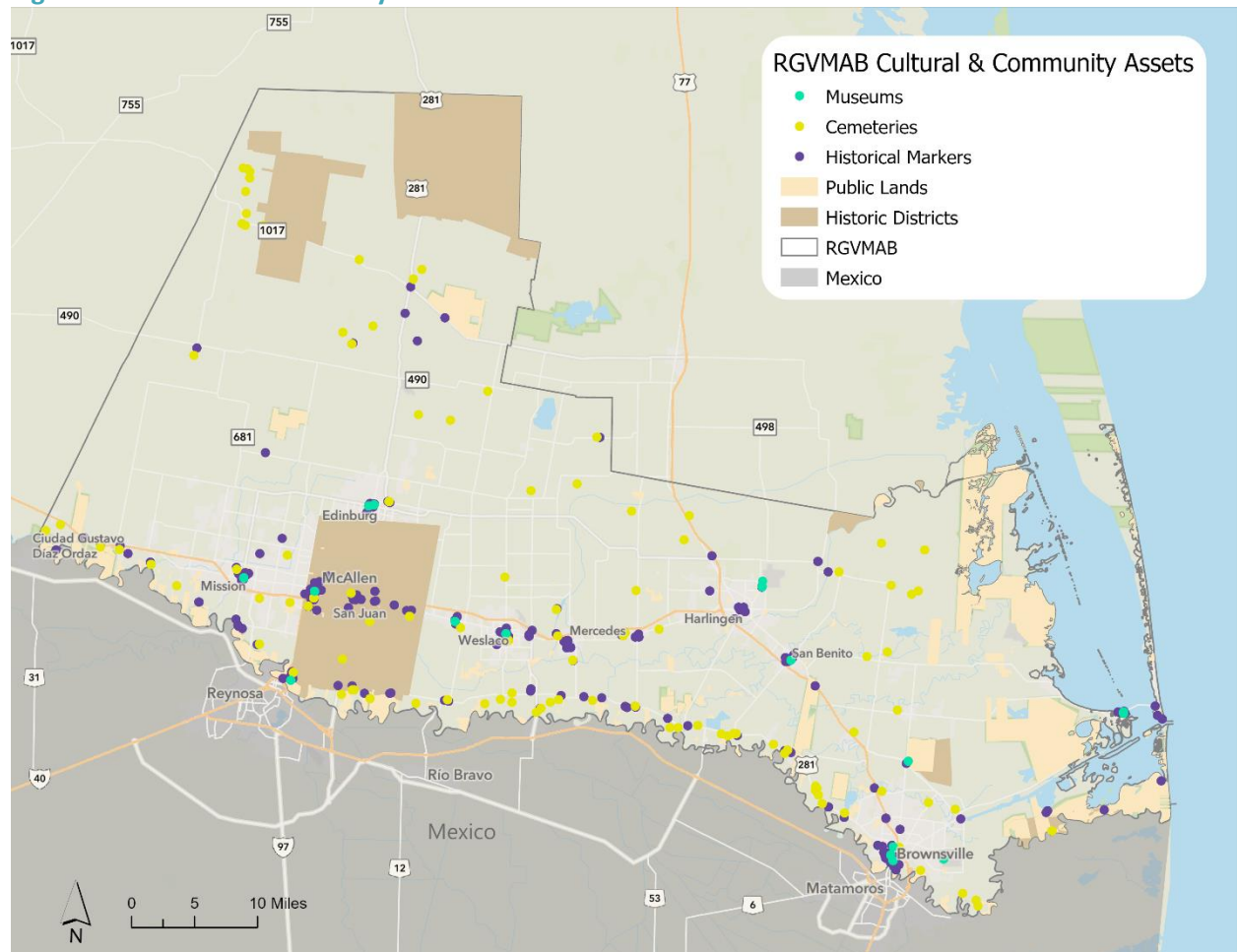


Table 4: Cultural & Community Assets

Cultural/Community Assets	Amount
Parks/Public Lands	192 square miles
Wildlife Management Areas	17 areas
Historic Districts	25
Historical Markers	265
Cemeteries	109

Air Quality Conformity

Transportation air quality conformity is required by the Clean Air Act section 176(c) (42 U.S.C. 7506(c)) to ensure that federal funding and approval are given to highway and transit projects that are consistent with ("conform to") the air quality goals established by a state air quality implementation plan (SIP). Conformity means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the National Ambient Air Quality Standards (NAAQS).

These standards are based on criteria pollutants, which include Ground-level Ozone, Particulate Matter (PM), Carbon Monoxide (CO), Lead, Sulfur Dioxide (SO₂), and Nitrogen Dioxide (NO₂). Areas that do not meet these standards are considered nonattainment areas, while areas that had not previously met these standards but are progressing are considered maintenance areas. MPOs in non-attainment and maintenance areas must conduct a formal Air Quality Conformity Analysis each time they update or amend their MTP or TIP to demonstrate that the estimated emissions do not exceed the emissions limit established in the state's air quality state implementation plan (SIP). The emissions limit is referred to as the motor vehicle emissions budget (MVEB).⁶

Fortunately, the RGVMA is currently an attainment area and is not required to conduct a formal Air Quality Conformity Analysis. However, as a part of MTP environmental mitigation, all MPOs are required to consider how their MTP may impact the region's mobile source emissions and the achievement of the transportation related NAAQS. The existing standards for each of the six criteria pollutants are listed in **Table 5**. The units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m³). The existing standard for Ozone was established by a 2008 Final Rule. In November 2014, the Environmental Protection Agency (EPA) proposed to revise the primary and secondary standards to somewhere within the range of 0.065 and 0.070 ppm. After the proposed rule was published in December 2014, the EPA accepted written comments on the proposed rule until March 17, 2015. The EPA issued its final rule strengthening the ozone standards to 0.070 ppm on October 1, 2015. The EPA has delayed issuing guidance on conformity requirements for transportation planning in relation to the 2015 Ozone rule. Until then, these MTPs are only required to maintain compliance with the 2008 standard definition.

⁶ <https://www.tceq.texas.gov/airquality/mobilesource/apr2003transconf.html>

Table 5: Existing Standards for Criteria Pollutants

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	Primary	8-Hour	9 ppm	Not to be exceeded more than once per year	
		1-Hour	35 ppm		
Lead	Primary and Secondary	Rolling 3- month average	0.15 µg/m ³	Not to be exceeded	
Nitrogen Dioxide (NO ₂)	Primary	1-hour	100 ppb	98th percentile, averaged over 3 years	
	Primary and Secondary	Annual	53 ppb	Annual mean	
Ozone	Primary and Secondary	8-hour	0.075 ppm	Annual fourth-highest maximum daily 8-hour concentration, averaged over 3 years	
Particle Matter (PM)	PM2.5	Primary	Annual	12 µg/m ³	Annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m ³	Annual mean, averaged over 3 years
	PM10	Primary and Secondary	24-hour	35 µg/m ³	98th percentile, averaged over 3 years
		Primary and Secondary	24-hour	150 µg/m ³	Not to be exceeded more than once per year,
Sulfur Dioxide (SO ₂)	Primary	1-hour	75 ppb	9th percentile of daily 1-hour maximum, averaged over 3 years	
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year	

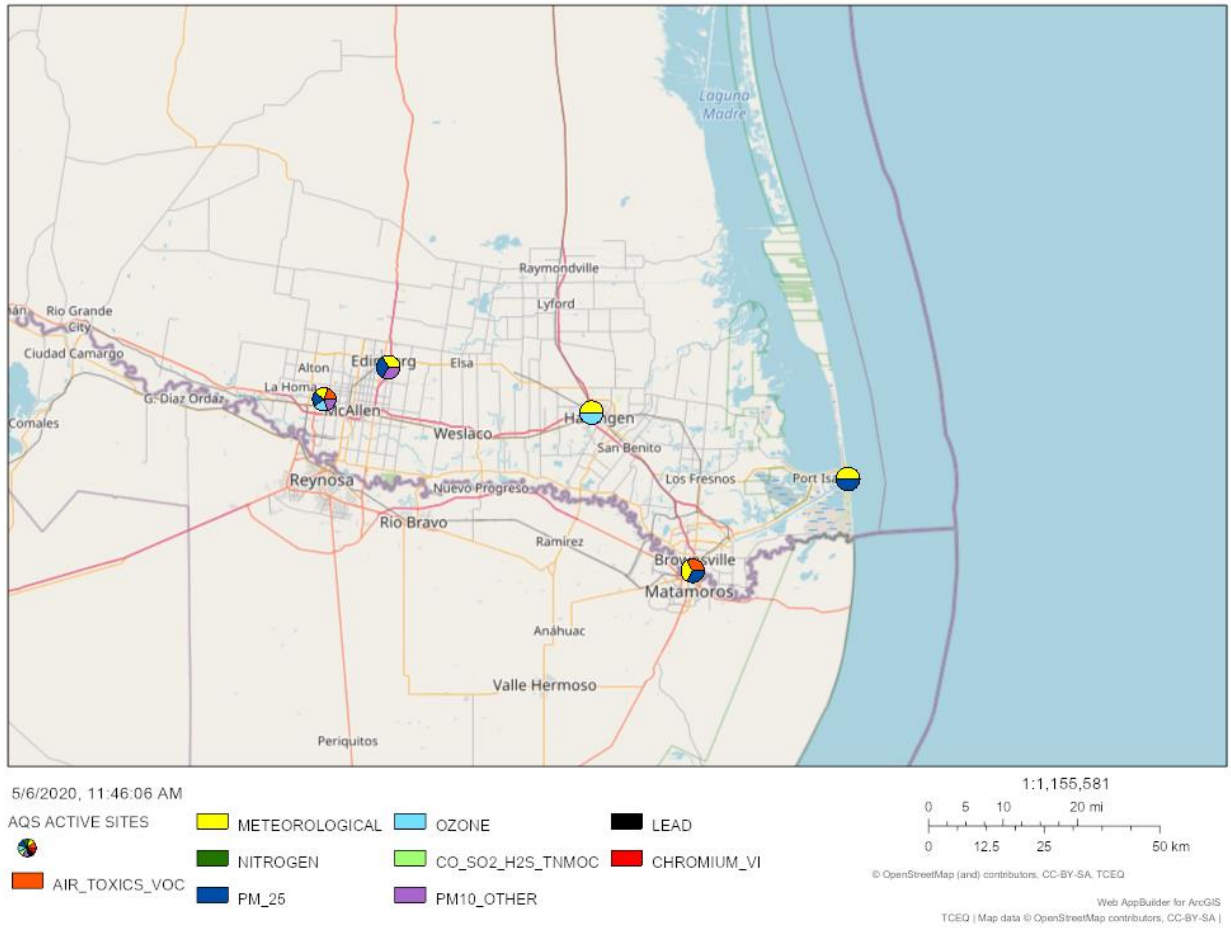
According to the Environmental Protection Agency (EPA) (as of April 30, 2020), neither Cameron nor Hidalgo County fall within nonattainment status for any criteria pollutants. Within the RGVMAB, there are five air quality monitoring sites (see **Figure 9**) that monitor a variety of different air pollutants, see **Table 6**.

Table 6: RGVMAB Air Quality Monitoring Sites

Air Quality Monitoring Site	Pollutants Monitored
Mission	Canister (Single), O ₃ , PM10 (FRM), PM2.5 (Beta), Solar Radiation, Temperature, and Wind
Edinburg East Freddy Gonzalez Drive	PM10 (FRM), PM2.5 (FRM), Temperature, and Wind
Harlingen Teege	O ₃ , Temperature, and Wind
Brownsville	Canister (Single), PM2.5 (Beta), Solar Radiation, Temperature, and Wind
Isla Blanca State Park Road	PM2.5 (Beta), Temperature, and Wind

The metropolitan planning process encourages periodical review of air quality conformity. Even when an area is in attainment, best practice is to conduct early action planning to help ensure the health of the regional community and help avoid a potential slip into non-attainment status. By including air quality review of the MTP during the environmental mitigation process, RGVMPO can achieve both of these goals by ensuring that the MTP supports compliance with the SIP and that the MTP is continuing to meet the needs of the region over time.

Figure 9: RGVMAB Air Quality Monitoring Sites



Sensitive Sites

Part of the National Environmental Policy Act (NEPA) process is to evaluate projects for any potential impacts on sensitive environmental sites such as bald eagle nests or important cultural resources such as archaeological sites. Although detailed NEPA review is not part of the MTP environmental mitigation process, a fatal flaw review of known sensitive environmental sites and cultural resources is advisable.

Although location data on these sites is not openly available, the State of Texas in partnership with EPA make limited-use GIS data (protected by non-disclosure agreements) available for purposes of mitigating environmental impacts on sensitive sites. Once the program of candidate projects is developed, provisions will be made for conducting a review of known environmental sites and cultural resources to ensure that the MTP is not negatively impacting these important features.

Threatened and Endangered Species

It is also necessary to consider Federal and State threatened and endangered species during the transportation planning process. This includes the application of various state laws enforced by the Texas Parks and Wildlife Department (TPWD), as well as Federal authority under the U.S. Endangered Species Act. Adherence to such legislation further ensures compliance with Council of Environmental Quality (CEQ) regulations that address the NEPA transportation decision-making framework – namely, the assessment of environmental impacts produced by proposed transportation projects.⁷ The habitats and locations of protected and endangered species is not published as part of this analysis, but would be reviewed on a case by case basis as part of the NEPA decision-making framework mentioned above.

Conclusion

A large portion of the RGVMPAB is covered by environmental features and cultural and community assets. This includes features such as wildlife management areas, wetlands, waterbodies, historic districts, and parks that could present challenges when addressing transportation issues in the region. These types of features are sensitive, and there can be strict development restrictions or requirements attached to them, particularly flood zones and wetlands. These features also represent valuable areas that would benefit from improved connectivity on a regional scale.

Environmental hazards and cultural assets in the region tend to cluster in the urban areas. Many are along major roadways, meaning that proposed transportation could be impacted during the project prioritization process due to their proximity to these environmental and cultural points.

Performance measures indicate that the region has taken the proper precautions to maintain its environmental health, while abiding by the standards put in place by both the federal and state government. Additionally, the RGVMPPO should consult with regulatory agencies at all levels to ensure their planned activities are in accordance with policy. Regulatory agencies can play a key role in helping to identify any major impacts that future transportation projects may have on the surrounding environment.

⁷ https://www.environment.fhwa.dot.gov/nepa/trans_decisionmaking.aspx