CULTURAL ASSESSMENT
IN SUPPORT OF GREENHOUSE GAS PERMITTING FOR REQUIRED WPH BOILERS NO_X CONTROLS

INVISTA S.à r.l.
Victoria County, Texas

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA), REGION 6
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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effects
BCE	before common era
CA	Cultural Assessment
CEI	Coastal Environments Inc.
CFR	Code of Federal Regulations
CO	carbon monoxide
ESLs	Effects Screening Levels
GHG	greenhouse gas
INVISTA	INVISTA S.à r.l.
m	meter
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NH_3	ammonia
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NO_x	nitrogen oxides
PSD	Prevention of Significant Deterioration Program
SAL	State Archeological Landmark
SHPO	State Historic Preservation Officer
SILs	Significant Impact Levels
SO_2	sulfur dioxide
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
WPH	West Powerhouse

EXECUTIVE SUMMARY

INVISTA S.à r.l. (INVISTA) submitted a greenhouse gas (GHG) permit application to U.S. Environmental Protection Agency (USEPA) Region 6 to obtain a Prevention of Significant Deterioration (PSD) permit authorizing the installation of nitrogen oxide (NO_x) controls required by a USEPA Consent Decree and modifications to the existing boilers and fuel system piping at the INVISTA Victoria Plant West Powerhouse (WPH).

USEPA's issuance of a GHG PSD permit to INVISTA is an action subject to requirements pursuant to the National Historic Preservation Act (NHPA). This Cultural Assessment (CA) was performed pursuant to the requirements of the NHPA, and includes a desktop review of the potential project impacts on historic properties or other culturally significant features or landscapes by a Principal Investigator as defined by 36 C.F.R. Part 61, Appendix A. The assessment focused on the potential for direct and indirect effects of project-related construction, and operations on historic properties or other culturally significant features or landscapes within a designated Area of Potential Effects (APE). Archeologists did not conduct additional field work as a part of this project.

The geographic boundaries of the APE were established based on the direct impacts from construction and operation of the facility. The APE boundaries for construction and operation include the existing WPH process areas and structures and the associated construction laydown area. INVISTA also took into consideration whether the APE extends beyond the construction and operation area as a result of indirect impacts during construction or operation. The APE associated with project construction and operation was not expanded due to indirect impacts including noise, viewshed or atmospheric impacts.

The APE for the project is entirely contained within the industrial area of the INVISTA Victoria Plant. The project does not include digging or ground disturbance outside already developed plant areas. The APE is absent of any culturally significant features or landscapes. Consequently, EPA action in issuing a PSD permit to INVISTA for the WPH pollution control project at its Victoria Plant will have no effect on cultural resources for purposes of the National Historic Preservation Act because no cultural, historical, or archeological resources are present within the APE for the project.

1 PROJECT DESCRIPTION

1.1 PROJECT LOCATION AND SCOPE

The INVISTA S.à r.l. (INVISTA) Victoria Plant is a nylon intermediates plant located at 2695 Old Bloomington Highway North, south of the city of Victoria in Victoria County, Texas. The plant is situated in a rural area approximately 10 miles south of the city of Victoria at Latitude 28°40'41" North, Longitude 96°57'17" West (Figure 1-1). The West Powerhouse (WPH) at the plant includes four existing boilers that generate steam to support manufacturing process operations. The WPH boilers are fired with a mixture of liquid and gaseous waste fuels (referred to herein as "fuels"), in addition to natural gas as needed to meet steam demand as authorized under Texas Commission on Environmental Quality (TCEQ) Air Quality Permit Number 812 and other existing environmental permits issued to the plant.

A 28 July 2009 Federal judicial Consent Decree between INVISTA, the USEPA, the U.S. Department of Justice, and various State plaintiffs (not including Texas) required INVISTA to install nitrogen oxide (NO_x) controls at the four existing WPH boilers. The Consent Decree was entered, among other things, to resolve an alleged failure to procure Clean Air Act Prevention of Significant Deterioration (PSD) permits for projects affecting the WPH emission units that occurred before INVISTA acquired the site in April 2004. The requirements of the Consent Decree and the resulting installation of NO_x control technologies for the WPH boilers were also incorporated into a 31 March 2010 Compliance Agreement between INVISTA and TCEQ. The Consent Decree requires that the installation of NO_x controls on the first boiler be completed by 31 December 2013, on a second boiler by 31 December 2015, and on the remaining two boilers by 31 December 2016. To meet these Consent Decree deadlines, INVISTA must begin construction of the project by 1 May 2013.

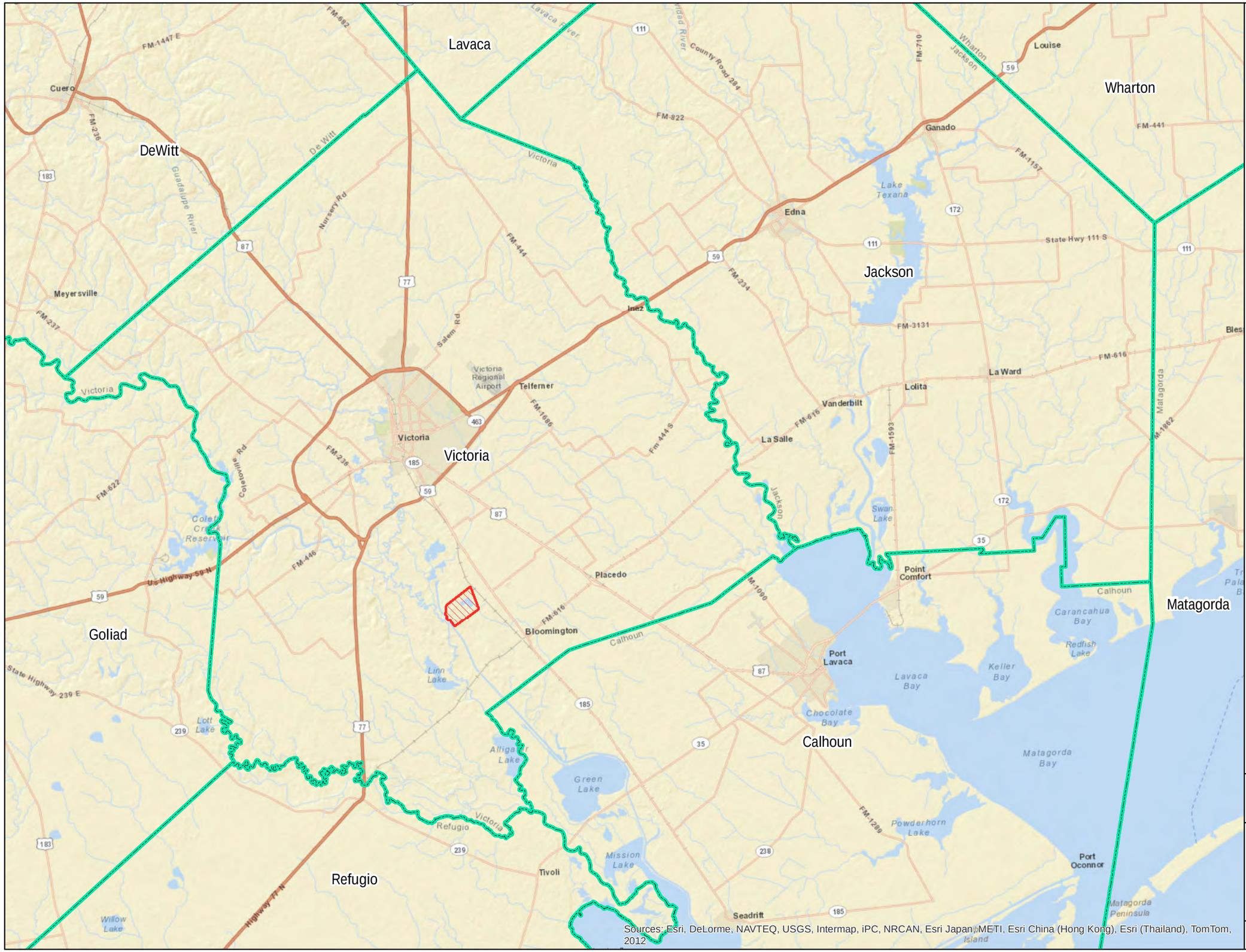
Retrofitting the existing WPH boilers with the required new NO_x control systems and the other boiler and fuel system modifications will increase greenhouse gas (GHG) emissions from the WPH and trigger PSD permitting requirements for GHGs. Consequently, INVISTA submitted a GHG PSD permit application to USEPA on 16 March 2012. That application seeks approval for the following: 1) the installation of air pollution controls to reduce NO_x emissions from the four existing WPH boilers, including selective non-catalytic reduction systems to meet Consent

Decree and TCEQ Compliance Agreement requirements, as well as low-NO_x burners for additional NO_x reductions; 2) modifications to the existing WPH boilers, including re-tubing, operational flexibility and efficiency improvements, and boiler modernization, as necessary; and 3) associated modifications to fuel system piping. Details of the project were presented in the INVISTA West Powerhouse Greenhouse Gas Permit Application submitted to USEPA in March 2012.

1.2 PURPOSE FOR THE CULTURAL ASSESSMENT

USEPA Region 6 is the Federal agency with authority over GHG PSD permitting in Texas, and is subject to certain Federal environmental requirements including those pursuant to the National Historic Preservation Act (NHPA) (16 U.S.C. § 470, et seq.), the Historic Sites Act (16 U.S.C. § 461, et seq.), the Archeological and Historic Preservation Act (16 U.S.C. § 469, et seq.), and Executive Order 11593, "Protection and Enhancement of the Cultural Environment," among others. This CA is being submitted to support USEPA Region 6 in its compliance with Section 106 of the NHPA.

Section 106 of NHPA (16 U.S.C. § 470) and its revised regulations (36 C.F.R. Part 800) require USEPA to take into account the effects of its Federal actions (*e.g.*, any action authorized, funded, or carried out by USEPA) on historic properties, and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on those undertakings. Historic properties are defined in Federal law as those properties that are listed in, or meet the criteria for listing in, the National Register of Historic Places (NRHP). This is typically carried out through consultation with the State Historic Preservation Officer (SHPO), and in the case of projects involving tribal lands, with the tribal representative. This CA reviews the potential effects of project-related construction, operations, and air emissions on historical properties or other culturally significant features or landscapes within a designated APE.



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

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FIGURE 1-1
PLANT LOCATION MAP
INVISTA S.à r.l.
VICTORIA COUNTY, TEXAS

DATE	PROJECT NO	SCALE
NOVEMBER, 2012	13393.017.002.0020	AS SHOWN

2 EVALUATION AND IDENTIFICATION OF THE AREA OF POTENTIAL EFFECT

The evaluation of cultural resources likely to be affected by the action is focused on impacts within the project APE. As defined by 36 C.F.R. § 800.2(c), an APE is a "geographic area or areas within which an undertaking may directly, indirectly, or cumulatively cause changes in the character of historic properties that make them ineligible for listing in the National Register of Historic Places (National Register), if any such properties exist." An APE may includes the limits of direct physical disturbance as well as indirect atmospheric changes due to potential air pollutant emissions or noise associated with a project

The evaluation of project effects on cultural resources compares the existing or environmental baseline conditions within the APE to conditions after the implementation of the proposed project. By comparing the baseline with the proposed future conditions, the effects of the proposed project on cultural resources are measured independent of other effects and the incremental effects of the proposed action on designated resources are isolated.

2.1 AREA OF POTENTIAL EFFECTS DELINEATION METHODOLOGY

The geographic boundaries of the APE were established using an evaluation of the direct impacts from construction and operation of the project and the evaluation of indirect impacts of noise, visual changes and air emissions. A description of the effects resulting from the direct and indirect factors is provided in the following sections.

2.1.1 Direct Impacts: Construction and Operating Area Analysis

INVISTA evaluated the proposed project for direct impacts associated with construction and operation of the project. This project installs emissions controls (low NO_x burners and selective non-catalytic reduction (SNCR) technology) on and refurbishes four existing boilers. Construction associated with the project is limited to modifications to existing process and operations (*e.g.*, multi-use contractor parking / equipment laydown) and structures, and will not result in an increase to the overall footprint of the current WPH facility, nor result in an increase to the height of the facility. The construction-related activities associated with this project, including traffic, will not vary from those typical of normal maintenance and turnaround

activities for the INVISTA Victoria Plant and the WPH area. The construction-related activities will take place within existing facilities and on existing concrete slabs and gravel-paved areas.

Construction Impacts:

Digging or ground disturbance related to the project will be limited to an approximately 5800-square feet area within the previously disturbed plant area. No digging or ground disturbance outside the already developed, previously disturbed plant footprint will be associated with the project. Within the developed plant area equipment slabs will be installed to a depth of 3 to 4 feet (ft) below ground surface (bgs). An approximately 150 square ft storm water sump will be installed to a depth of 8 ft bgs. Piers for the project related urea tank will be installed to a depth of 20 ft bgs via augering rather than excavation.

Photo 1: View of West Powerhouse, existing tank slab, column footings, and paved roadway.

All excavation associated with the project will be within the footprint of the existing plant, and within areas previously disturbed for plant construction. In 1986 the ground in the project area was disturbed to a depth of 12 ft bgs for the installation of pipe rack foundations. Additionally, excavation ranging from 2 ft to 14 ft bgs was performed for the installation of various pipes and water lines. In 2011 additional digging was performed to approximately 10 ft bgs for the installation of a flare foundation. Other previous ground disturbances have occurred in the area including installation of a sump to approximately 12 ft bgs, catch basins to approximately 7 ft bgs, soil borings to 30 ft bgs, and paved roads to approximately 4 ft bgs. Figure 2-2 shows and overlay of the planned excavation areas, in yellow, on the current plot plan which shows historical soil disturbances in red and blue.

Photo 2: View of West Powerhouse, column footings, and paved roadway.

As shown in photographs 1, 2 and 3, the WPH project area is within the INVISTA Victoria Plant where similar ground disturbance has occurred during the construction of the plant processes.

Photo 3: View of existing flare, cogeneration unit, column footings, and paved roadway

Other Direct Impacts:

The dust and light levels generated through the project construction and operation will not exceed those associated with typical daily facility activities. Finally, a small increase in water usage and non-contact stormwater will result from project operations. Additional wastewater due to the project operations will be routed to the existing wastewater treatment system. Wastewater volumes will be consistent with current volumes and characteristics of typical wastewater generated through normal maintenance and other routine activities associated with the facility, and within existing permit limits. Impacts associated with the construction and operations are expected to be equivalent to, or less than, those due to routine operations associated with the current facility. Accordingly, the APE, based on the direct effects, is defined by the approximately 12-acre footprint of the WPH and the construction/laydown areas shown on Figure 2-1 (*see* "West Powerhouse Project Area of Potential Effects").

2.1.2 Indirect Impacts: Visual and Atmospheric Effects

INVISTA also evaluated the limits of the APE as a consequence of visual impacts, noise volume, or atmospheric effects due to air pollution emissions.

Visually, the WPH facility will remain an industrial process area, with no changes to the overall size and height of the facility. The WPH is within the larger INVISTA Plant, the view of the WPH will not change due to the project. The views from the WPH will continue to be limited to the surrounding industrial areas of the Plant. No archeological or historical sites are viewable from the WPH facility and the views of the INVISTA facility from the archeological and historical sites in the vicinity will not change due to this project.

The noise levels generated through the project construction and operation will not exceed those associated with typical daily facility activities.

The project triggers PSD for GHG only and, as such, PSD modeling for criteria pollutants is not required. INVISTA has voluntarily reviewed the results of air modeling to evaluate if the potential indirect effects of air pollutant emissions contribute to the geographical boundaries of the APE. The modeling results show that neither Significant Impact Levels (SILs) nor Effects Screening Levels (ESLs) were exceeded at any location.

2.2 DETERMINATION OF AREA OF POTENTIAL EFFECTS

The potential for effects related to this project is limited to the approximately 12-acre area in which construction and operation will take place. Increases in noise, dust, traffic, or light are not expected during the construction or operation associated with the project. As described in Section 2.1.2, changes in the viewsheds related to the WPH will not result from the project because the surrounding area of the proposed construction is already industrial. Additionally, all projected atmospheric effects related to emission impacts of the project are below established SILs or ESLs for each modeled air pollutant, and there is only a *de minimis* change in the projected air emission concentrations when compared to existing concentrations. Therefore, indirect effects, including visual and atmospheric effects, do not result in an expansion of the APE beyond the project construction area. Furthermore, because no incremental increases in noise, dust, traffic, or light or changes in views are expected during the construction or operation phases of the project, these factors do not result in an APE beyond the project construction area. Accordingly, the APE is the project construction area as set forth in Figure 2-1.

LEGEND

- INVISTA Victoria Plant Operating Area
- West Power House Project Area of Potential Effects

N

0 0.25 0.5

Miles

SOURCE: (c) 2010 Microsoft Corporation and its data suppliers

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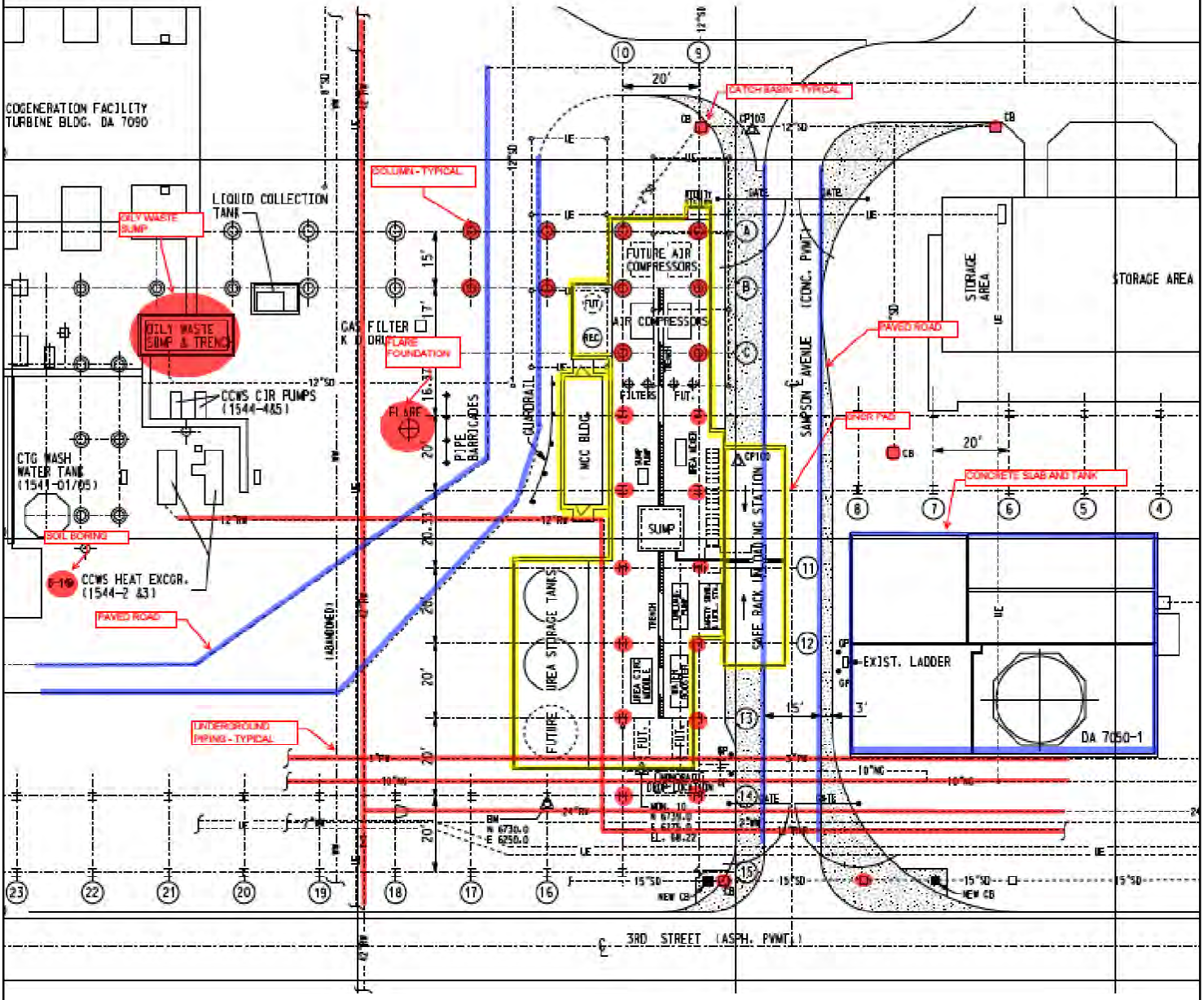
FIGURE 2-1
AREA OF POTENTIAL EFFECTS
INVISTA S.à r.l.
VICTORIA COUNTY, TEXAS

DATE	PROJECT NO	SCALE
NOVEMBER, 2012	13393.017.002.0020	AS SHOWN



LEGEND

- Proposed Slab
- Existing Soil Disturbances
- Existing Roadways and Slabs

N

SOURCE: West Powerhouse Boiler SNCR Project, INVISTA S.a.r.l. 2012.

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FIGURE 2-2
WEST POWER HOUSE EXISTING AND NEW FACILITIES
VICTORIA COUNTY, TEXAS

DATE	PROJECT NO	SCALE
JANUARY, 2013	13393.017.002.0020	APPROX.

3 REGIONAL SETTING

Victoria County is located in southeastern Texas on the Coastal Plain and comprises 887 square miles. According to the U.S. Department of Agriculture (USDA) Soil Conservation Service, the project area falls within the Lake Charles – Urban land complex of soils (NRCS, 2012). The underlying geology of the project area is Quaternary-aged Beaumont Formations composed of clay, silt, sand, and gravel deposited along waterways within the past 2.6 million years. The formations vary from mainly clay and silt, to mainly clay and mud (BEG, 1992).

The local region is characterized by level to gently rolling prairies with primarily dark clay loams that support bluestems and tall grasses, oak forest, mesquite, prickly pear, and other related native vegetation (Roell, 2012). Most of the regional native coastal prairie is now pastureland, cropland, or residential, urban, commercial, and industrial development. The area surrounding the INVISTA facility is primarily undeveloped brushland associated with rangeland and abandoned or active agricultural lands. The INVISTA plant area includes approximately 1,400 acres of industrial development. The project APE includes approximately 2 acres within the plant boundary. The Victoria barge canal is directly west and southwest of the INVISTA facility, and the Guadalupe River is approximately 2,000 meters (m) west of the WPH project area (see Figure 2-1).

3.1 HISTORIC OVERVIEW OF VICTORIA COUNTY

The earliest civilizations in the Guadalupe Bay region were in the Late Archaic period, approximately 7000 before common era (BCE) (Perttula, 2004). Occupation in the region occurred again between 6,000 and 4,000 years ago (Perttula, 2004). Starting around 3,000 years ago, or circa 1,000 BCE, there is abundant evidence of major occupation, and fishing became an increasingly important part of the culture (Perttula, 2004). The site was later re-occupied by ceramic-producing people (circa 1150 to 1700 common era (CE)) of the Late Prehistoric period. A relatively large quantity of artifacts, including both stone tools and pottery, along with freshwater fish species and bison remains, are common from this time period (Roell, 2012).

The Karakawa group, a band of coastal people, was first included in the historical record in 1528. The indigenous coastal people practiced a mix of subsistence culture including intensive

fishing, hunting, and gathering (Lipscomb, 2012). Bones and shells were used for the production of tools and ornaments.

Victoria was among the original 23 counties established by the First Congress of the Republic of Texas on 17 March 1836. Its modern boundaries were defined by the Texas legislature on 31 March 1846 (Roell, 2012). Until oil was discovered in the 1930s, Victoria County's economy was primarily agrarian. The first mineral leases were executed soon after the Spindletop discovery in 1900, and the first commercial oil and gas wells were drilled in 1930 (Roell, 2012).

3.2 SITE VISITS

Site visits were conducted of the facility and surrounding area in March 2012 and June 2012. The APE for the project area was observed to include industrial facilities, concrete roads, and gravel surfaces. See Photo 4. The APE is entirely within previously disturbed ground surfaces. A reconnaissance survey of the regionally known cultural and historical resources, along with general observations of local structures and setting within approximately three kilometers of the APE was performed by automobile and on foot. Regional archeological sites identified through a review of the Texas Historical Commission (THC) *Texas Archeological Sites Atlas* (Online) were identified and observed during the site reconnaissance. Detailed descriptions of each of the sites are provided in Section 3.4 of this report. A historical bridge (41VT113) was observed to be largely inaccessible due to

Photo 4: View within APE.

Photo 5: View of entrance and barrier by a historic bridge (41VT113).

vegetative growth. See Photo 5. The bridge is constructed of both wood and metal and, based on the associated entrance fencing, was likely used for the movement of cattle or other livestock across the Guadalupe. The Buckeye Knoll site (41VT98), a site with buried prehistoric deposits, was observed to be fenced from public access and included warning signs. No other sites identified in the Texas Archeological Site Atlas were observed to have above ground features, or identifying marks. No other above ground structures with features indicating historical or cultural significance were observed during the site visit.

Photographs of the site and surrounding area taken in June and November 2012 are shown below. The locations of the various photographs in relation to the INVISTA facility are provided on Figure 3-1.

Photo 6: View of barge canal and INVISTA facility (distance) from near Buckeye Knoll site (41VT98).

Photo 7: View of the INVISTA facility operating area fence line, looking south.

Photo 8: View to the south from the INVISTA facility property boundary.

Photo 9: View to the east from the facility property boundary

3.3 AREA OF POTENTIAL EFFECTS CULTURAL SETTING

As discussed in Section 2.2 of this report. The APE for the project is entirely contained within the industrial area of the INVISTA facility, and covers 12-acres. The entire APE is contained within previously disturbed ground. The construction will result in no changes to the existing viewshed. Based on the review of the THC *Texas Archeological Sites Atlas* (Online), no listed or potentially-eligible-for-listing sites are located within the APE.

3.4 REGIONAL CULTURAL SITES

Although there are no cultural sites within the APE, the THC Atlas was reviewed online in April 2012 by an AmaTerra Environmental, Inc. (AmaTerra) Principal Investigator, meeting the requirements of 36 C.F. R. 61 (*see resumes in* Appendix B), and an in-person, follow-up visit to the Texas Archeological Research Laboratory was performed to review archeological site files, architectural resource files, and previously conducted cultural resource surveys in the vicinity of the proposal project. Amaterra concluded:

> *[…] based on the level of presumed ground disturbance within the project area, there is little potential for intact archeological sites to be present at the project location. Further, improvements to the existing plant within the project area would have no effect on National Register listed properties, cemeteries, historic markers, shipwrecks, or buildings recorded by neighborhood surveys.*

Eight previously recorded archeological sites are present within three kilometers of the INVISTA facility. As shown in Figure 3-2, the sites are generally located along the barge canal to the west of the facility and more than 1,000 m from the APE. The sites were primarily identified during the dredging activities associated with the building of the Victoria Barge Canal. Three of the eight sites were not recommended as having potential for listing on the NRHP or as a State Archeological Landmark (SAL). One site had no recommendation, and its status remains undetermined. Four sites were recommended for listing on the NRHP or as a SAL. The approximate site locations in relation to the APE are shown on Figure 3-2. A detailed description of each of the archeological sites is provided below. The THC *Texas Archeological Sites Atlas* File Search is provided in Appendix B.

Site 41VT79

Site 41VT79, known as the Sentinel Oak Site, was recorded in 1980 during construction of a new road. See Photo 10. It consists of an open campsite with both prehistoric and historic artifacts. The assemblage included lithic tools and debris, faunal material, and ceramics. The ceramics recorded were Native American ceramics as well as imported European and Oriental varieties. Controlled excavations took place at the site in 1981. These consisted of 2 2x2 foot test pits and 6 5x5 foot test units which recovered a variety of nineteenth century artifacts, as well as prehistoric choppers, bifaces, scrapers and projectile points representing the Late Archaic through Late Prehistoric periods. Of particular interest was a cache of five bifaces found just above basal clay in one of the test units. Ultimately, work determined that most of the site was already disturbed by preparations for roadway construction and that there was little remaining integrity. The site records do not specify the potential for listing on the National Register of Historic Places (NRHP) or as a State Archeological Landmark (SAL) and therefore the site's eligibility status is still unknown. Because the site's status is unknown, it is potentially eligible to be listed on the NRHP.

Site *41VT79* is located on private land approximately 1200 meters northwest of the APE. There are no above-ground artifacts associated with this site. Site *41VT79* is located outside the APE and therefore would not be affected by the project. The nearest construction activities associated with the project will be approximately 1200 meters from the site. No impacts to the site by traffic or by changes in the viewshed will be present due to the project.

Site 41VT94

Site 41VT94, known as the Blue Bayou Site, was first recorded in 1982 as an occupation site with prehistoric burials. See Photo 11. The Center for Archaeological Research (CAR) at the University of Texas San Antonio (UTSA) conducted excavations that same year and removed 42 sets of human remains together with Late Prehistoric ceramics and arrow points. The human

Photo 10: View in the vicinity of 41VT79.

Photo 11: View in the vicinity of 41VT94.

remains were dated to the early Late Prehistoric period. The project was led by Thomas Hester, Jake Ivy, Grant Hall and Al Wesolowsky. Due to the abundant data on prehistoric mortuary patterns the site has yielded, it is considered eligible for listing on the NRHP and as a SAL but is not currently designated.

Site *41VT94* is located on private land approximately 1800 meters northwest of the APE. There are no above-ground artifacts associated with this site. Site *41VT94* is located outside the APE and therefore would not be affected by the project. The nearest construction activities associated with the project will be approximately 1800 meters from the site. No impacts to the site by traffic or by changes in the viewshed will be present due to the project.

Site 41VT98

Site 41VT98, known as the Buckeye Knoll Site, was recorded in 1982 as being bisected by the Victoria Barge Canal. See Photos 12 and 13. Initial findings noted that the site had several lenses of snail shell and some lithic flakes and cores. It was tested by Coastal Environments, Inc (CEI) in 1989 and 1991 and it was during these investigations that abundant intact stratified prehistoric deposits representing the Late Paleoindian through Late Prehistoric periods were uncovered. Additionally, archeologists found several fragments of human bone. Data Recovery took place at the site from 2000-2001 and uncovered the remains of more than 116 individuals from 75 discrete loci, as well as hundreds of other occupation features. Most of the burials date to the Early Archaic period, making them around 6,000 years old (Ricklis et al 2012). Site 41VT98 is today regarded as one of the most important sites in Texas for the data it has yielded relating to prehistoric lifeways along the inland coast. Although much information has already been gained from excavation of the site, a good portion of the site still remains intact and unexcavated. The site is considered eligible for NRHP and SAL listing though it is not currently listed as either.

Photo 12: View of 41VT98, Buckeye Knoll site, with fence and warning sign.

Photo 13: View from 41VT98, towards the WPH and APE.

Site 41VT98 is located on private land approximately 2000 meters from the APE, west of the barge canal and east of the Guadalupe River. There are no above-ground artifacts associated with this site. Site 41VT98 is located outside the APE and therefore would not be affected by the project. The nearest construction activities associated with the project will be approximately 2000 meters from the site. No impacts to the site by traffic or by changes in the viewshed will be present due to the project.

Site 41VT99

Site 41VT99 was recorded in 1989 by CEI as a stratified prehistoric occupation site. See Photo 14. It was resurveyed and tested through backhoe trenches and 2 1x1 meter units in 1993 by Prewitt and Associates, and was recommended as eligible for NRHP/SAL listing because of its intact, stratified deposits that had potential to yield important data on prehistoric lifeways.

Photo 14: View of 41VT99 form the west bank of the barge canal.

Site *41VT99* is located on private land approximately 1500 meters from the APE, along the barge canal. There are no above-ground artifacts associated with this site. Site *41VT99* is located outside the APE and therefore would not be affected by the project. The nearest construction activities associated with the project will be approximately 1500 meters from the site.

No impacts to the site by traffic or by changes in the viewshed will be present due to the project.

Site 41VT101

Site 41VT101 was recorded in 1989 as an Early Archaic to Late Prehistoric site. See Photo 15. A local informant said that in the early 1950's he collected an Ensor point from the site location. However, the site form notes that most of the site was destroyed by the 1950s Barge Canal construction and that it currently lacks integrity. For these reasons, the site was recommended as being not eligible for listing on the NRHP or as a SAL.

Site *41VT101* is located on private land approximately 1200 meters from the APE, along the barge canal. There are no above-ground artifacts associated with this site. Site *41VT101*is located outside the APE and therefore would not be affected by the project. The nearest construction activities associated with the project will be approximately 1200 meters from the site. No impacts to the site by traffic or by changes in the viewshed will be present due to the project.

Photo 15: View looking south towards 41VT101, 41VT102 and 41VT103 form the west bank of the barge canal.

Site 41VT102

Site 41VT102 was recorded in 1989 as a small surficial lithic scatter with no diagnostic artifacts. See Photo 15. Given the small amount of material and the surficial nature of the site, investigators judged it to have no potential to yield significant new data about prehistoric lifeways. Therefore, the site was recommended as not eligible for listing on the NRHP or as a SAL.

Site *41VT102* is located on private land approximately 1000 meters from the APE, along the barge canal. There are no above-ground artifacts associated with this site. Site *41VT102* is located outside the APE and therefore would not be affected by the project. The nearest construction activities associated with the project will be approximately 1000 meters from the site. No impacts to the site by traffic or by changes in the viewshed will be present due to the project.

Site 41VT103

Site 41VT103 was recorded in 1989 as a small lithic scatter and a snail shell midden under several meters of dredge material. See Photo 15. Recorders were not able to accurately assess the site through shovel tests due to dredge spoil over the top of it. They recommended additional shovel testing or backhoe trenching to better assess the vertical and horizontal extent of the site, as well as the cultural features and artifacts within it. Test pits and backhoe trenches were excavated in 1995 and based on work that suggested low data potential, the site was recommended as not eligible for NRHP/SAL listing (Gadus et al 1999).

Site *41VT103* is located on private land approximately 1200 meters from the APE, along the barge canal. There are no above-ground artifacts associated with this site. Site *41VT103* is located outside the APE and therefore would not be affected by the project. The nearest construction activities associated with the project will be approximately 1200 meters from the site. No impacts to the site by traffic or by changes in the viewshed will be present due to the project.

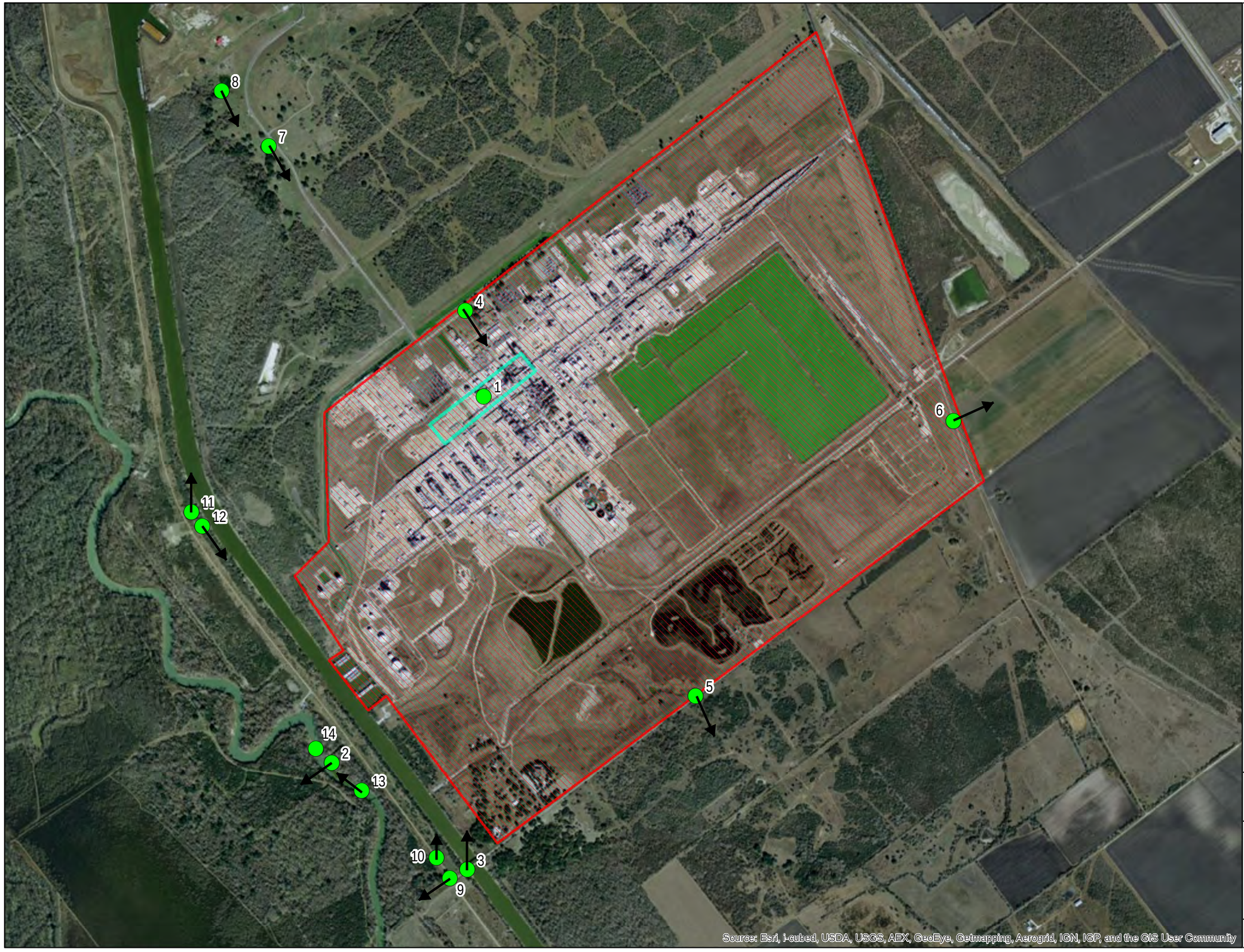
Site 41VT113

Site 41VT113 was recorded in 1993 as a historic suspension bridge over the Guadalupe River. See Photos 16 and 17. The bridge dates to the early 20th century and was used to move cattle across the river before the cattle were loaded onto vehicles for transport. The site form indicated that the bridge is an unusual property type within the context of agriculture in Texas, and recommended that data concerning its construction and use should be collected. For these reasons this site was recommended as eligible for listing on the NRHP and/or as a SAL.

Photo 16: View of Site 41VT113.

Site 41VT113 is located on private land approximately 1800 meters from the APE, over the Guadalupe River. There is no access to the bridge from public lands or public right-of-ways other than passing under the bridge on the Guadalupe River, as shown in photos 16 and 17. Site *41VT113* is located outside the APE and therefore would not be affected by the project. The nearest construction activities associated with the project will be approximately 1800 meters from this site. No impacts to the site by traffic or by changes in the viewshed will be present due to the project.

Photo 17: View of Site 41VT113.



LEGEND

- INVISTA Victoria Plant Operating Area
- West Powerhouse APE
- GPS Photo Locations

N

0 1,300 2,600

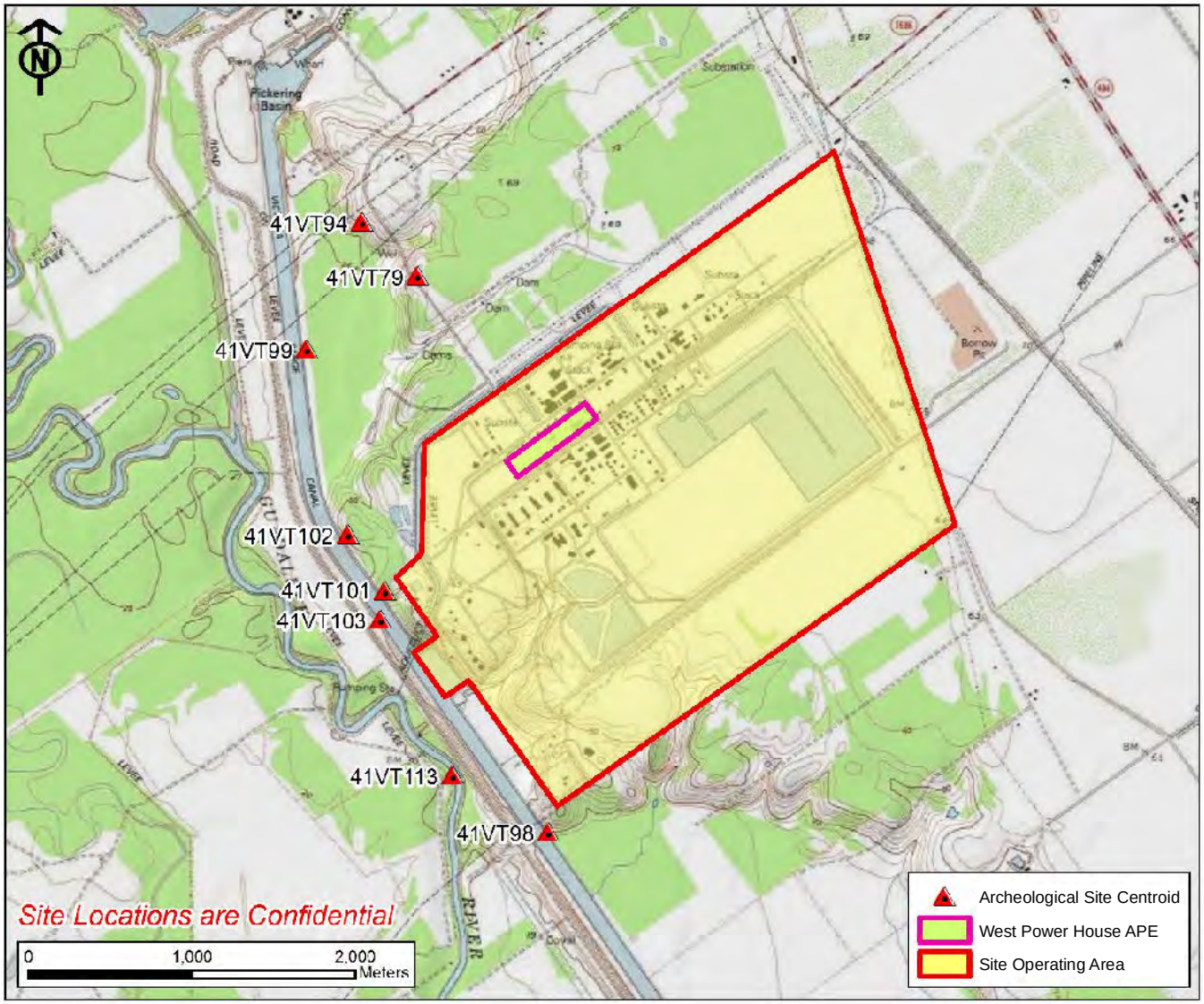
Feet

WESTON SOLUTIONS

FIGURE 3-1

PHOTO LOCATION MAP
INVISTA S.à r.l.
VICTORIA COUNTY, TEXAS

DATE	PROJECT NO	SCALE
NOVEMBER, 2012	13393.017.002.0020	AS SHOWN



SOURCE:
1. Figure 2. Project area, previously identified archaeological sites and THC Data, Cultural Resource File Search, Invista Plant in Victoria County, Texas, AmaTerra Environmental, Inc, April 2012

2. Site centroids are intentionally approximate and do not represent site boundaries.

3. U.S.Geological Survey, 1:100000 Topographic Sheet, Bloomington, Texas

N

WESTON SOLUTIONS

FIGURE 3-2
PREVIOUSLY IDENTIFIED ARCHAEOLOGICAL SITES AND THC DATA
VICTORIA COUNTY, TEXAS

DATE	PROJECT NO	SCALE
NOVEMBER, 2012	13393.017.002.0020	APPROX.

4 ENVIRONMENTAL EFFECTS ANALYSIS

Under Section 106 of the NHPA and Executive Order 11593, if an EPA action affects any property with historic, architectural, archeological, or cultural value that is listed on or eligible for listing on the NRHP, the Agency shall comply with the procedures for consultation and comments promulgated in 36 C.F.R. Part 800. This Cultural Resource Assessment evaluates whether any direct or indirect effects of the project are likely to cause loss or destruction of any cultural or historic resources.

There are no effects from the proposed project on archeological or cultural resources because there are no cultural resources present within the APE. The APE is contained within an existing industrial facility and has been previously disturbed through construction and industrial processes. Construction activities and operations of the modified boiler, including traffic, noise, and lighting will not impact any of the sites identified in Section 3 of this report. The depths of cultural deposits recovered from the sites described in Section 3 were no greater than 7 ft bgs. Additionally, the regional soil formation encountered approximately 7 ft bgs is an older soil and is not considered to contain cultural material. Previous ground disturbances in the project area were at and below 7 ft bgs, and did not result in discoveries of archeological resources. Therefore, no additional archeological resources are expected to be discovered due to excavation in the construction area.

Regional archeological resources outside of the APE, in the vicinity of the INVISTA facility, are buried, and therefore would not be affected by air pollutant emissions if they were present. Effects associated with deposition in sufficient concentrations to cause a significant change in soil chemistry, thereby increasing the degradation rate for the archeological resource, are not expected, as the emission impacts at all locations, including the locations of archeological resources are *de minimis*. As a result, there will be no impacts from increases in air emissions on any archeological resources from this project.

A historical bridge on the Guadalupe River is also located outside the APE and therefore will not be impacted by air pollutant emissions if they are present. Effects associated with deposition in sufficient concentrations to cause degradation of the bridge are not expected, as the emissions impacts at all locations, including the location of the bridge, are insignificant. Predicted

concentrations of sulfur dioxide at the bridge location were modeled to be less than 0.001 micrograms per cubic meter annually. Details for other projected project related air emission concentrations are provided in Appendix A. A National Park Service study found that significantly higher air pollutant concentrations than those predicted to result from the WPH project (including concentrations of acid rain precursors) were not correlated to degradation rates or conditions of structures including historic steel suspension bridges (NPS, 1995). As the emission impacts at the location of the bridge are *de minimis*, the bridge would not be impacted by increases in air emissions resulting from this project.

5 EFFECTS DETERMINATION AND SUMMARY

EPA's action in issuing a PSD permit to INVISTA for the West Powerhouse project at its Victoria, Texas facility will have no effect on cultural resources for purposes of the National Historic Preservation Act because no cultural, historical, or archeological resources are present within the area of potential effects (APE) of the project.

The APE for the project is entirely contained within the industrial area of the INVISTA Victoria Plant. The APE is absent of any culturally significant features or landscapes. The project includes minimal digging or ground disturbance, and will only occur in previously disturbed and developed, plant areas. There is no increase in the footprint or height of the WPH facility associated with the project. Local and regional traffic, noise, and viewshed qualities will not change as a result of the project.

Regional cultural, historical and archeological resources were evaluated by a Principal Investigator in the preparation of this CA. All regional cultural, historical, or archeological resources are located at least 1000 meters outside the APE and will not be affected by the project.

6 REFERENCES

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APPENDIX A
MODELING RESULTS

AIR QUALITY ANALYSIS
INVISTA S.A R.L. ▪ VICTORIA, TEXAS

WEST POWER HOUSE UNIT

IN SUPPORT OF GREENHOUSE GAS PERMITTING

Prepared by:

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Suite 820
Corpus Christi, Texas 78401
(361) 883-1668

August 2012

Trinity Consultants

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1. PROJECT IDENTIFICATION INFORMATION

INVISTA S.A R.L. (INVISTA) owns and operates a synthetic organic chemical manufacturing plant located in Victoria County, Texas (Victoria Plant). The West Power House (WPH) at the Victoria Plant is authorized under TCEQ Permit Number 812. In March 2012, INVISTA submitted a greenhouse gas (GHG) Prevention of Significant Deterioration permit application to the United States Environmental Protection Agency (U.S. EPA) to authorize the installation of technologies to reduce emissions of oxides of nitrogen (NO_x) from the WPH boilers as well as other modifications to the WPH boilers and fuel system piping.

This Air Quality Analysis was performed in support of the Biological Assessment associated with the GHG permitting effort to determine whether permitted allowable increases in emissions of carbon monoxide (CO), sulfur dioxide (SO_2), ammonia (NH_3) and nitrous oxide (N_2O), as documented in Tables A-4 through A-7 in Appendix A of this report, would result in impacts within or outside of the proposed action area or area of potential effect. The maximum modeled concentrations of the criteria pollutants (CO and SO_2) were compared to their corresponding Significant Impact Levels (SILs) and the maximum modeled concentrations of the non-criteria pollutants (NH_3 and N_2O) were compared to their corresponding Effects Screening Levels (ESLs).[1] As noted in Section 11 of this report, the results for the Air Quality Analysis for each of the pollutants are significantly below the corresponding thresholds.

The modeling methodologies used in the modeling analysis are consistent with current TCEQ and United States Environmental Protection Agency (U.S. EPA) guidelines. The results of the air dispersion analysis conducted are provided in this report and are prepared in accordance with the *Guideline on Air Quality Models (Revised)*, and the TCEQ *Air Quality Modeling Guidelines*.[2,3]

[1] "Effects Screening Levels are screening levels used in TCEQ's air permitting process to evaluate air dispersion modeling's predicted impacts. They are used to evaluate the potential for effects to occur as a result of exposure to concentrations of constituents in the air. ESLs are based on data concerning health effects, the potential for odors to be a nuisance, and effects on vegetation. If predicted airborne levels of a constituent **do not exceed** the screening level, adverse health or welfare effects are not expected. If predicted ambient levels of constituents in air exceed the screening levels, it does not necessarily indicate a problem but rather triggers a review in more depth." *Available at http://www.tceq.texas.gov/toxicology/esl (emphases in original)*.

[2] Code of Federal Regulations, Title 40–Protection of Environment, Part 51, Appendix W, November 9, 2005.

[3] TCEQ, *Air Quality Modeling Guidelines*, RG-25 (Revised), New Source Review Permits Division, Austin, TX, February 1999.

In performing the air quality analysis, a preliminary impacts determination, which considers emissions increases associated with the affected sources at the facility, was performed to determine whether the proposed emissions increases of carbon monoxide (CO), sulfur dioxide (SO_2), ammonia (NH_3), and nitrous oxide (N_2O) will impact the action area or area of potential effect. Table 2-1 provides a summary of the permitted allowable emissions increases of these pollutants by facility.

TABLE 2-1. SUMMARY OF INCREASES IN ALLOWABLE EMISSIONS

FIN	CO		SO_2		N_2O		NH_3	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
15BLR001, 15BLR002	29.90	32.49	0	1.47	46.28	68.28	4.60	19.03
15BLR003, 15BLR004	39.72	44.24	0	1.31	47.67	98.08	6.04	26.17
15FUG	0.21	0.94	0	0	0.54	2.37	0	0

The maximum modeled ground-level concentrations (GLC_{max}) for each criteria pollutant were compared to the corresponding SILs (provided in Table 2-2) and the above mentioned non-criteria pollutants were compared to their corresponding ESLs to determine whether the modeled ground-level concentrations at any receptor are above the corresponding threshold. Because the allowable hourly emissions for SO_2 are decreasing as a result of the project, only the annual SO_2 allowable increases were evaluated to determine potential impacts.

TABLE 2-2. SCOPE OF PROJECT REVIEW

Pollutant	Regulatory Thresholds[1] ($\mu g/m^3$)		
	1-hr	8-hr	Annual
CO	2,000	500	--
SO_2	--	--	1
NH_3	170	--	17
N_2O	4,500	--	450

[1] The regulatory thresholds represent the SIL values for the modeled criteria pollutants and represent the short-term and annual ESL values for the modeled non-criteria pollutants. [4]

The results of the Air Quality Analysis can be found in Section 11.

[4] The latest version of the TCEQ ESL list (3/22/12) was downloaded from http://www.tceq.texas.gov/toxicology/esl/list_main.html#esl_1.

A plot plan depicting the locations of the project affected sources considered in the modeling analysis is provided in Figure 3-1. Figure 3-2 depicts an enlarged portion of the plot plan to provide additional source location detail.

3.1 UTM COORDINATE SYSTEM

In all air quality dispersion modeling analysis input and output data files, the location of emission sources, structures, and receptors are represented in the Universal Transverse Mercator (UTM) coordinate system. The U.S. EPA and the TCEQ require that coordinates for permits and air quality dispersion modeling analysis be represented in the UTM system. The UTM grid was originally created by the Defense Mapping Agency of the United States as a special grid for military use throughout the world.[5] In this grid, the world is divided into 60 north-south zones, each covering a strip 6° wide in longitude. The Victoria Plant is located in UTM Zone 14. In each zone, coordinates are measured north and east in meters. The northing values are measured continuously from zero at the Equator, in a northerly direction. A central meridian through the middle of each 6° zone is assigned an easting value of 500,000 meters (m). Grid values to the east of this central meridian, as in the case of the Victoria Plant, are greater than 500,000. The center of the Victoria Plant is located near UTM coordinates 700,070 m East and 3,173,451 m North, based on the North American Datum (NAD) of 1927.

3.2 SOURCE LOCATIONS

All emission sources at the Victoria Plant included in the analysis are represented as point or volume sources. A detailed discussion of the emission calculations used for each of the emission sources is provided in Section 5 of this report. Documentation of the modeled source IDs, locations, and parameters for the sources included in the Air Quality Analysis is provided in Appendix A of this report.

[5] U.S. Department of the Interior and the U.S. Geological Survey Earth Science Information Center (ESIC), The Universal Transverse Mercator (UTM) Grid Fact sheet, May 1993.

Figure 3-1. Modeled Source Locations

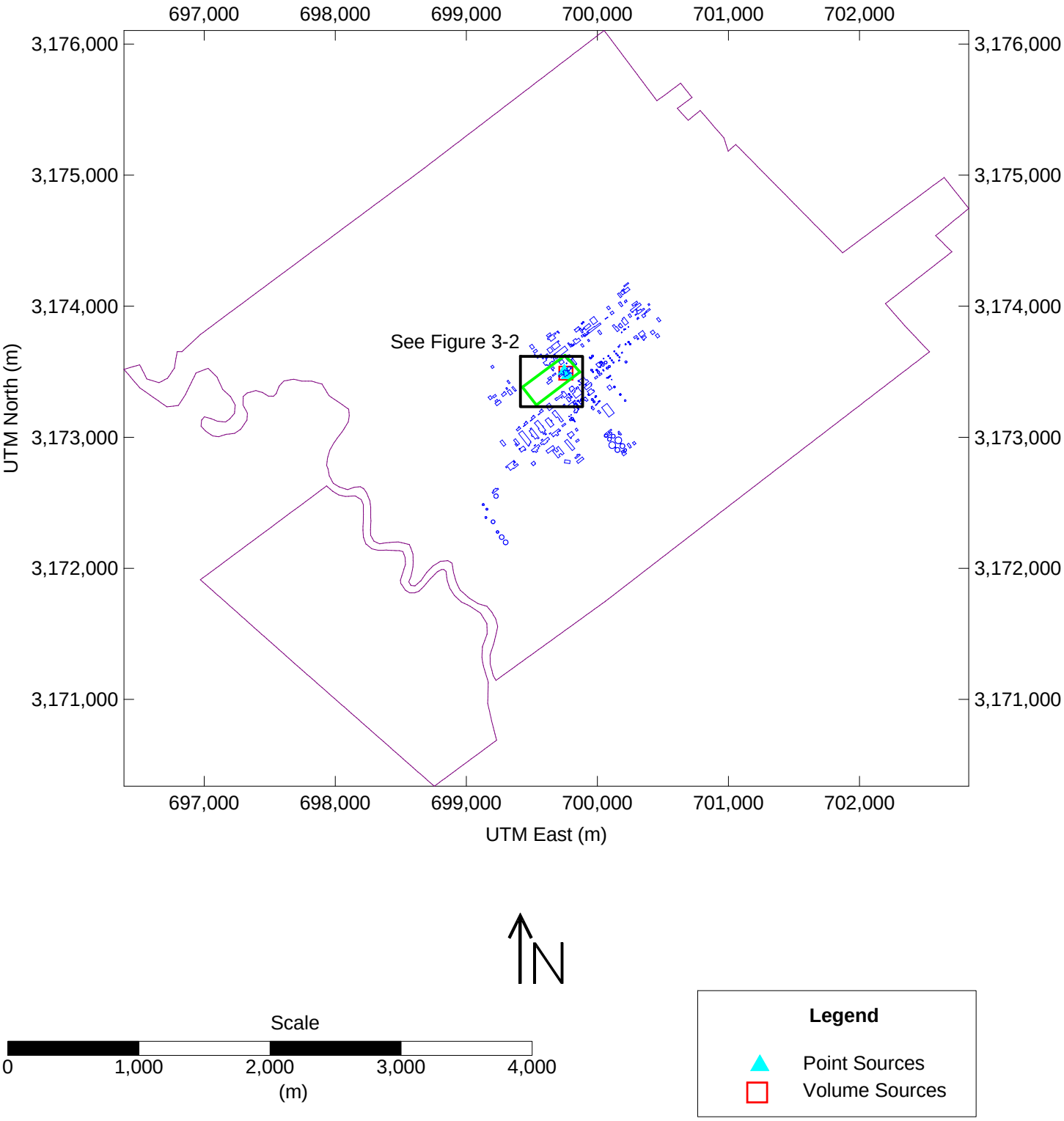
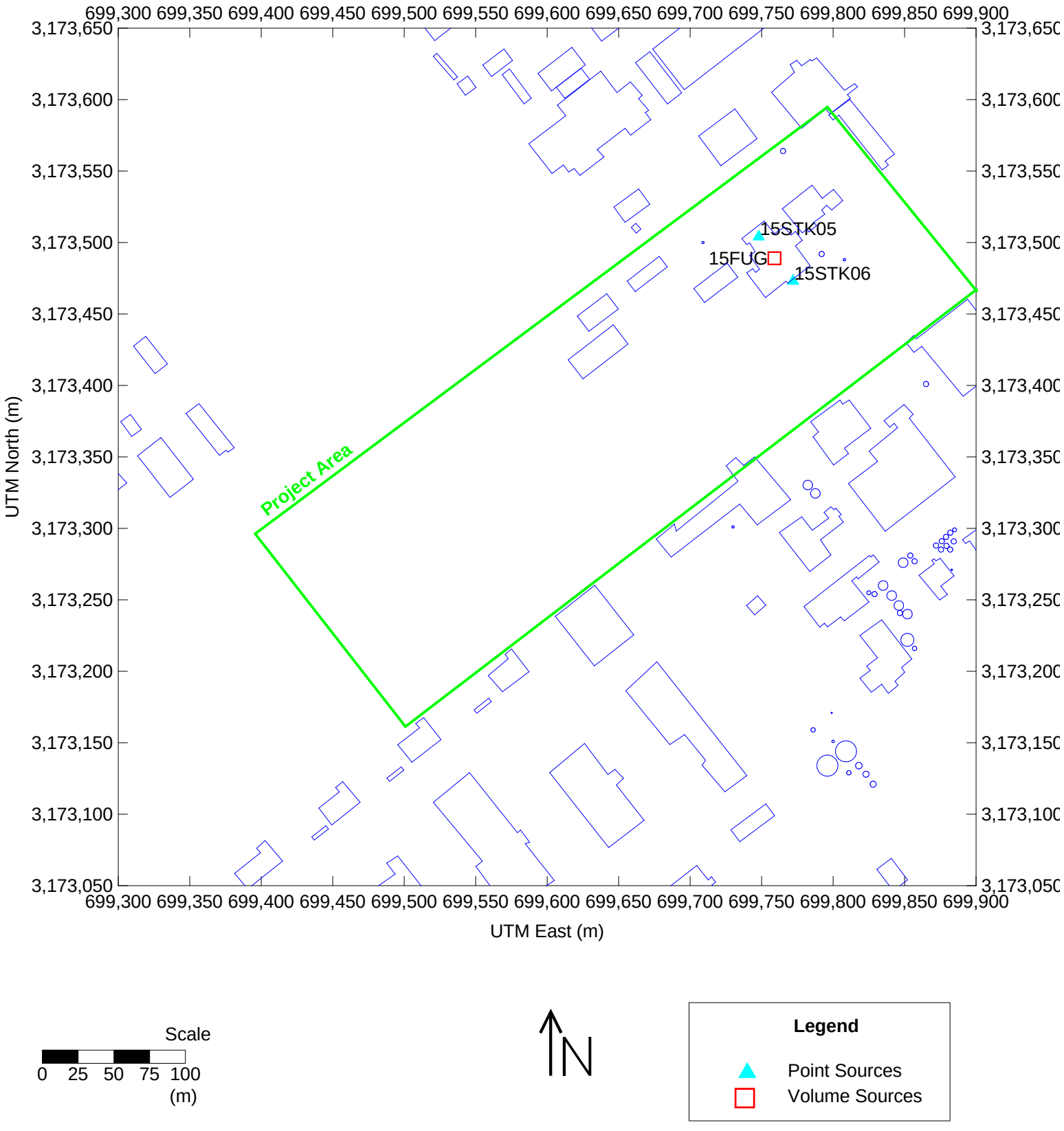


Figure 3-2. Detailed View of Modeled Source Locations



4. AREA MAP

An area map of the INVISTA property line overlaid on the most recent United States Geological Survey (USGS) 1:24,000 scale (7.5-minute series) topographical map is provided in Figure 4-1. The area map depicts the property line with respect to the surrounding topography and predominant geographic features (such as highways, roads, streams, railroads, etc). Additionally, the area map depicts the Project Area, which includes the WPH boiler operating area and associated construction area.

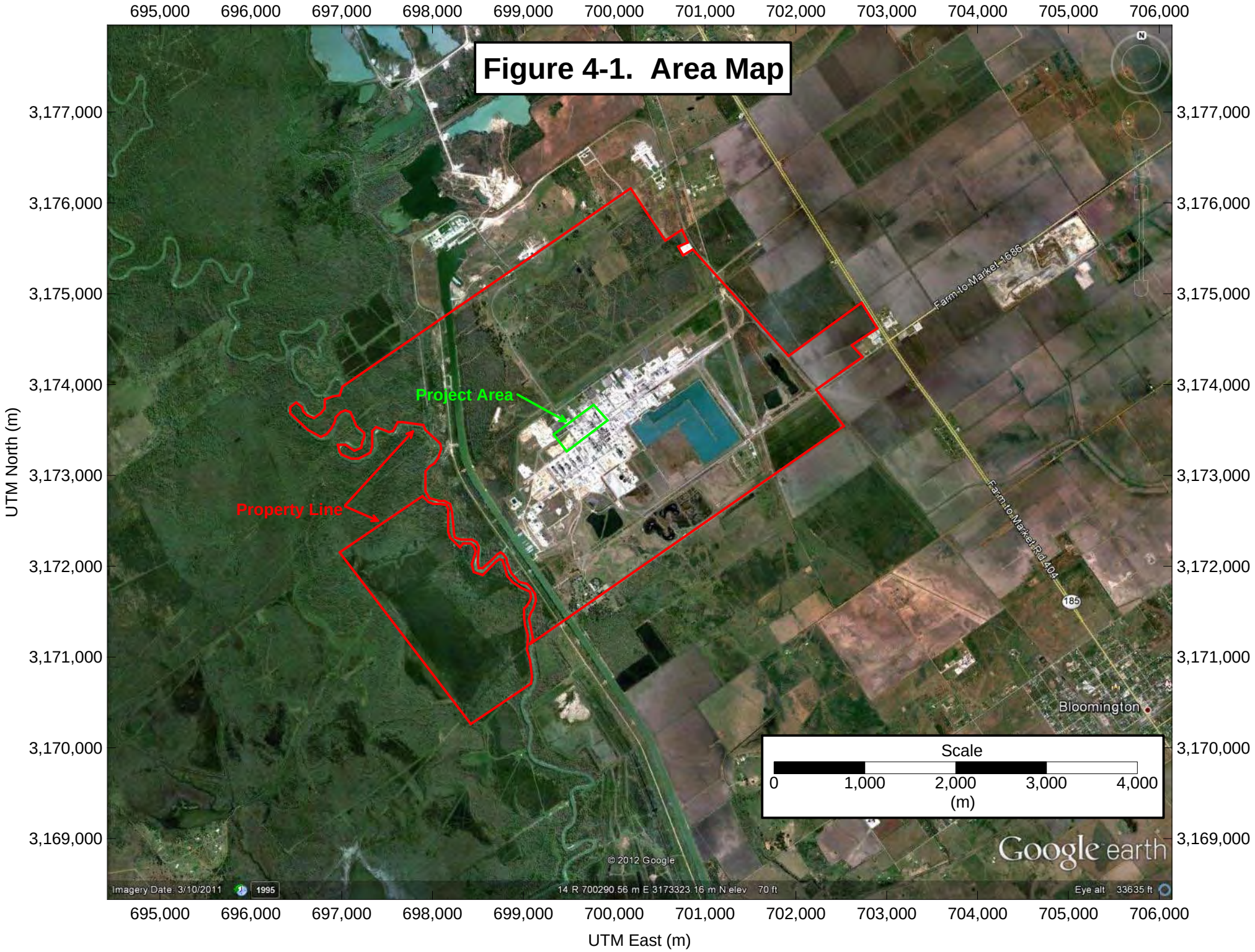


Figure 4-1. Area Map
695,000
696,000
697,000
698,000
699,000
700,000
701,000
702,000
703,000
704,000
705,000
706,000
3,177,000
3,176,000
3,175,000
3,174,000
3,173,000
3,172,000
3,171,000
3,170,000
3,169,000
UTM North (m)
UTM East (m)
Project Area
Property Line
Farm-to-Market-1686
Farm-to-Market-Rd-404
185
Bloomington
Scale
0
1,000
2,000
3,000
4,000
(m)
© 2012 Google
Google earth
Imagery Date: 3/10/2011
1995
14 R 700290.56 m E 3173323.16 m N elev 70 ft
Eye alt 33635 ft

Source parameters and locations for the sources included in the Air Quality Analysis are provided in Appendix A. The sources included in this analysis are classified as point or volume sources. The point sources utilize stack parameters as specified in Table A-1, located in Appendix A of this report, which is consistent with the stack parameters provided in the TCEQ permit application submitted in April 2012. The details for the volume sources considered in the analysis are provided below. The increases in allowable emission rates for each of the pollutants are provided in Table 2-1.

The fugitive emissions increases associated with this project occur due to potential leakages from process piping and equipment located in the west powerhouse building and are represented as a volume source. Table 5-1 provides the basis for the volume source dimensions.

TABLE 5-1. VOLUME SOURCE DIMENSION CRITERIA

Fugitive Source Location	Horizontal Dimension	Vertical Dimension
Process or piping fugitives (including MSS) inside a building	Building length and width	Building height

The volume source parameters are calculated as follows:

- Effective vertical dimension of the volume source (D):

  $D = H_{max} - H_{min}$

- Release height of the volume sources ($H_{release}$):

  $$H_{release} = \left(H_{min} + \frac{D}{2} \right)$$

- Initial horizontal dimension of the volume sources (σ_{yo}):

  - If the volume source is part of a series of volume sources in a pipeline, vent header or a building,

    $$\sigma_{yo} = \frac{W}{2.15}$$

- If the volume source is a standalone source,

$$\sigma_{yo} = \frac{W}{4.3}$$

- Initial vertical dimension of the volume sources (σ_{zo}):

  - If the volume source is elevated,

$$\sigma_{zo} = \frac{D}{4.3}$$

  - If the volume source is on or adjacent to a building or at ground level,

$$\sigma_{zo} = \frac{D}{2.15}$$

where,

H_{min} = Minimum height of the volume source,
H_{max} = Maximum height of the volume source,
D = Effective vertical dimension of the volume source,
W = Width of the volume source,
$H_{release}$ = Release height of the volume source,
σ_{yo} = Initial horizontal dimension of the volume source, and
σ_{Zo} = Initial vertical dimension of the volume source.

Detailed calculations of the volume source parameters are provided in Table A-3, which is provided in Appendix A of this document.

6. SELECTION OF MODEL OPTIONS

The latest version of the AERMOD air dispersion model (version 12060) was used to estimate maximum ground-level concentrations of the pollutants considered in the analysis.

In this analysis, modeling was performed using the regulatory default options, which include stack heights adjusted for stack-tip downwash, buoyancy-induced dispersion, and final plume rise. Ground-level concentrations occurring during "calm" wind conditions are calculated by the model using the calm processing feature. Regulatory default values for wind profile exponents and vertical potential temperature gradients are used since no representative on-site meteorological data are available. As per U.S. EPA requirements, direction-specific building dimensions are used in the downwash algorithms. Table 6-1 summarizes the AERMOD model options employed in this air quality dispersion modeling analysis.

TABLE 6-1. SUMMARY OF AERMOD MODEL OPTIONS

```
*** AERMOD - VERSION  12060 ***
***  INVISTA S.a r.l. - Victoria Plant West Power Plant; AERMOD***        07/23/12
***  SSB88A.ami SO2, Annual, 4/2012, All Grids                 ***        17:40:46

PAGE   1
 **MODELOPTs:  RegDFAULT CONC                                              ELEV


***     MODEL SETUP OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses RURAL Dispersion Only.

 **Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

 **Model Assumes No FLAGPOLE Receptor Heights.

 **Model Calculates PERIOD Averages Only

 **Model Set To Continue RUNning After the Setup Testing.

 **Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE
Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE
Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and
Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =    36.00 ;  Decay
Coef. =    0.000     ;  Rot. Angle =     0.0
Emission Units = GRAMS/SEC                                    ;
Emission Rate Unit Factor =   0.10000E+07
Output Units   = MICROGRAMS/M**3
```

The Victoria Plant is located south of Victoria, Texas just west of Highway 185 in Victoria County. The terrain surrounding the Victoria Plant varies in elevation from 0 feet (0 meters) to 108 feet (33 meters) within 10 km of the Plant.[6] The average elevation at the Victoria Plant is approximately 69 feet (21 meters) above mean sea level.

AERMOD uses advanced terrain characterization to account for the effects of terrain features on plume dispersion and travel. AERMOD's terrain pre-processor, AERMAP, imports digital terrain data and computes a height scale for each receptor from Digital Elevation Model (DEM) data files. A height scale is assigned to each individual receptor and is used by AERMOD to determine whether the plume will go over or around a hill.

The receptor terrain elevations input into AERMAP are the highest elevations extracted from United States Geological Survey (USGS) 1:24,000 scale (7.5-minute series) DEM data for the area surrounding the facility. For each receptor, the maximum possible elevation within a box centered on the receptor of concern and extending halfway to each adjacent receptor was chosen. This is a conservative technique for estimating terrain elevations in that it ensures that the highest terrain elevations are accounted for in the analysis. Source and building elevations are extracted in the same manner, using interpolated elevation values.

[6] Based on USGS Digital Elevation Model (DEM) data used in the analysis.

8.1 BUILDING DOWNWASH DETERMINATION

The emission sources are evaluated in terms of their proximity to nearby structures. The purpose of this evaluation is to determine if stack discharges might become caught in the turbulent wakes of these structures. Wind blowing around a building creates zones of turbulence that are greater than if the building was absent.

Direction-specific building dimensions and the dominant downwash structure parameters used as inputs to the dispersion models are determined using the *BREEZE-WAKE/BPIP* software, developed by Trinity Consultants, Inc. This software incorporates the algorithms of the U.S. EPA-sanctioned Building Profile Input Program with PRIME enhancement (BPIP-PRIME), version 04274. BPIP-PRIME is designed to incorporate the concepts and procedures expressed in the GEP Technical Support document, the Building Downwash Guidance document, and other related documents.

The output from the BPIP-PRIME downwash analysis lists the names and dimensions of the structures, and the emission unit locations and heights. In addition, the output contains a summary of the dominant structure for each emission unit (considering all wind directions) and the actual building height and projected widths for all wind directions. This information is then incorporated into the data files for the AERMOD model.

8.2 BUILDING PARAMETERS

A table which details each structure that is considered in the downwash analysis and its corresponding height is provided in Appendix C. Figure 8-1 is a plot plan depicting the location of the buildings located at the Victoria Plant. Figure 8-2 depicts an enlarged portion of the plot plan showing detailed locations of buildings not captured in Figure 8-1.

Figure 8-1. Location of Nearby Downwash Structures Considered in the Analysis

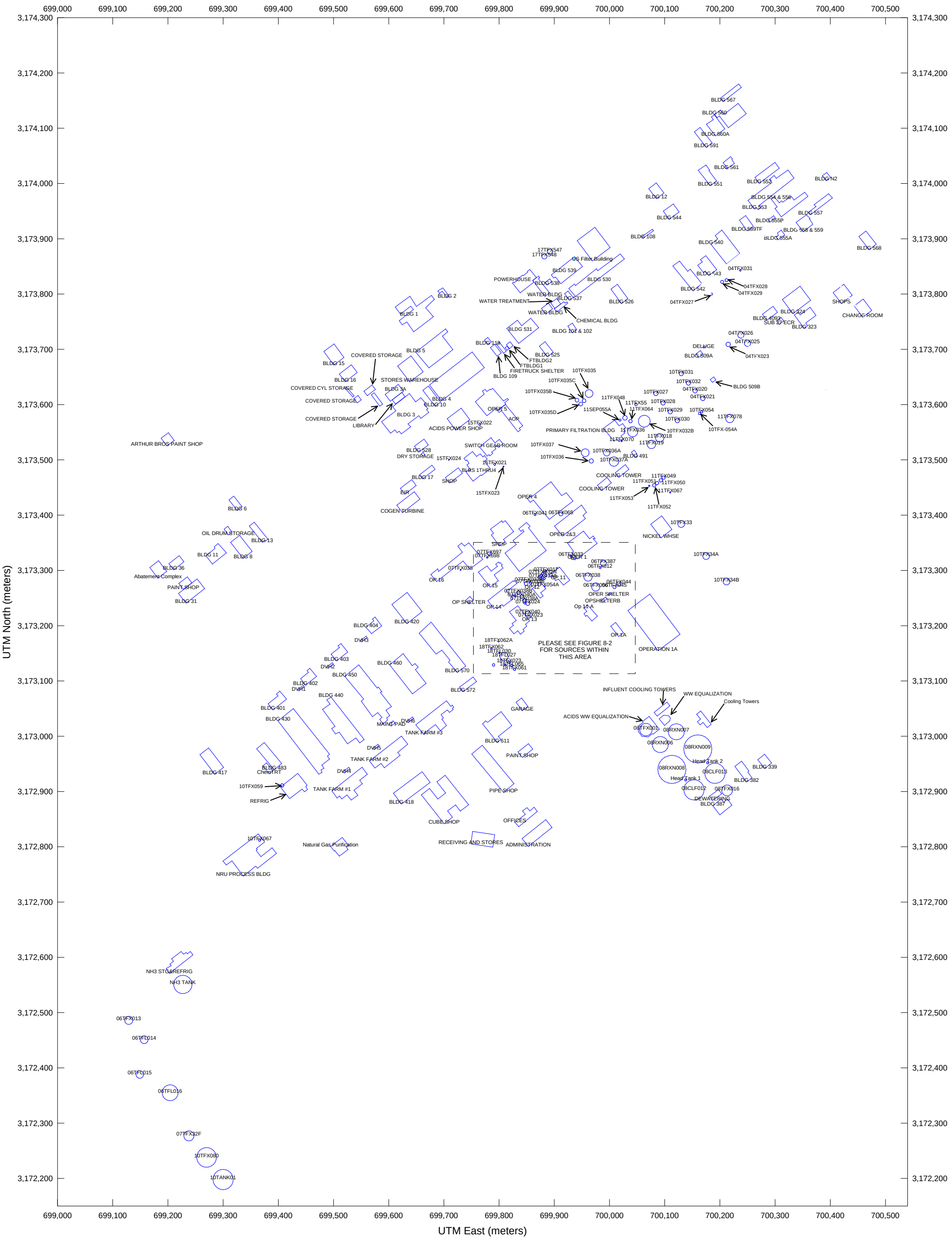
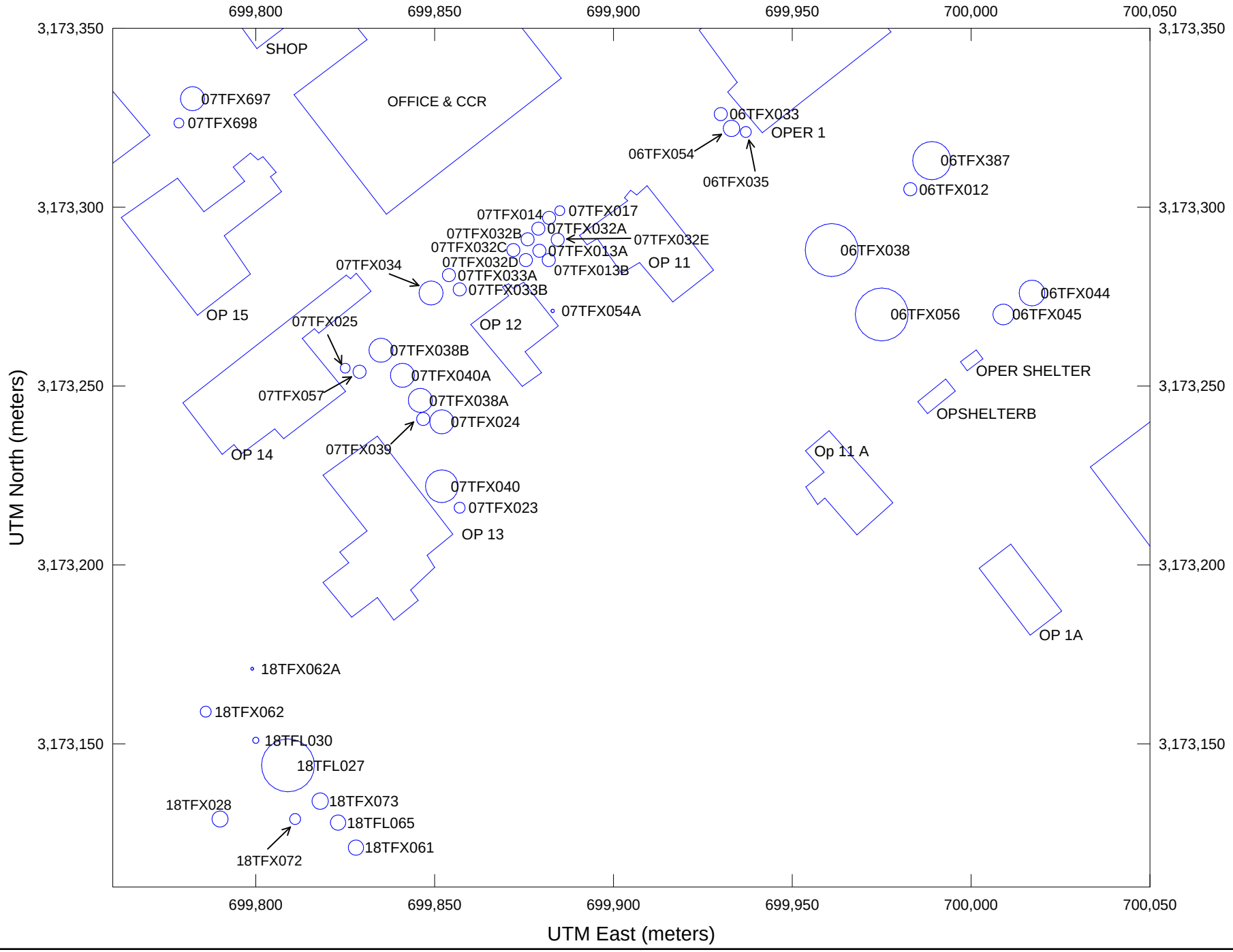


Figure 8-2. Location of Nearby Downwash Structures Considered in the Analysis - Detail



9. RECEPTOR GRIDS

For this Air Quality Analysis, the modeled ground-level concentrations are determined within four main Cartesian receptor grids. These four grids cover the INVISTA Victoria Plant property as well as a region extending at least 5 km beyond the Victoria Plant sources. The grids are defined as follows:

1. The "on-site grid" is a discrete receptor grid with the receptors spaced at 25 m intervals and located inside the INVISTA property line.

2. The "property line grid" is a discrete receptor grid with the receptors spaced at 25 m intervals along the INVISTA property line. Note that the property line grid also includes receptors spaced at 25 m along the roads within the INVISTA property that are accessible by the public.

3. The "fine grid" contains 100-m spaced receptors extending at least 1 km from the project sources, excluding the receptors within the on-site and property line grids.

4. The "medium grid" contains 500-m spaced receptors extending 5 km from the project sources, excluding the receptors within the on-site, property line, and fine grids.

5. The "river receptors" is a subset of the property line receptor grid with the receptors spaced at approximately 25 m intervals along the banks and within the river which flows through the INVISTA property. Included in the river receptors are two receptors associated with a historic bridge (Archeological Site 41VT113), which were analyzed separately.

Figures 9-1 through 9-3 illustrate the receptor locations and elevations for these four receptor grids.

Figure 9-1. Location and Elevations of the Property Line and Onsite Grids

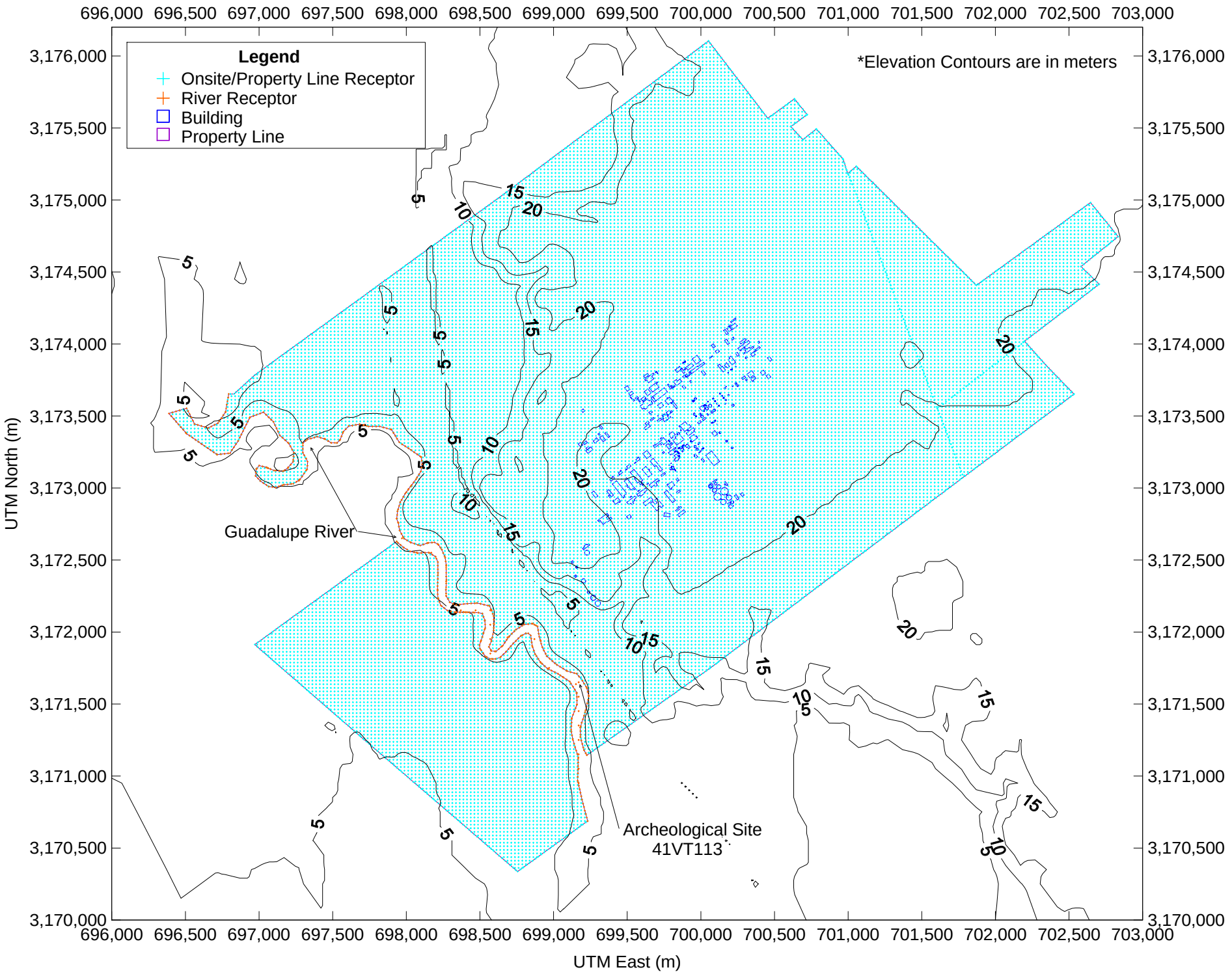


Figure 9-2. Location and Elevations of the Fine Grid Receptors

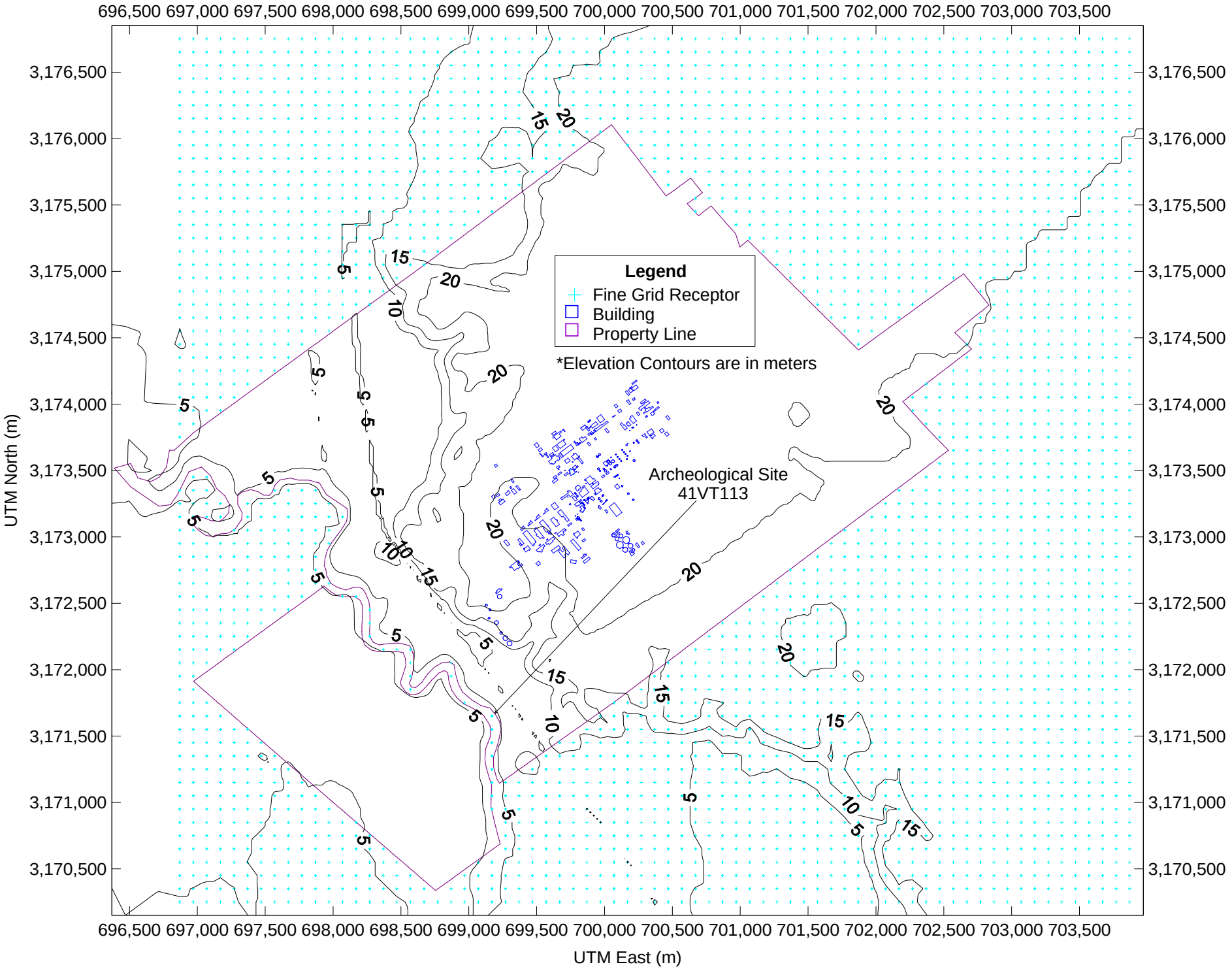
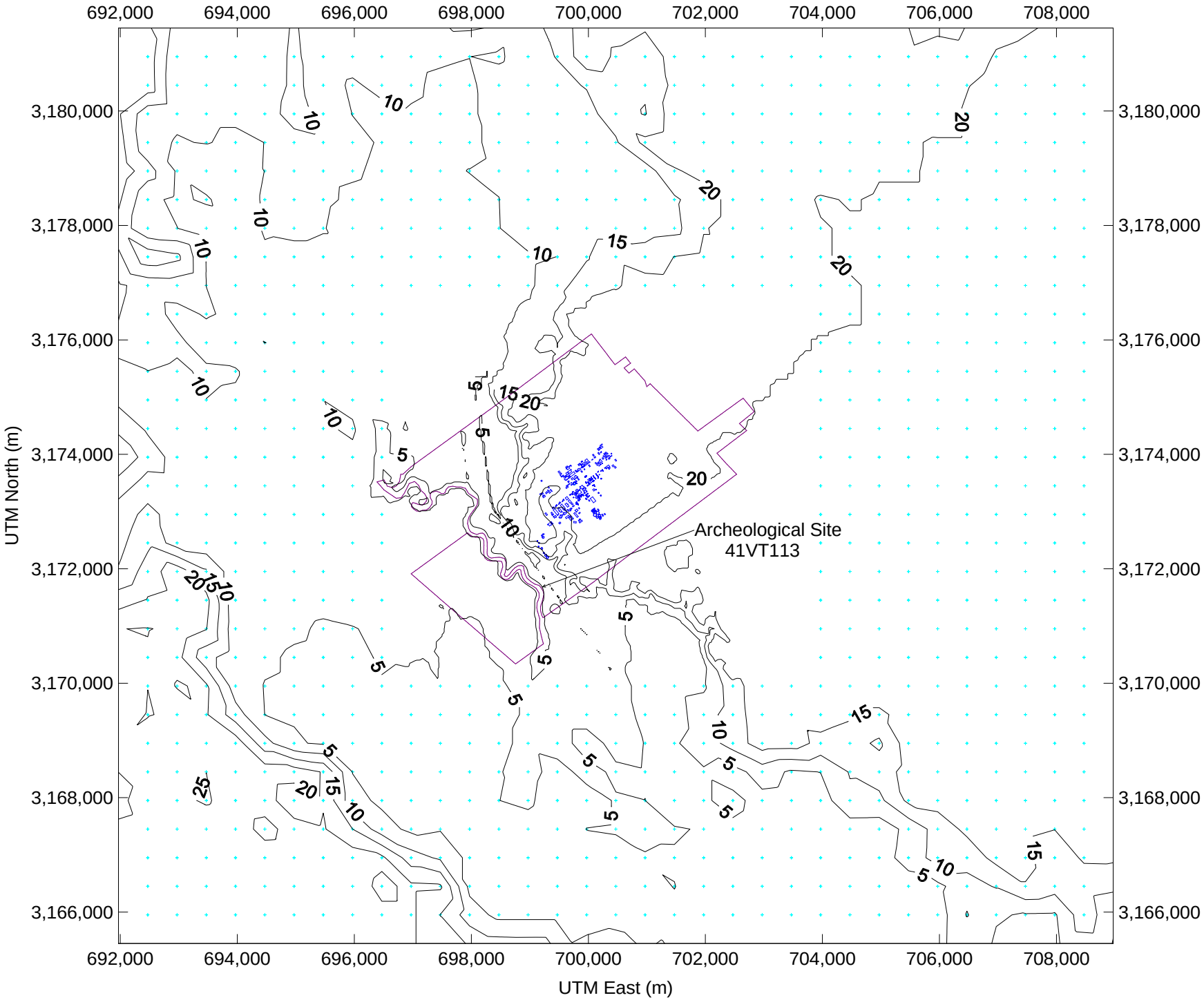


Figure 9-3. Location and Elevations of the Medium Grid Receptors



Legend Medium Grid Receptor | Building | Property Line

*Elevation Contours are in meters

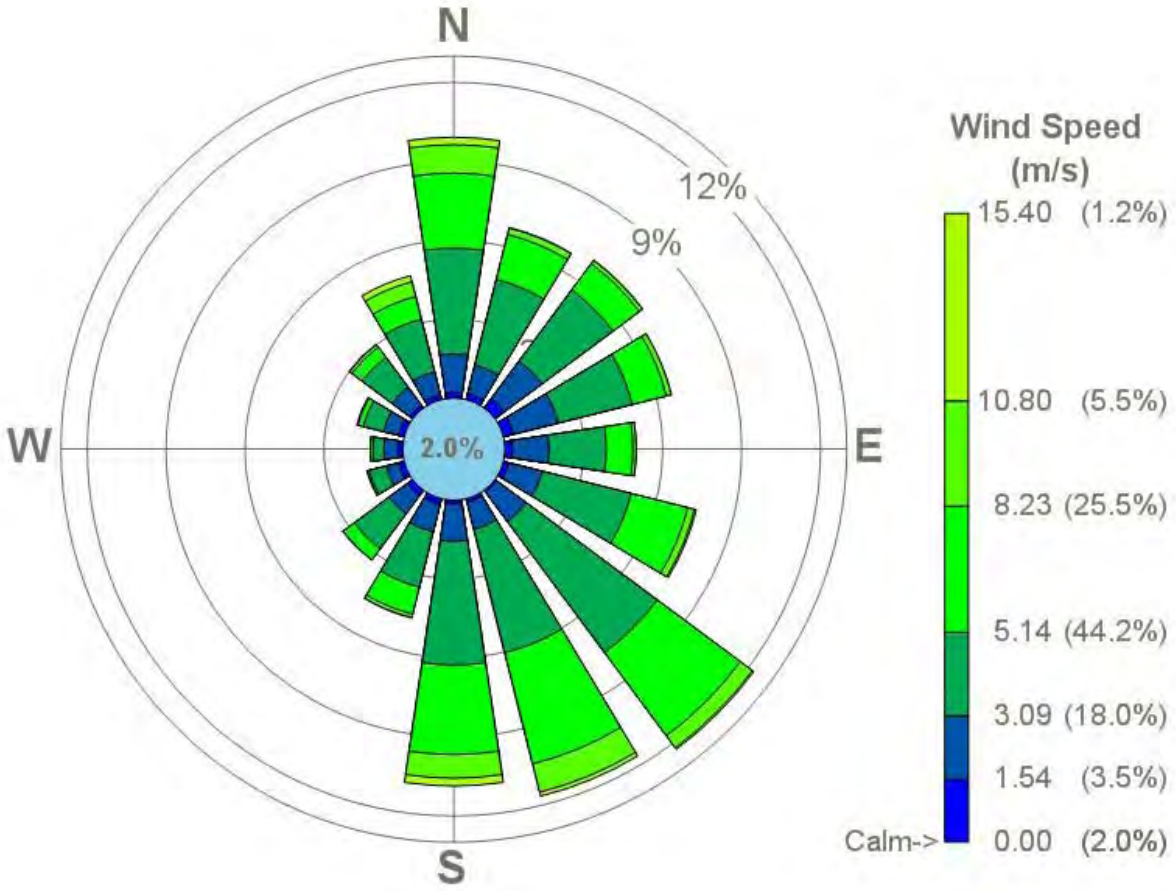
As recommended by the TCEQ for modeling in Victoria County, pre-processed meteorological data files for the year 1988 based on surface and upper air observations taken from Victoria, Texas (NWS station number 12912) were obtained from the TCEQ. The base elevation at the Victoria NWS station during the period of interest was 36 meters. The windrose for Victoria from 1988, provided as Figure 10-1, was used to supplement the meteorological data used in the modeling analysis.

According to the EPA AERMOD Users Guide, a landuse analysis must be conducted to properly define surface characteristics, such as albedo, Bowen ratio, and surface roughness length, for input into the AERMET meteorological pre-processor. The AERMOD Users Guide provides surface characteristic parameters based on seasons and the following landuse characteristics: water (fresh and sea), deciduous forest, coniferous forest, swamp, cultivated land, grassland, urban, and desert shrub land.[7]

Pre-processed meteorological files obtained from the TCEQ allow the choice of varying roughness length (i.e., short, medium, and long) based on the land use surrounding the facility under evaluation. A review of surrounding land use using the U.S. EPA's AERSURFACE tool indicates that the area surrounding the Victoria Plant is predominantly cultivated land, grassland and deciduous forest. Therefore, the TCEQ meteorological file containing medium surface roughness parameters was used in this analysis. The AERSURFACE output data is provided in Appendix C.

[7] Section 4.7.7 of the EPA's *AERMOD User Guide*, Draft Version, January 1999.

FIGURE 10-1. FREQUENCY OF WIND SPEED AND DIRECTION FOR METEOROLOGICAL YEAR 1988



This section summarizes the results of the Air Quality Analysis for the WPH allowable emissions increases at the Victoria Plant.

The proposed increases in allowable emissions from project sources were evaluated to determine if the resulting modeled concentrations exceed the SILs for the criteria pollutants and the ESL for the non-criteria pollutants.[8] The highest modeled concentration (H1H) for each pollutant and each averaging period is presented below. Table 11-1 provides the maximum modeled impacts of the criteria pollutants. Table 11-2 provides the maximum modeled impacts of the non-criteria pollutants.

TABLE 11-1. MAXIMUM MODELED IMPACTS OF THE CRITERIA POLLUTANTS

Pollutant	Averaging period	Type of Receptor	UTM East (m)	UTM North (m)	GLC_{max} Value ($\mu g/m^3$)	SIL ($\mu g/m^3$)	Percent of SIL
CO	1-hr	Offsite	700,835	3,172,346	6.55	2,000	2.50%
		Onsite	699,738	3,173,488	**49.95**		
		River	698,102	3,173,214	5.69		
		Bridge	699,152	3,171,638	4.80		
	8-hr	Offsite	699,238	3,171,561	4.13	500	4.43%
		Onsite	699,738	3,173,488	**22.17**		
		River	699,238	3,171,561	4.13		
		Bridge	699,152	3,171,638	3.65		
SO_2	Annual	Offsite	699,119	3,175,390	0.00281	1	0.80%
		Onsite	699,613	3,174,088	**0.00798**		
		River	699,221	3,171,620	0.00169		
		Bridge	699,470	3,171,151	0.00158		

[1] Concentrations in bold represent maximum predicted concentrations for each pollutant and averaging period.

[8] TCEQ, *Air Quality Modeling Guidelines*, RG-25 (Revised), New Source Review Permits Division, Austin, TX, February 1999.

TABLE 11-2. MAXIMUM MODELED IMPACTS OF THE NON-CRITERIA POLLUTANTS

Pollutant	Averaging period	Type of Receptor	UTM East (m)	UTM North (m)	GLC_{max} Value ($\mu g/m^3$)	ESL ($\mu g/m^3$)	Percent of ESL
NH_3	1-hr	Offsite	700,835	3,172,346	1.00	170	1.64%
		Onsite	699,488	3,173,788	**2.79**		
		River	698,102	3,173,214	0.87		
		Bridge	699,152	3,171,638	0.73		
	Annual	Offsite	699,079	3,175,359	0.04	17	0.76%
		Onsite	699,613	3,174,088	**0.13**		
		River	699,226	3,171,610	0.03		
		Bridge	699,238	3,171,388	0.03		
N_2O	1-hr	Offsite	700,835	3,172,346	8.89	4,500	2.88%
		Onsite	699,738	3,173,488	**129.72**		
		River	698,102	3,173,214	7.75		
		Bridge	699,152	3,171,638	6.53		
	Annual	Offsite	699,079	3,175,359	0.18	450	1.51%
		Onsite	699,738	3,173,513	**6.78**		
		River	699,226	3,171,610	0.11		
		Bridge	698,738	3,172,338	0.10		

[1] Concentrations in bold represent maximum predicted concentrations for each pollutant and averaging period.

As provided in the tables above, the maximum modeled concentrations of CO and SO_2 are significantly below their corresponding SILs and the maximum modeled concentrations of NH_3 and N_2O are significantly below their corresponding ESLs.

APPENDIX A: SOURCE PARAMETERS AND EMISSION RATES

Table A-1. Modeled Project Point Source Location and Parameters

Source ID	EPN	Description	UTM E	UTM N	Stack Height		Stack Temperature		Stack Exit Velocity		Stack Exit Diameter	
			(m)	(m)	(ft)	(m)	(F)	(K)	(ft/s)	(m/s)	(ft)	(m)
15STK05	15STK05	Boiler 1 & 2 Stack	699748	3173504	150.00	45.72	400	477.59	47.00	14.33	12.3	3.75
15STK06	15STK06	Boiler 3 & 4 Stack	699772	3173473	150.00	45.72	400	477.59	51.00	15.54	13.7	4.18

Table A-2. Modeled Project Volume Source Location and Parameters

Source ID	EPN	Description	UTM East	UTM North	Release Height		Initial Vertical Dimension		Initial Vertical Dimension	
			(m)	(m)	(ft)	(m)	(ft)	(m)	(ft)	(m)
15FUG	15FUG	APH Fugitives	699759	3173489	31.50	9.60	28.61	8.72	26.51	8.08

Table A-3. Detailed Volume Source Calculation

Parameter	Source ID
	15FUG
Building Height [ft]	60
Building Length (approx.) [ft]	123
Building Width (approx.) [ft]	123
Ratio (No. Vol Sources)	1
H_{min} [ft]	3
D [ft]	57
Release Height [m]	9.6
Sigma Y [m][2]	8.72
Sigma Z [m][3]	8.08

Table A-4. Maximum Modeled Short Term Criteria Pollutant Emission Increases

Type of Source	EPN	Model ID	CO	
			1- hour and 8- hour Averaging Period	
			(lb/hr)	(g/s)
Point	15STK05	15STK05	29.90	3.768
Point	15STK06	15STK06	39.72	5.004
Volume	15FUG	15FUG	0.21	0.02604

Table A-5. Maximum Modeled Annual Criteria Pollutant Emission Increases

Type of Source	EPN	Model ID	SO_2	
			Annual Averaging Period	
			(tpy)	(g/s)
Point	15STK05	15STK05	1.47	0.04216
Point	15STK06	15STK06	1.31	0.03769
Volume	15FUG	15FUG	0	0.00000

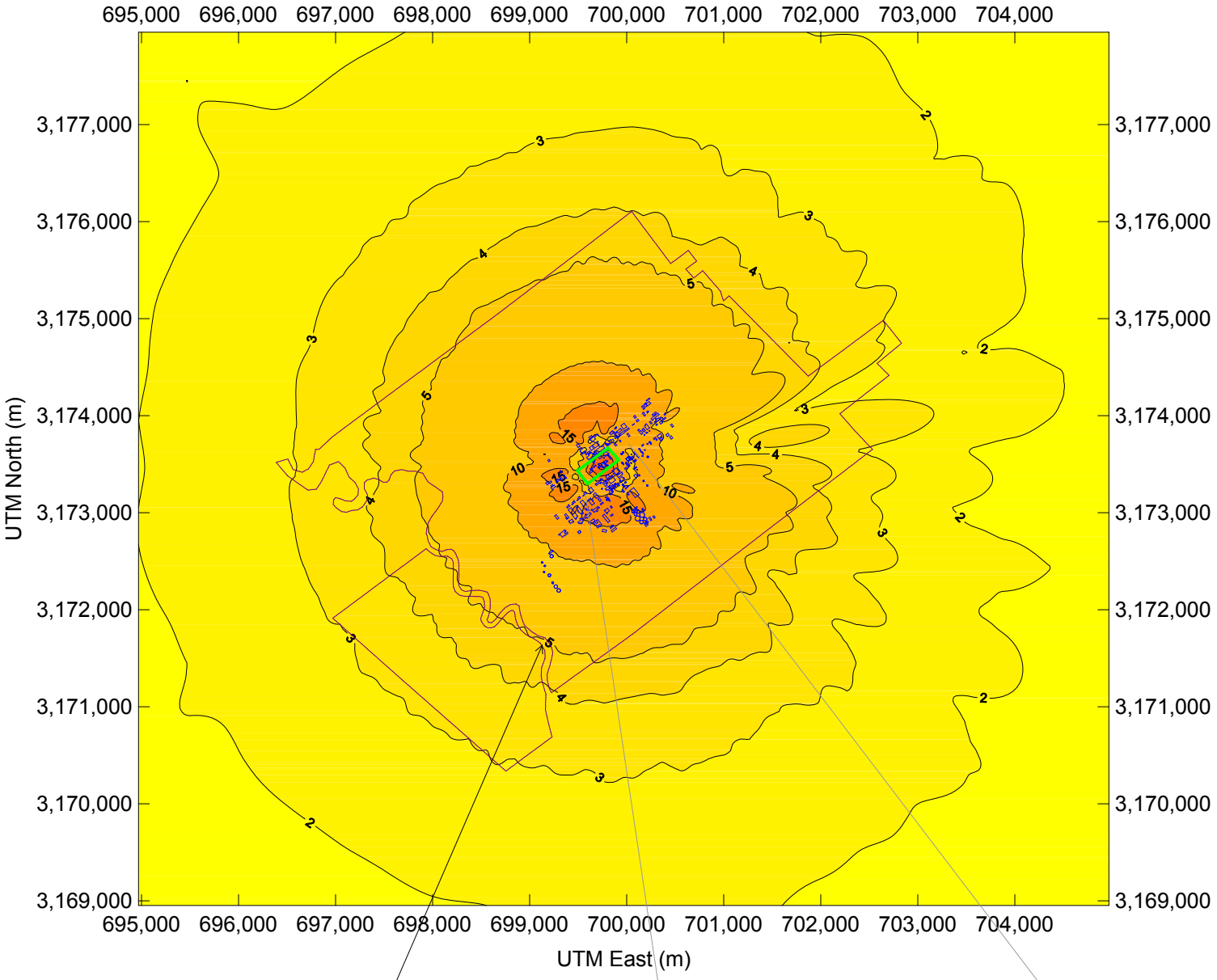
Table A-6. Maximum Modeled Short Term Non-Criteria Pollutant Emission Increases

Model ID	N_2O		NH_3	
	1- hour Averaging Period		1- hour Averaging Period	
	(lb/hr)	(g/s)	(lb/hr)	(g/s)
15STK05	46.28	5.831	4.60	0.5799
15STK06	47.67	6.006	6.04	0.7604
15FUG	0.54	0.06762	0.00	0.00

Table A-7. Maximum Modeled Annual Non-Criteria Pollutant Emission Increases

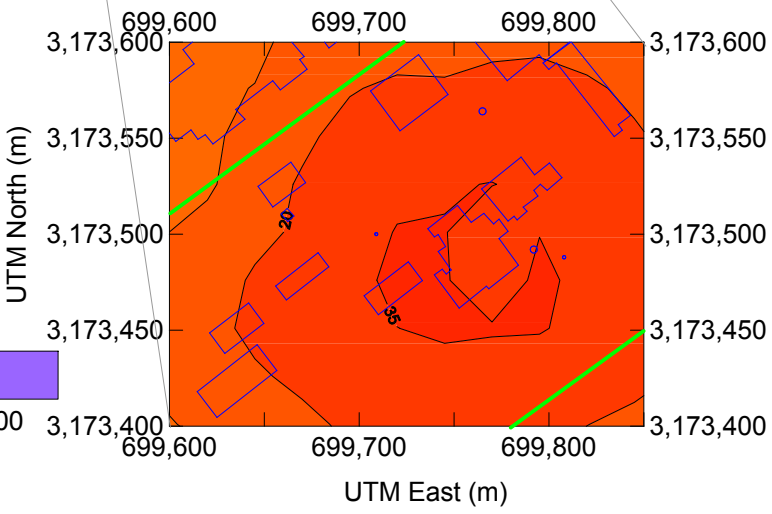
Model ID	N_2O		NH_3	
	Annual Averaging Period		Annual Averaging Period	
	(tpy)	(g/s)	(tpy)	(g/s)
15STK05	68.28	1.964	19.03	0.5473
15STK06	98.08	2.821	26.17	0.7528
15FUG	2.37	0.06809	0	0

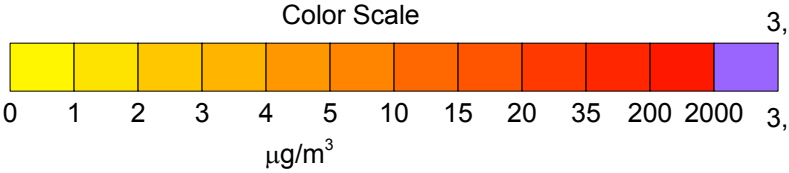
Carbon Monoxide 1-hr Concentration Plot



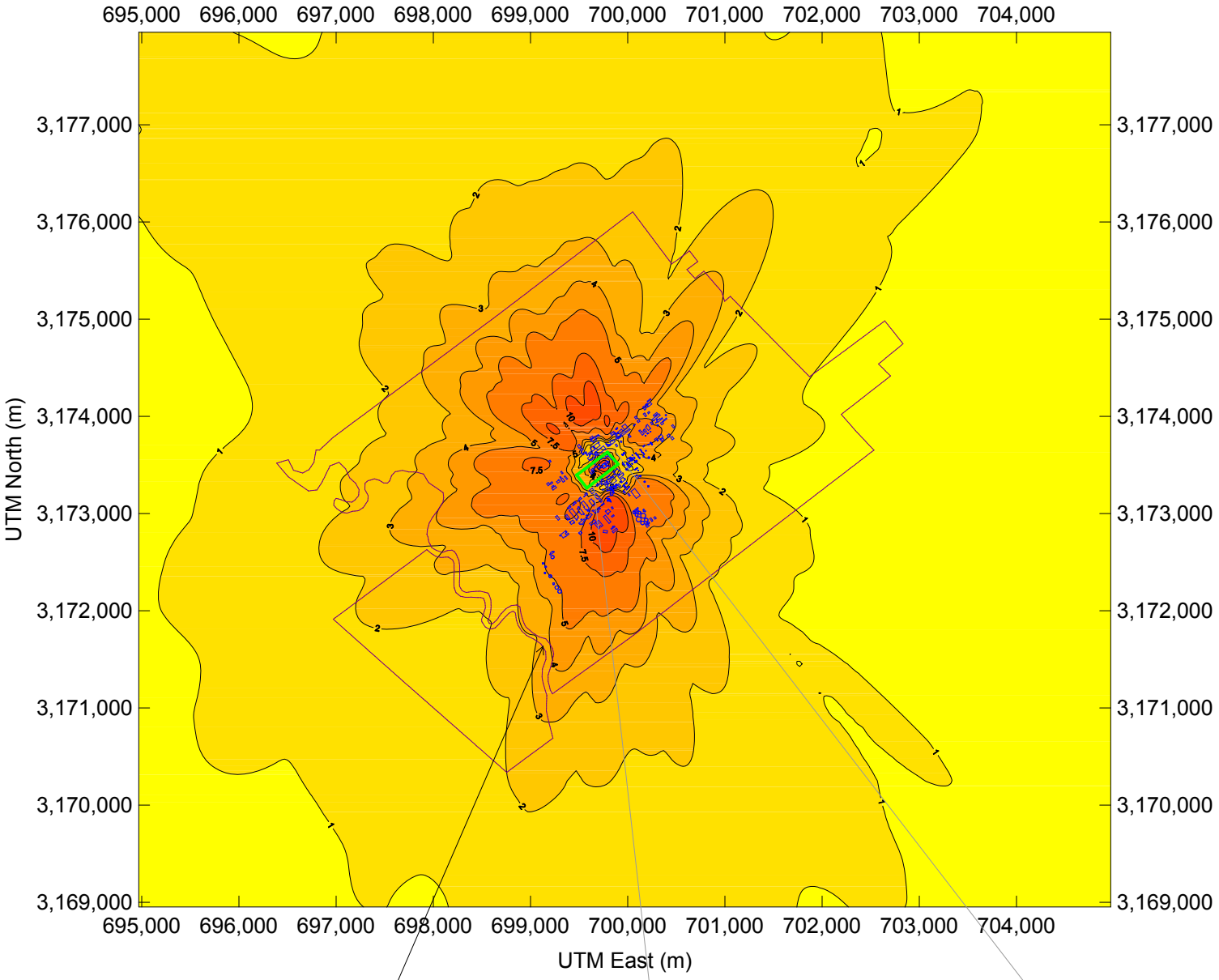
Concentration at Historic Landmark : 4.8 μg/m^3

Max Concentration : 49.95 μg/m^3
(SIL = 2,000 μg/m^3)



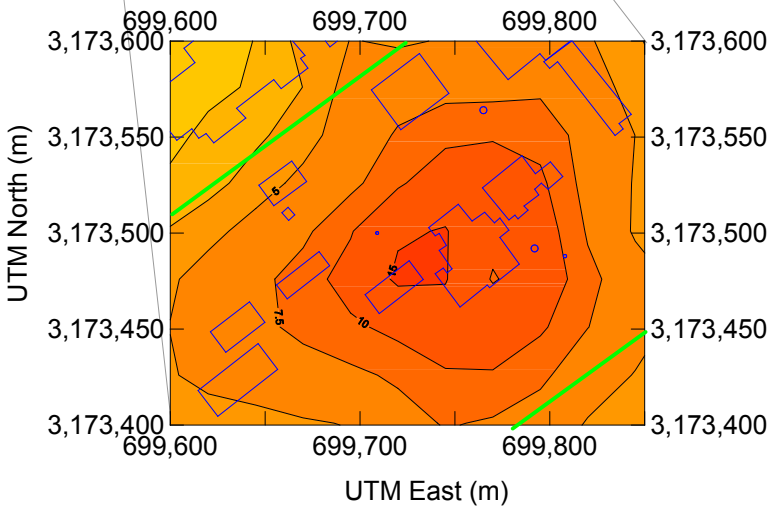


Carbon Monoxide 8-hr Concentration Plot

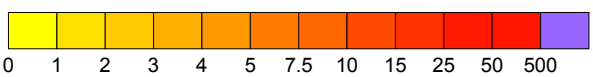


Concentration at Historic Landmark : 3.65 μg/m^3

Max Concentration : 22.17 μg/m^3
(SIL = 500 μg/m^3)

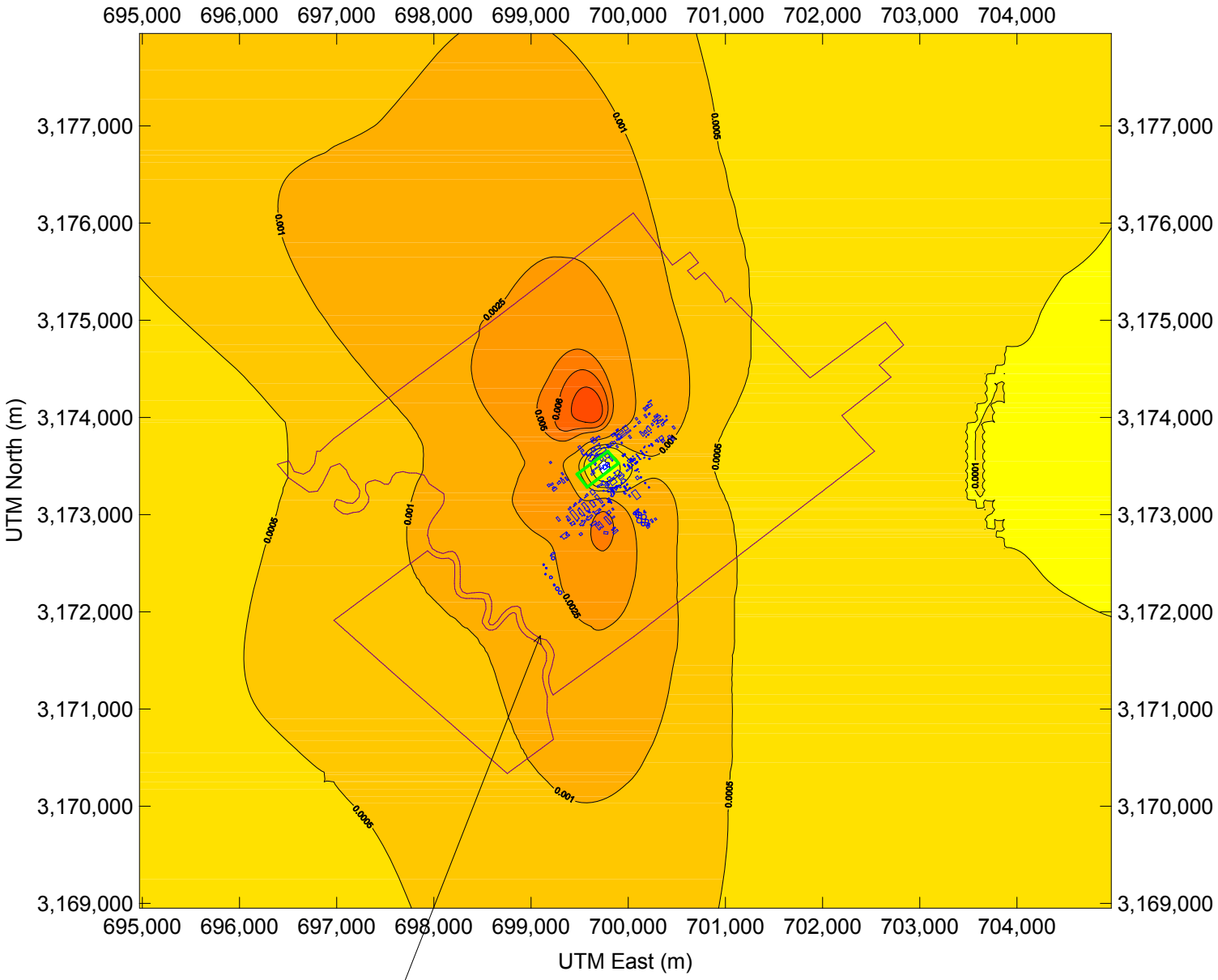


Color Scale



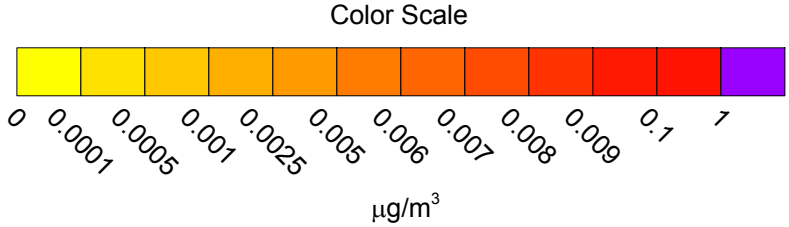
μg/m^3

Sulfur Dioxide Annual Concentration Plot

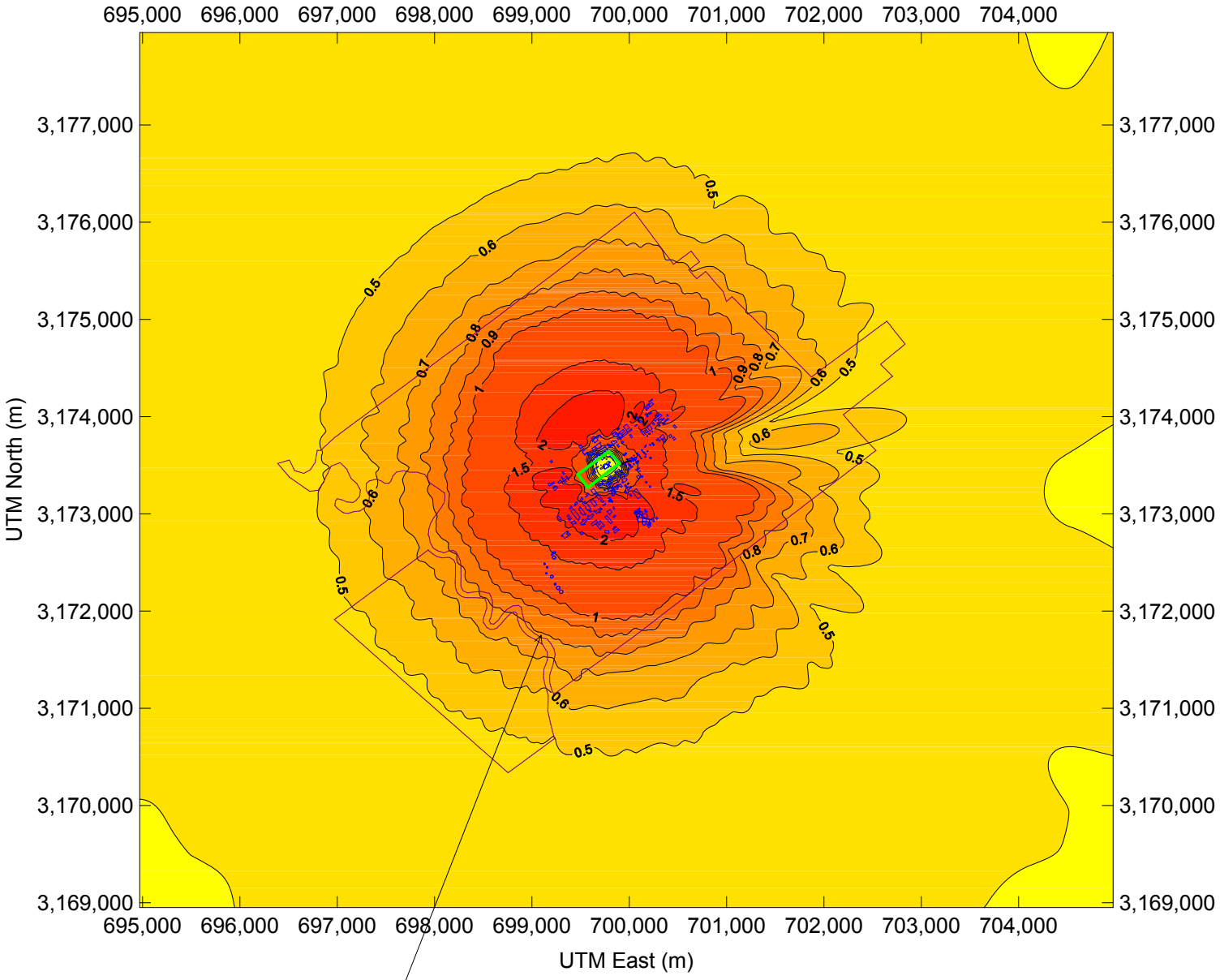


Concentration at Historic Landmark : 0.0016 μg/m^3

Max Concentration : 0.008 μg/m^3
(SIL = 1 μg/m^3)



Ammonia 1-Hour Concentration Plot



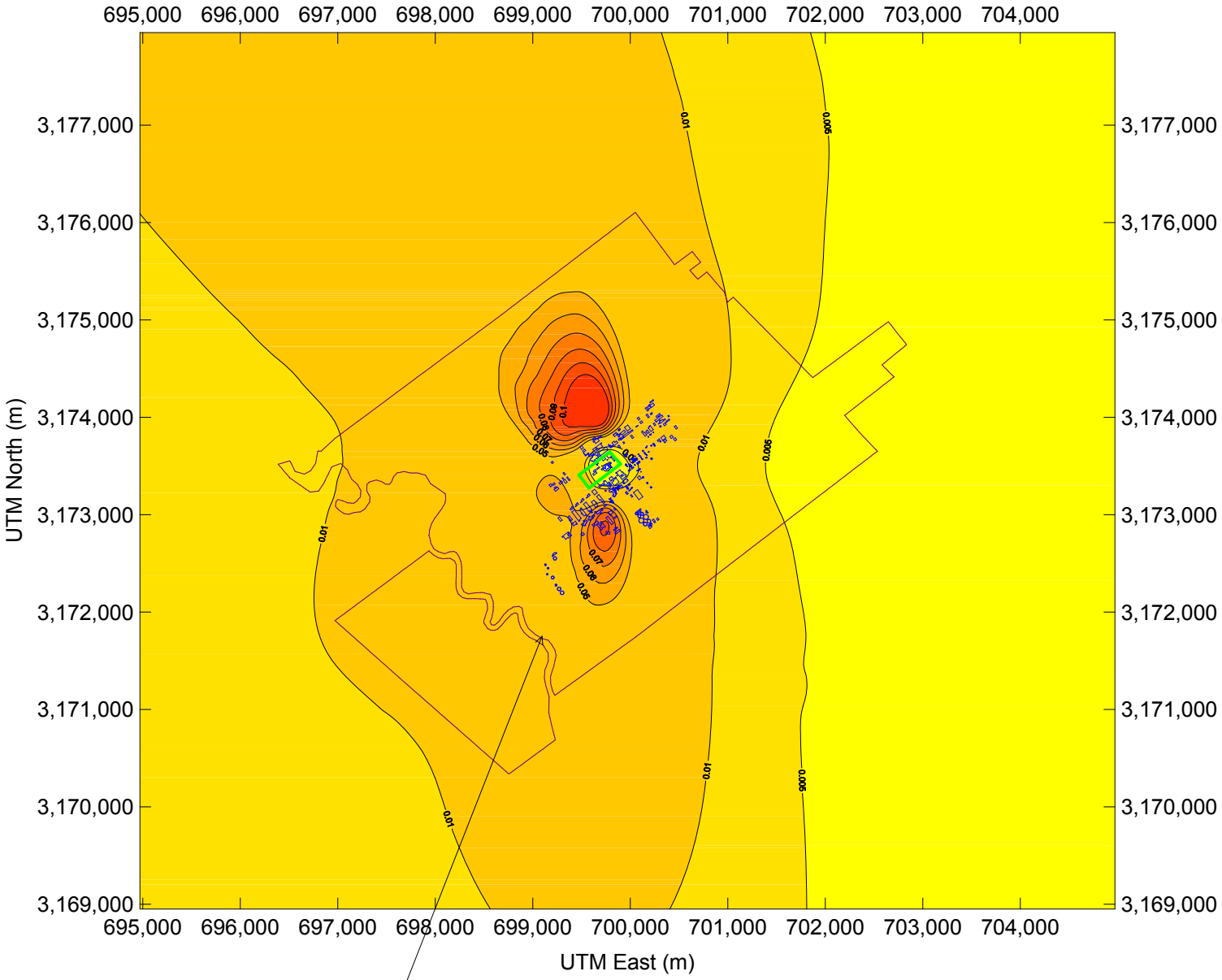
Concentration at Historic Landmark : 0.73 μg/m^3

Max Concentration : 2.79 μg/m^3
ESL = 170 μg/m^3

Color Scale

μg/m^3

Ammonia Annual Concentration Plot



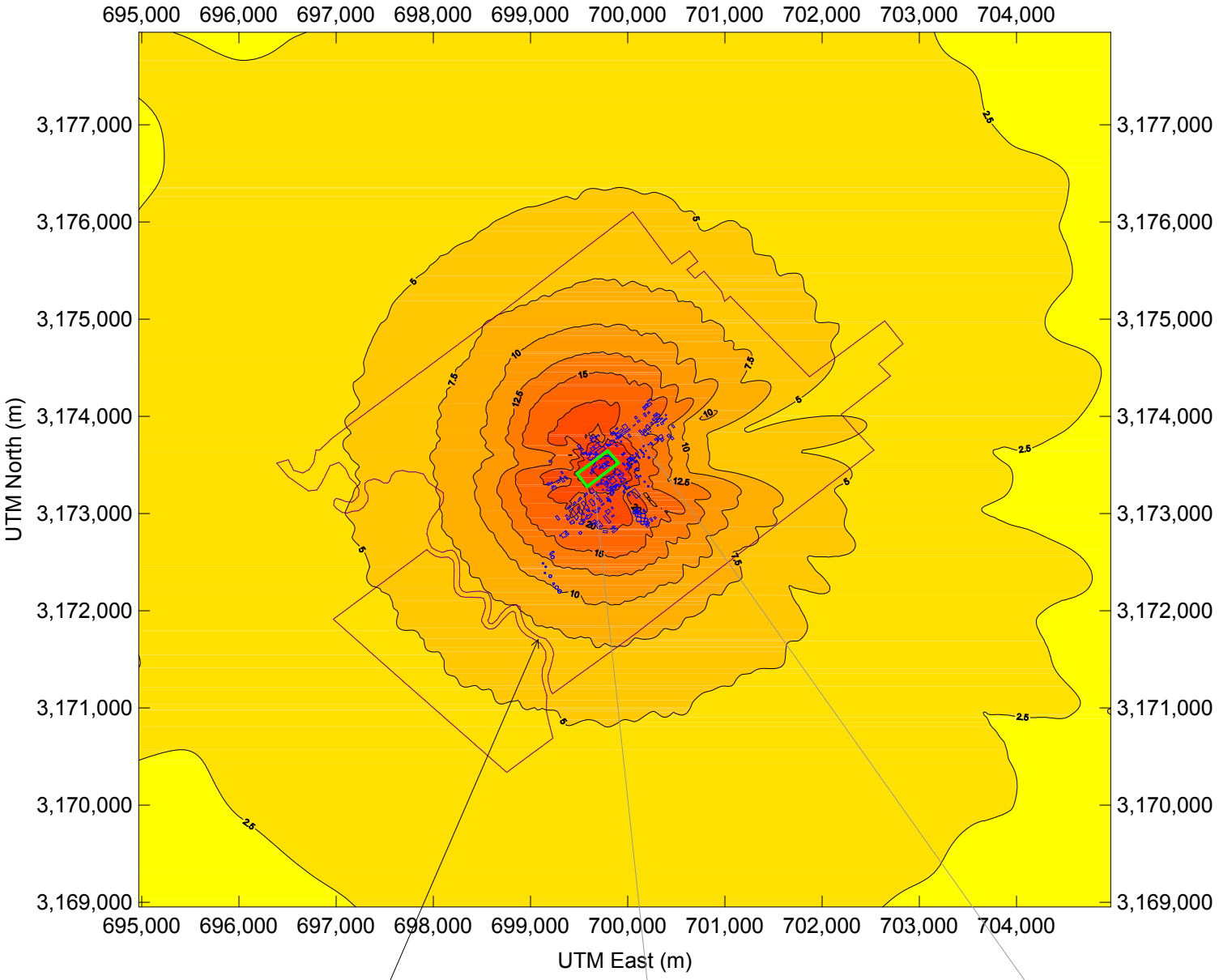
Concentration at Historic Landmark : 0.025 μg/m^3

Max Concentration : 0.13 μg/m^3
ESL = 17 μg/m^3

Color Scale

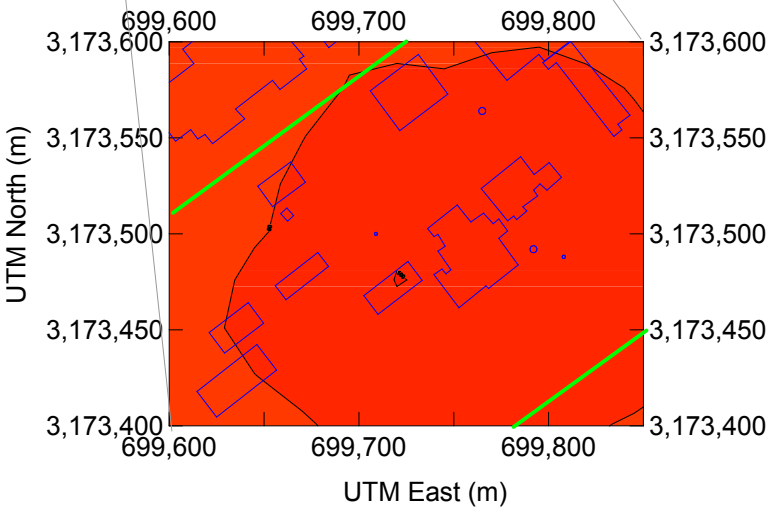
μg/m^3

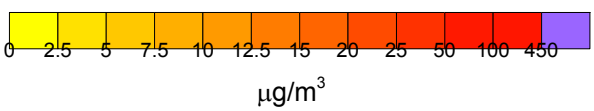
Nitrous Oxide 1-hr Concentration Plot



Concentration at Historic Landmark : 6.53 μg/m^3

Max Concentration : 129.72 μg/m^3
ESL = 4,500 μg/m^3





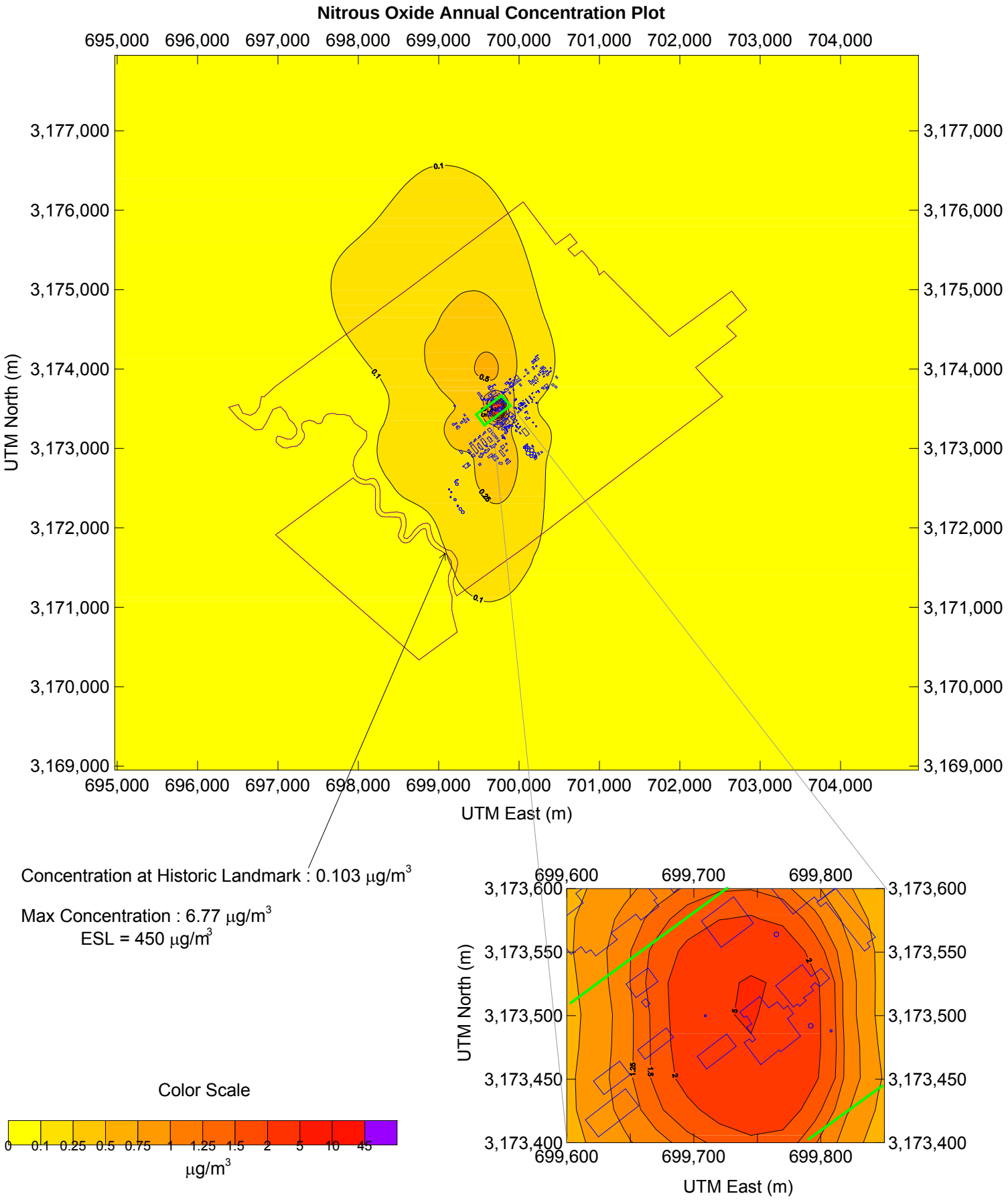

Nitrous Oxide Annual Concentration Plot
695,000
696,000
697,000
698,000
699,000
700,000
701,000
702,000
703,000
704,000
3,177,000
3,176,000
3,175,000
3,174,000
3,173,000
3,172,000
3,171,000
3,170,000
3,169,000
UTM North (m)
UTM East (m)
0.1
0.5
0.25
Concentration at Historic Landmark : 0.103 µg/m3
Max Concentration : 6.77 µg/m3
ESL = 450 µg/m3
699,600
699,700
699,800
3,173,600
3,173,550
3,173,500
3,173,450
3,173,400
2
5
1.25
1.5
2
Color Scale
0 0.1 0.25 0.5 0.75 1 1.25 1.5 2 5 10 45
µg/m3

TABLE C-1. DESCRIPTION AND HEIGHT OF BUILDINGS IN DOWNWASH ANALYSIS

Building ID	Description	Height (m)	Height (ft)
BLD1	04TFX020	7.01	23.00
BLD2	Natural Gas Purification	9.27	30.41
BLD3	BLDG 483	5.18	16.99
BLD4	BLDG 11	7.28	23.88
BLD5	ChemTRT	5.18	16.99
BLD6	04TFX021	7.01	23.00
BLD7	DVH1	11.77	38.62
BLD8	DVH2	5.18	16.99
BLD9	DVH3	5.09	16.70
BLD10	DVH4	5.52	18.11
BLD11	04TFX025	7.01	23.00
BLD12	DVH5	5.18	16.99
BLD13	04TFX026	7.01	23.00
BLD14	MAINT PAD	5.91	19.39
BLD15	04TFX027	7.01	23.00
BLD16	BLDG 1	4.27	14.01
BLD17	DVH6	4.57	14.99
BLD18	TANK FARM #3	12.5	41.01
BLD19	TANK FARM #2	12.31	40.39
BLD20	BLDG 531	5.43	17.81
BLD21	TANK FARM #1	15.36	50.39
BLD22	CUBE SHOP	9.6	31.50
BLD23	OP 15	14.02	46.00
BLD24	OP 14	20.97	68.80
BLD25	BLDG 530	4.39	14.40
BLD26	BLDG 539	16.37	53.71
BLD27	OPSHELTERB	5.03	16.50
BLD28	OPER SHELTER	5.79	19.00
BLD29	INFLUENT COOLING TOWERS	5.79	19.00
BLD30	04TFX028	7.01	23.00
BLD31	Abatement Complex	2.44	8.01
BLD32	BLDG 36	4.45	14.60
BLD33	BLDG 8	6.61	21.69
BLD34	04TFX029	7.01	23.00
BLD35	BLDG 6	5.88	19.29
BLD36	BLDG 15	5.09	16.70
BLD37	BLDG 16	5.18	16.99
BLD38	BLDG 10	5.18	16.99

TABLE C-2. DESCRIPTION AND HEIGHT OF BUILDINGS IN DOWNWASH ANALYSIS (CONTINUED)

Building ID	Description	Height (m)	Height (ft)
BLD39	BLDG 4	11.77	38.62
BLD40	BLDG 2	2.8	9.19
BLD41	WW EQUALIZATION	9.24	30.31
BLD42	BLDG 109	5.18	16.99
BLD43	BLDG 119	5.09	16.70
BLD44	BLDG 525	5.52	18.11
BLD45	BLDG 101 & 102	5.18	16.99
BLD46	BLDG 537	5.91	19.39
BLD47	BLDG 538	4.57	14.99
BLD48	BLDG 526	5.03	16.50
BLD49	ACIDS WW EQUALIZATION	15.03	49.31
BLD50	BLDG 12	5.79	19.00
BLD51	BLDG 544	5.79	19.00
BLD52	BLDG 551	6.71	22.01
BLD53	BLDG 561	19.81	64.99
BLD54	BLDG 591	5.49	18.01
BLD55	COOLING TOWERS	5.52	18.11
BLD56	BLDG 560A	7.62	25.00
BLD57	BLDG 560	5.49	18.01
BLD58	BLDG 567	4.27	14.01
BLD59	BLDG 420	5.12	16.80
BLD60	BLDG 570	4.21	13.81
BLD61	BLDG 404	7.38	24.21
BLD62	BLDG 460	22.86	75.00
BLD63	BLDG 403	7.38	24.21
BLD64	BLDG 450	19.66	64.50
BLD65	BLDG 402	7.28	23.88
BLD66	BLDG 440	32.77	107.51
BLD67	BLDG 401	7.28	23.88
BLD68	BLDG 430	38.28	125.59
BLD69	REGRIG	14.05	46.10
BLD70	BLDG 418	6.74	22.11
BLD71	COOLING TOWER	5.49	18.01
BLD72	COOLING TOWER	4.27	14.01
BLD73	PIPE SHOP	8.23	27.00
BLD74	OFFICES	3.57	11.71
BLD75	ADMINISTRATION	4.72	15.49
BLD76	RECEIVING AND STORES	6.4	21.00

TABLE C-3. DESCRIPTION AND HEIGHT OF BUILDINGS IN DOWNWASH ANALYSIS (CONTINUED)

Building ID	Description	Height (m)	Height (ft)
BLD77	PAINT SHOP	5.79	19.00
BLD78	BLDG 611	4.57	14.99
BLD79	BLDG 552	6.71	22.01
BLD80	BLDG 491	4.15	13.62
BLD81	SWITCH GEAR ROOM	5.43	17.81
BLD82	BLDG 324	7.04	23.10
BLD83	DRY STORAGE	5.12	16.80
BLD84	BLDG 323	7.53	24.70
BLD85	SHOPS	6.1	20.01
BLD86	CHANGE ROOM	4.57	14.99
BLD87	BLDG 568	5.49	18.01
BLD88	OPER 4	27.22	89.30
BLD89	OPER 2&3	25.36	83.20
BLD90	OPER 1	44.78	146.92
BLD91	BLDG 3A	6.74	22.11
BLD92	BLDG 3	4.45	14.60
BLD93	LIBRARY	8.23	27.00
BLD94	OFFICE & CCR	7.07	23.20
BLD95	COVERED STORAGE	4.72	15.49
BLD96	COVERED DRUM STORAGE	6.4	21.00
BLD97	COVERED STORAGE	5.79	19.00
BLD98	COVERED CYL STORAGE	6.71	22.01
BLD99	OP 16	27.61	90.58
BLD100	OP SHELTER	3.9	12.80
BLD101	BLDG 572	3.96	12.99
BLD102	08TFX001	12.43	40.78
BLD103	08RXN006	9.75	31.99
BLD104	BLDG 5	9.42	30.91
BLD105	08RXN008	9.75	31.99
BLD106	08CLF012	5.49	18.01
BLD107	08RXN007	9.75	31.99
BLD108	STORES WAREHOUSE	7.04	23.10
BLD109	08RXN009	9.75	31.99
BLD110	FIRETRUCK SHELTER	6.1	20.01
BLD111	08CLF013	5.49	18.01
BLD112	FTBLDG1	4.57	14.99
BLD113	08TFX016	8.53	27.99
BLD114	DEWATERING	7.19	23.59

TABLE C-4. DESCRIPTION AND HEIGHT OF BUILDINGS IN DOWNWASH ANALYSIS (CONTINUED)

Building ID	Description	Height (m)	Height (ft)
BLD115	BLDG 387	15.24	50.00
BLD116	BLDG 382	7.44	24.41
BLD117	BLDG 339	5.61	18.41
BLD118	BLDG 417	4.57	14.99
BLD119	NH3 TANK	33.53	110.01
BLD120	NH3 STG&REFRIG	10.67	35.01
BLD121	06TFX013	11.28	37.01
BLD122	06TFL014	11.28	37.01
BLD123	FTBLDG2	5.49	18.01
BLD124	06TFL015	11.28	37.01
BLD125	06TFL016	11.28	37.01
BLD126	10TFX080	14.63	48.00
BLD127	CHEMICAL BLDG	4.15	13.62
BLD128	10TANK01	8.78	28.81
BLD129	07TFX32F	8.78	28.81
BLD130	COGEN TURBINE	19.51	64.01
BLD131	EIR	6.49	21.29
BLD132	WATER TREATMENT	3.9	12.80
BLD133	SHOP	7.62	25.00
BLD134	BLDG 17	9.63	31.59
BLD135	BLRS 1THRU4	18.29	60.01
BLD136	OPER 5	22.4	73.49
BLD137	SHOP	7.62	25.00
BLD138	04TFX031	7.01	23.00
BLD139	WATER BLDG	3.96	12.99
BLD140	WATER BLDG	5.09	16.70
BLD141	OP 13	18.84	61.81
BLD142	OP 12	16.64	54.59
BLD143	OP 11	16.25	53.31
BLD144	OP 1A	4.79	15.72
BLD145	17TFX547	9.14	29.99
BLD146	OPERATION 1A	16.76	54.99
BLD147	06TFX012	6.1	20.01
BLD148	NICKEL WHSE	6.1	20.01
BLD149	POWERHOUSE	18.35	60.20
BLD150	PRIMARY FILTRATION BLDG	14.51	47.60
BLD151	BLDG 509B	10.06	33.01
BLD153	BLDG 509A	8.23	27.00

TABLE C-5. DESCRIPTION AND HEIGHT OF BUILDINGS IN DOWNWASH ANALYSIS (CONTINUED)

Building ID	Description	Height (m)	Height (ft)
BLD154	04TFX023	6.1	20.01
BLD155	BLDG 542	15.2	50.00
BLD156	BLDG 543	6.71	22.01
BLD157	DELUGE	5.61	18.41
BLD158	SUB 27 ECR	4.57	14.99
BLD159	ARTHUR BROS PAINT SHOP	4.57	14.99
BLD160	BLDG 4093	9.57	31.40
BLD161	GARAGE	6.1	20.01
BLD162	BLDG 528	15.88	52.10
BLD163	AOP	22.4	73.49
BLD164	ACIDS POWER SHOP	2.44	8.01
BLD165	BLDG 540	24.44	80.18
BLD166	BLDG 108	4.45	14.60
BLD167	BLDG 553	13.72	45.01
BLD168	BLDG 554 & 556	6.1	20.01
BLD169	BLDG N2	6.61	21.69
BLD170	BLDG 558 & 559	27.43	89.99
BLD171	BLDG 557	6.1	20.01
BLD172	BLDG 589TF	5.88	19.29
BLD173	BLDG 555A	5.49	18.01
BLD174	BLDG 555B	5.09	16.70
BLD175	BLDG 31	19.51	64.01
BLD176	PAINT SHOP	6.49	21.29
BLD177	OIL DRUM STORAGE	7.62	25.00
BLD178	BLDG 13	4.45	14.60
BLD179	NRU PROCESS BLDG	38.28	125.59
BLD180	06TFX033	6.1	20.01
BLD181	06TFX035	4.27	14.01
BLD182	06TFX038	11.28	37.01
BLD183	06TFX041	6.1	20.01
BLD184	06TFX044	9.75	31.99
BLD185	06TFX045	7.32	24.02
BLD186	06TFX054	6.1	20.01
BLD187	06TFX056	11.28	37.01
BLD188	06TFX065	6.1	20.01
BLD189	10TFX027	7.32	24.02
BLD190	10TFX028	7.32	24.02
BLD191	10TFX029	7.32	24.02

TABLE C-6. DESCRIPTION AND HEIGHT OF BUILDINGS IN DOWNWASH ANALYSIS (CONTINUED)

Building ID	Description	Height (m)	Height (ft)
BLD192	10TFX030	7.32	24.02
BLD193	10TFX031	6.1	20.01
BLD194	10TFX032	6.1	20.01
BLD195	10TFX035	6.1	20.01
BLD196	10TFX035B	9.14	29.99
BLD197	10TFX035C	9.14	29.99
BLD198	10TFX035D	9.14	29.99
BLD199	10TFX036	6.1	20.01
BLD200	10TFX036A	12.19	39.99
BLD201	10TFX037	6.1	20.01
BLD202	10TFX037A	17.07	56.00
BLD203	10TFX054	8.84	29.00
BLD204	10TFX059	7.62	25.00
BLD205	10TFX067	7.62	25.00
BLD206	10TFX33	10.98	36.02
BLD207	10TFX34A	10.98	36.02
BLD208	10TFX34B	10.98	36.02
BLD209	11TFX036	7.62	25.00
BLD210	11TFX019	9.76	32.02
BLD211	11TFX018	9.76	32.02
BLD212	11TFX078	9.97	32.71
BLD213	11TFX55	4.27	14.01
BLD214	11TFX064	2.74	8.99
BLD215	11TFX048	7.62	25.00
BLD216	11SEP055A	1.83	6.00
BLD217	11TFX070	1.22	4.00
BLD218	1TFX067	12.43	40.78
BLD219	11TFX053	9.75	31.99
BLD220	Head Tank 1	11.28	37.01
BLD221	11TFX052	9.75	31.99
BLD222	11TFX051	5.49	18.01
BLD223	11TFX050	9.75	31.99
BLD224	11TFX049	9.75	31.99
BLD225	15TFX021	5.49	18.01
BLD226	15TFX023	8.53	27.99
BLD227	Head Tank 2	11.28	37.01
BLD228	15TFX022	33.53	110.01
BLD229	15TFX024	11.28	37.01

TABLE C-7. DESCRIPTION AND HEIGHT OF BUILDINGS IN DOWNWASH ANALYSIS (CONTINUED)

Building ID	Description	Height (m)	Height (ft)
BLD230	18TFX028	11.28	37.01
BLD231	18TFX062	14.63	48.00
BLD232	18TFX062A	8.78	28.81
BLD233	18TFL030	8.78	28.81
BLD234	18TFL027	7.01	23.00
BLD235	18TFX072	7.01	23.00
BLD236	10TFX-054A	7.32	24.02
BLD237	18TFX073	7.01	23.00
BLD238	18TFL065	7.01	23.00
BLD239	18TFX061	7.01	23.00
BLD240	07TFX023	7.01	23.00
BLD241	07TFX040	7.01	23.00
BLD242	07TFX025	7.01	23.00
BLD243	07TFX057	6.1	20.01
BLD244	07TFX038B	6.1	20.01
BLD245	07TFX040A	4.27	14.01
BLD246	07TFX038A	11.28	37.01
BLD247	97TFX024	6.1	20.01
BLD248	07TFX034	9.75	31.99
BLD249	07TFX033A	7.32	24.02
BLD250	07TFX033B	6.1	20.01
BLD251	07TFX032C	11.28	37.01
BLD252	07TFX032D	6.1	20.01
BLD253	07TFX032B	7.32	24.02
BLD254	07TFX032A	7.32	24.02
BLD255	07TFX032E	7.32	24.02
BLD256	10TFX032B	6.1	20.01
BLD257	06TFX387	7.62	25.00
BLD258	07TFX039	5.79	19.00
BLD259	07TFX697	5.49	18.01
BLD260	07TFX013A	3.05	10.01
BLD261	07TFX013B	3.05	10.01
BLD262	07TFX014	2.74	8.99
BLD263	07TFX017	6.1	20.01
BLD264	07TFX698	6.1	20.01
BLD265	07TFX035	1.83	6.00
BLD266	07TFX054A	0.76	2.49
BLD267	Op 11 A	7.62	25.00
BLD268	17TFX548	9.14	29.99

```
** Generated by AERSURFACE, dated 08009
** Center UTM Easting (meters):    700070.0
** Center UTM Northing (meters):  3173451.0
** UTM Zone:  14    Datum: NAD27
** Study radius (km) for surface roughness:   1.0
** Airport? N, Continuous snow cover? N
** Surface moisture? Average, Arid region? N
** Month/Season assignments? Default
** Late autumn after frost and harvest, or winter with no snow: 12 1 2
** Winter with continuous snow on the ground: 0
** Transitional spring (partial green coverage, short annuals): 3 4 5
** Midsummer with lush vegetation: 6 7 8
** Autumn with unharvested cropland: 9 10 11
**
   FREQ_SECT  ANNUAL  1
   SECTOR   1    0  360
**                    Sect    Alb      Bo        Zo
   SITE_CHAR    1       1     0.16     0.41     0.148
```

APPENDIX B
CULTURAL RESOURCE FILE SEARCH

CULTURAL RESOURCES FILE SEARCH, INVISTA PLANT IN VICTORIA COUNTY, TEXAS

PREPARED FOR:

WESTON SOLUTIONS, INC.

BY:
DANIEL J. ROSE AND RACHEL FEIT

AMATERRA ENVIRONMENTAL, INC.
AUSTIN, TEXAS

DECEMBER 2012

Location: The project area is defined as a point location within the existing INVISTA plant along the Victoria Barge Canal northwest of Bloomington, Texas in Victoria County and is depicted on the Bloomington (TX) USGS 1:24,000 topographic quadrangle (Figure 1). This project involves modifications to the current plant.

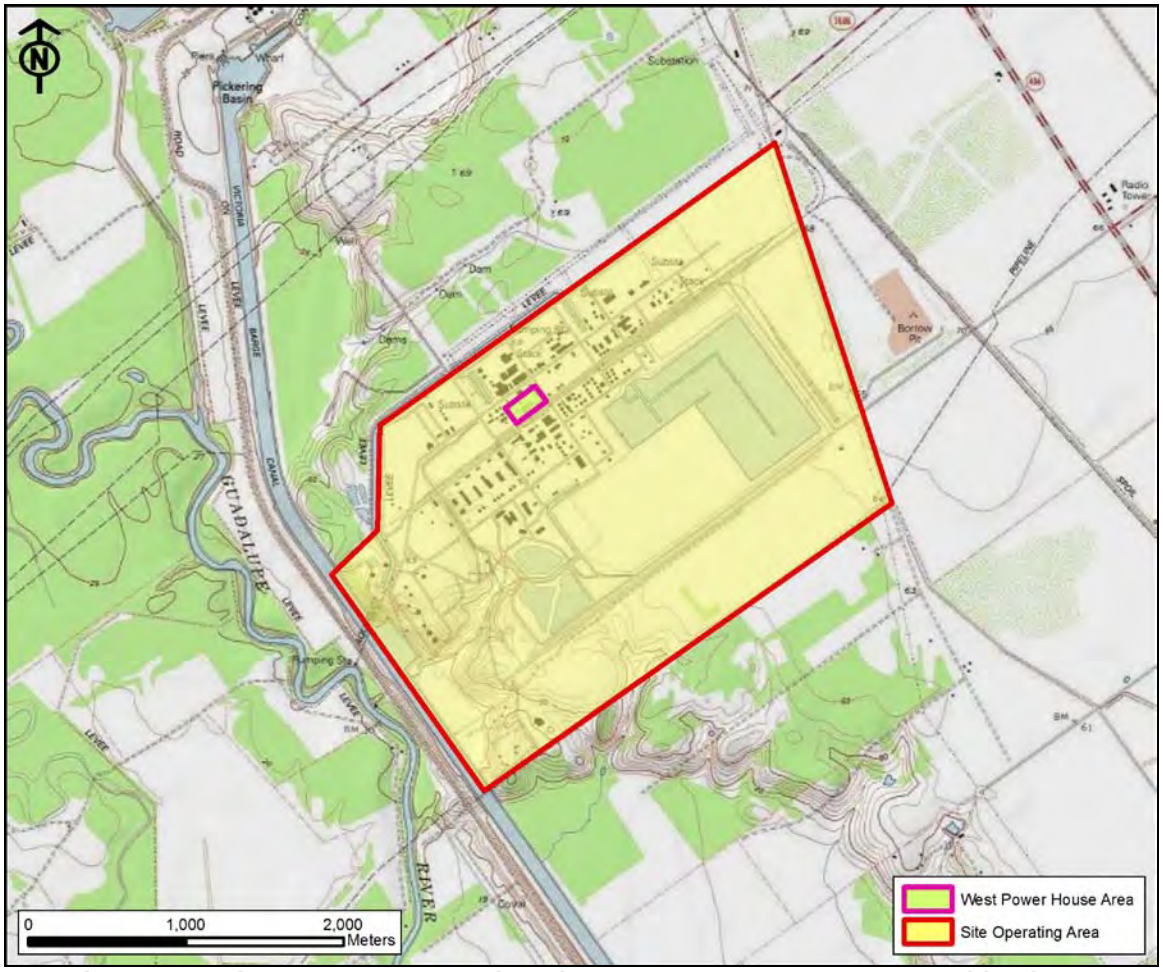


Figure 1. Project area on USGS Bloomington, Texas 1:24000 Topographic Sheet.

Topography. The project area is located on near-level terrain along the Victoria Barge Canal and the Guadalupe River in southern Victoria County, Texas. Elevation is about 65 to 70 feet above mean sea level.

Soils and geology. According to the USDA Soil Conservation Service, the project area falls within the Lake Charles-Urban land complex of soils, which means that buildings and other ground covering features are too tightly packed to allow soil differentiations. (NRCS 2012). The underlying geology of the project area is Quaternary-aged Beaumont Formation (Qbc and Qbs) composed of: clay, silt, sand, and gravel deposited along waterways within the past 2.6 million years. The Qbs variety is mainly clay and silt while the Qbc is mainly clay and mud (BEG 1992).

Previous Investigations. No portions of the survey area have been previously surveyed for archeological resources.

According to the Texas Historical Commission (THC) Atlas, there have been four archeological projects within three kilometers of the project area (THC 2012). Two of these projects were conducted by the Vicksburg District of the Army Corps of Engineers in the 1990's. In 1991 the Federal Energy Regulatory Commission (FERC) sponsored a testing project at 41VT98 south of the project location. In 2004 FERC sponsored a pipeline survey from just west of the plant to another pipeline across the Guadalupe River. (THC 2012) (Figure 2). Other projects sponsored by the Galveston District of the USACE along the Victoria Barge Channel have occurred, but do not appear on the online sites atlas.

Recorded Archeological Sites: According to the online Texas Archeological Sites Atlas and sites records at the Texas Archeological Research Laboratory (TARL), eight previously recorded archeological sites are located within three kilometers of the project location (THC 2012) (Figure 2).

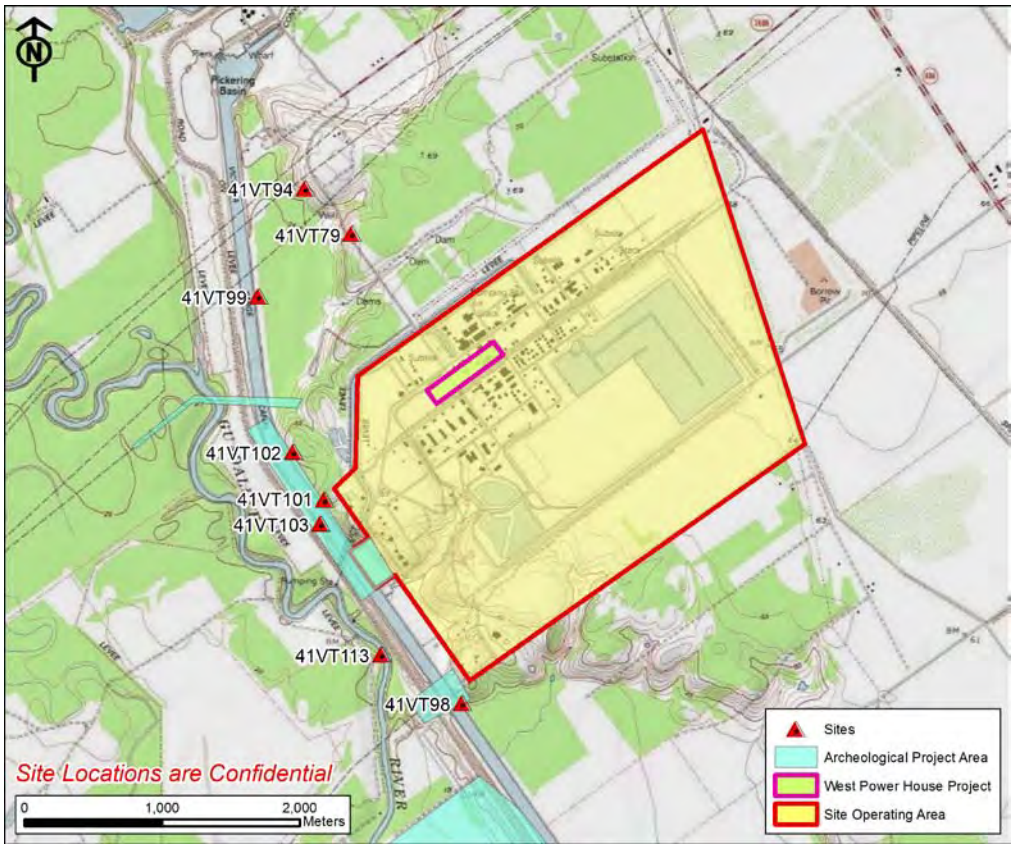


Figure 2. Project area, previously identified archeological sites and THC Data on USGS Bloomington, Texas 1:24000 Topographic Sheets.

- Site 41VT79, known as the Sentinel Oak Site, was recorded in 1980 during construction of a new road. It consists of an open campsite with both prehistoric and historic artifacts. The assemblage included lithic tools and debris, faunal material, and ceramics. The ceramics recorded were Native American ceramics as well as imported European and Oriental varieties. Controlled excavations took place at the site in 1981. These consisted of 2 2x2 foot test pits and 6 5x5 foot test units which recovered a variety of nineteenth century artifacts, as well as prehistoric choppers, bifaces, scrapers and projectile points representing the Late Archaic through Late Prehistoric periods. Of particular interest was a cache of five bifaces found just above basal clay in one of the test units. Ultimately, work determined that most of the site was already disturbed by preparations for roadway construction and that there was little remaining integrity. The site records do not specify the potential for listing on the National Register of Historic Places (NRHP) or as a State Archeological Landmark (SAL) and therefore the site's eligibility status is still unknown.

- Site 41VT94, known as the Blue Bayou Site, was first recorded in 1982 as an occupation site with prehistoric burials. The Center for Archaeological Research (CAR) at the University of Texas San Antonio (UTSA) conducted excavations that same year and removed 42 sets of human remains together with Late Prehistoric ceramics and arrow points. The human remains were dated to the early Late Prehistoric period. The project was led by Thomas Hester, Jake Ivy, Grant Hall and Al Wesolowsky. Due to the abundant data on prehistoric mortuary patterns the site has yielded, it is considered eligible for listing on the NRHP and as a SAL but is not currently designated.

- Site 41VT98, known as the Buckeye Knoll Site, was recorded in 1982 as being bisected by the Victoria Barge Canal. Initial findings noted that the site had several lenses of snail shell and some lithic flakes and cores. It was tested by Coastal Environments, Inc (CEI) in 1989 and 1991 and it was during these investigations that abundant intact stratified prehistoric deposits representing the Late Paleoindian through Late Prehistoric periods were uncovered. Additionally, archeologists found several fragments of human bone. Data Recovery took place at the site from 2000-2001 and uncovered the remains of more than 116 individuals from 75 discrete loci, as well as hundreds of other occupation features. Most of the burials date to the Early Archaic period, making them around 6,000 years old (Ricklis et al 2012). Site 41VT98 is today regarded as one of the most important sites in Texas for the data it has yielded relating to prehistoric lifeways along the inland coast. Although much information has already been gained from excavation of the site, a good portion of the site still remains intact and unexcavated. The site is considered eligible for NRHP and SAL listing though it is not currently listed as either.

- Site 41VT99 was recorded in 1989 by CEI as a stratified prehistoric occupation site. It was resurveyed and tested through backhoe trenches and 2 1x1 meter units in 1993 by Prewitt and Associates, and was recommended as eligible for NRHP/SAL listing because of its intact, stratified deposits that had potential to yield important data on prehistoric lifeways.

- Site 41VT101 was recorded in 1989 as an Early Archaic to Late Prehistoric site. A local informant said that in the early 1950's he collected an Ensor point from the site location. However, the site form notes that most of the site was destroyed by the 1950s Barge Canal construction and that it currently lacks integrity. For these reasons, the site was recommended as being not eligible for listing on the NRHP or as a SAL.

- Site 41VT102 was recorded in 1989 as a small surficial lithic scatter with no diagnostic artifacts. Given the small amount of material and the surficial nature of the site, investigators judged it to have no potential to yield significant new data about prehistoric lifeways. Therefore, the site was recommended as not eligible for listing on the NRHP or as a SAL.

- Site 41VT103 was recorded in 1989 as a small lithic scatter and a snail shell midden under several meters of dredge material. Recorders were not able to accurately assess the site through shovel tests due to dredge spoil over the top of it. They recommended additional shovel testing or backhoe trenching to better assess the vertical and horizontal extent of the site, as well as the cultural features and artifacts within it. Test pits and backhoe trenches were excavated in 1995 and based on work that suggested low data potential, the site was recommended as not eligible for NRHP/SAL listing (Gadus et al 1999).

- Site 41VT113 was recorded in 1993 as a historic suspension bridge over the Guadalupe River. The bridge is located more than one mile from the proposed APE and construction would not affect the existing viewshed of the resource. The bridge dates to the early 20th century and was used to move cattle across the river before the cattle were loaded onto vehicles for transport. The site form indicated that bridge is an unusual property type within the context of agriculture in Texas, and recommended that data concerning its construction and use should be collected. For these reasons this site was recommended as eligible for listing on the NRHP and/or as a SAL.

Cemeteries: No cemeteries are known to be located within the project area or within 3 km of the project area.

National Register Properties: No properties listed on the National Register of Historic places (NRHP) are located within the project area or within 3 km of the project

area. No National Register Districts are located within the project area or within 3 km of the project area.

Historical Structures: No buildings and/or structures recorded as historic by neighborhood surveys are located within the project area or within 3 km of the project area.

Historical Markers: No State of Texas historical markers are located within the project area or within 3 km of the project area.

Summary: The project location is within an industrially developed area of refineries. Eight archeological sites have been recorded in the vicinity (3 km radius), mostly along the canal and river. However, none of these sites would be impacted by any ground disturbing activities. Further, improvements to the existing plant within the project area would have no indirect effect on cultural resources since all standing structures and archeological sites are outside the viewshed of the proposed improvements. This cultural resources assessment recommends that that the project would have no effect on National Register listed properties, cemeteries, historic markers, shipwrecks, or buildings recorded by neighborhood surveys.

REFERENCES

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1992 Bureau of Economic Geology. The University of Texas at Austin. Austin, Texas.

Gadus, Eloise, Marie Blake, Martha Doty Freeman, and Karl W. Kibler
1999 *National Register Testing of Prehistoric and Historic Sites and Survey of Placement Areas, Channel to Victoria Project, Calhoun and Victoria Counties, Texas.* Reports of Investigations, Number 121. Prewitt and Associates, Inc., Austin.

Ricklis, Robert A., Richard A, Weinstein and Douglas C. Wells
2012 *Archaeology and Bioarchaeology of the Buckeye Knoll Site (41VT98), Victoria County, Texas*. Coastal Environments, Inc., Corpus Christi, Texas.

The Texas Historical Commission (THC) Online Atlas
2012 Texas Archaeological Sites Atlas. Electronic database, http://nueces.thc.state.tx.us/, accessed April 6, 2012.

Natural Resources Conservation Service (NRCS) Web Soil Survey
2012 http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

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EDUCATION:

MA in Anthropology, University of Texas at Austin 1995-1998. Thesis entitled *Mealtime Stories: A Study of Cooking and Daily Life at Farmhouse 151 in the Chora of Chersonesos, Ukraine.*
BA in Anthropology, University of Chicago 1986-1990, awarded with honors.

PROFESSIONAL EXPERIENCE:

September 2007-present, Principal Investigator- AmaTerra Environmental/Ecological Communications Corporation, Austin, Texas. Duties involve archeology program management and staff supervision. Responsibilities also include project management for NEPA document preparation, historic and prehistoric archeology projects under federal and state compliance regulations, historical archival research, artifact and data analysis, report writing, proposal/budget writing, and client/agency coordination.

October 1998-September 2007. Principal Investigator- Hicks & Company, Austin, Texas. Duties involved archeology program management and staff supervision. Responsibilities also include project management for NEPA document preparation, historic and prehistoric archeology projects under federal and state compliance regulations, historical archival research, artifact and data analysis, report writing, proposal/budget writing, and client/agency coordination.

July 1998-September 1998. Field Technician- PBS&J, Austin, Texas. Participated on excavation of a historic African American cemetery in Houston, Texas. Duties included excavation, recording and mapping of burials.

June 1995- June 1998. **Teaching and Research Assistant- Department of Anthropology and Department of Classics, University of Texas at Austin.** Assisted with lectures and graded papers for archeology undergraduate classes. Participated in three field seasons at Chersonesos, Ukraine. Devised methodology for ceramics analysis for Site 151 in Chersonesos, directed on-site ceramics lab in Austin and in Ukraine, contributed to Institute publications, and assisted with project planning for 1997 field season in Crimea, Ukraine.

September 1995-June 1996. Archeology Intern- Office of the State Archeologist, Austin, Texas. Worked closely with staff archaeologists compiling data for Texas Military Sites publication, catalogued slides, artifacts, and performed general office tasks. Assisted with excavations of a prehistoric burial site in San Antonio.

RESEARCH, TESTING AND DATA RECOVERY PROJECTS:

2011-2012. Tarrant Regional Water District. Excavation of Burials at the Montgomery Hill Cemetery (41NV716): A Post-Bellum African American Cemetery in Navarro County. Principal Investigator overseeing excavation of 25 unmarked graves dating from ca. 1865-1880. Designed and implemented the project and oversaw excavations. Reporting and analysis are ongoing.

2009- 2012. Texas Department of Transportation. Archeological Testing of 41DW277, Dewitt County, Texas. Project manager and Principal Investigator for archeological testing of a stratified multi-component prehistoric site in Dewitt County. Designed and implemented the project, oversaw excavations, and directed report preparation.

2009- City of Austin. Data Recovery at the Vara Daniel Site, 41TV1364. Co-Principal Investigator for data recovery of the Paleoindian component of a stratified multi-component site. Involved in project design, planning, implementation, and reporting. Also responsible for public outreach.

2008-2009- Fort Worth Corps of Engineers. Data Recovery at Sites 41BX254, 41BX256 and 41BX1628 along the San Antonio River, Bexar County, Texas. Co-Principal Investigator for data recovery of three stratified multi-component prehistoric sites along the San Antonio River. Involved in project design, planning, implementation, and reporting.

2007- Texas Department of Transportation. Archeological Testing of the Engstrand Well, Williamson County. Project manager and Project archeologist for archeological testing of a historic well in Williamson County. Designed implemented, conducted research, directed investigations and co-authored report.

2005-2007- Houston Independent School District. Archeological Testing of the Gregory Lincoln/HSPVA 4th Ward Property. Principal Investigator for archeological testing at a 16-acre site in downtown Houston. The project involved extensive archival research in advance of testing of domestic and commercial remains in a historically African American neighborhood at the edge of Houston's Freedmen's Town. The project also involved extensive testing for potential burials.

2006- City of Austin. Archeological Survey of the Mexican American Cultural Center
Principal Investigator for archeological survey in Downtown Austin. The project required intensive archival research in advance of survey. The survey documented remains of early twentieth century residences and the City of Austin's early twentieth century street and bridge department industrial facilities.

2005-2006- TxDOT/Kennedy Consulting, Inc.. Project Archeologist for testing at Site 41CC312. Ms. Feit's involvement included research design development, pre-field planning, investigations, and report writing.

2003-2004- Texas Parks and Wildlife. San Jacinto Battleground Restoration Project- Phase I, Harris County, Texas. Directed research investigations into the location of two roads leading into the San Jacinto Battlefield. This interdisciplinary project involved archival research, GIS mapping using a variety of historical and modern maps, sketches and aerial photography, and physical survey

to plot roads and historical features on the modern landscape. Also served as assistant project manager and field director for metal detector survey of private properties adjacent to the park.

2001- Texas Parks and Wildlife. Battleground Trail Project- Archeological Testing of Site 41HR865. Harris County, Texas. Co-Project Director for test excavations of an historic debris scatter on the San Jacinto Battlefield/Monument State Historical Park.

2003-2004- Chambers County. Archeological Testing at Fort Anahuac-41CH226, Anahuac, Texas. Principal Investigator and Project Manager for two phases of testing investigations of an 1830s Mexican fort in Anahuac Park. This NRHP-registered property was the site of the first armed skirmish leading to the Texas Revolution. Ms. Feit also produced and implemented a Cultural Resources Management Plan for the park as part of this project.

1999-2002- City of Austin/Morton & Mackey. Survey and Testing Investigations of Historic Guy Town, Austin, Texas. Project Archeologist for excavation of five city lots pertaining to Austin's red light district. The multidisciplinary project involved archival research, HABS assessment, and archeological testing.

2000-2002- City of Austin/Landmark Organization. Hilton Hotel Project, Dickinson-Hannig House. Austin, Texas. Project Archeologist, directing excavations on two city lots pertaining to an 1850s occupation, and Alamo survivor, Susanna Dickinson. The multidisciplinary project involved archival research, HABS assessment, and archeological testing.

1999- City of Austin. Archeological Testing of Blocks 33 and 34 in the City of Austin. Crew Chief for survey and testing of two city blocks. The project documented numerous historical features pertaining to nineteenth century Austin.

1998-2000- Travis County Transportation and Natural Resources. Data Recovery at Toyah Bluff. Crew chief and post-field Project Archeologist for data recovery of a Late Prehistoric occupation site (41TV441). Work included field direction and management, report writing and ceramic analysis.

1998- U.S. Housing Authority. Cemetery Removal at Allen Parkway Village, Houston, Texas. Field Technician for burial removal at a nineteenth and early twentieth century African American Cemetery.

1995- City of Brackettville. Archeological Survey and Testing along a proposed wastewater line in Fort Clark, Kinney County, Texas. Project involved testing at three prehistoric sites and one historic Buffalo Soldier dwelling.

SURVEYS AND MONITORING:

2012- Michael Baker Jr.- Archeological Survey of Three Segments of the Grand Parkway Project in Harris and Montgomery Counties, Texas. Principal Investigator for 36 miles of survey for a new location roadway. The project also involved NRHP-testing at Site 41MQ197 in Montgomery County.

2012- CP&Y/ODOT- Archeological Survey for a Proposed Bridge Replacement along SH 79 Across the Red River in Clay County, Texas and Jefferson County, Oklahoma. Principal Investigator for two mile survey and proposed bridge replacement.

2011- HDR, Inc.- Archeological Survey of SH 360 in Tarrant, Ellis and Johnson Counties, Texas. Principal Investigator for nine mile survey of new location roadway. Survey documented two twentieth century archeological sites.

2011- TxDOT- Archeological Survey along FM 2214 in Eastland County, Texas. Principal Investigator for five mile survey of proposed road expansion.

2011- CP&Y, Inc.- Archeological Survey along SH 76 Garvin and McLain Counties Oklahoma. Principal Investigator for survey along eight mile segment of SH 76. Survey documented no new sites.

2011- CH2MHill- Cultural Resources Survey of Zink Lake in Tulsa, Oklahoma. Principal Investigator for cultural resources survey of proposed improvements to Zink Lake in the City of Tulsa. Resources evaluated included an early twentieth century railroad bridge.

2011- TxDOT- Archeological Survey of Detention Ponds and Mitigation Sites along FM 1464 in Sugar Land, Fort Bend County, Texas. Principal Investigator for survey of approximately 14 acres set aside for detention ponds and mitigation areas. Survey documented one new twentieth century archeological site.

2010- TxDOT- Archeological Survey of Two Yoakum District Bridges, Austin and Jackson Counties, Texas. Principal Investigator for survey in advance of two bridge replacements. Survey documented no new resources.

2010- HDR, Inc.- Archeological Survey of a Solar Array Site in Lampasas, Lampasas County, Texas. Principal Investigator for four acre site proposed for solar array in the City of Lampasas. Survey documented no new resources.

2010 Civil Associates, Inc.- Archeological Survey along FM 720, Denton County, Texas. Principal Investigator for survey along five mile segment in Denton County, Texas. Survey documented no new resources.

2010- CP&Y, Inc.- Archeological Survey along Loop 288 Denton County Texas. Principal Investigator for eight mile survey of new location roadway in Denton County, Texas. Survey documented no new resources.

2010- Baer Engineering, Inc.- Archeological Survey of the Green Water Treatment Plant Site in the City of Austin, Travis County, Texas. Principal Investigator for survey of two downtown blocks in the in the City of Austin. Project included detailed archival research and documentation of one new nineteenth century archeological site.

2010- TxDOT- Archeological Survey and Limited Testing along SH 195 in Williamson County. Principal Investigator for archeological survey along 20 miles of new location and expansion of SH

195. The project included archival research and limited testing of one nineteenth century archeological site and documentation of eight additional historic and prehistoric archeological sites.

2010- TXDOT- Marine Archeological Survey of the Red River at SH 37, McCurtain County, Oklahoma. Project Manager for marine survey of the Red River at SH 37. Survey documented no new resources.

2010- Jacobs Engineering- Archeological Survey along FM 1431- the Hines Tessera Development Travis County Texas. Principal Investigator for proposed expansion along one mile segment in Travis County. The survey documented two new sites, one historic and one prehistoric lithic scatter.

2009-2010- ODOT/CPY, Inc.- Archeological Survey of Carpenter's Bluff, Grayson County Texas and Bryan County Oklahoma. Principal Investigator for bridge replacement over the Red River. Survey documented no new resources.

2009- LTRA Engineers- Archeological Survey of Eight Denton County Bridges, Denton County, Texas. Principal Investigator for survey of seven bridge replacements in Denton County. Survey documented no new resources.

2009-2010-TxDOT- Archeological Survey Along SH 35 in Copano Bay, Aransas County Texas. Principal Investigator for a proposed causeway replacement over Copano Bay. Served as PI for terrestrial portion of the survey and project manager for two phases of marine survey in the bay.

2009- TxDOT/Michael Baker Corporation- Archeological Reevaluation along FM 865 from Beltway 8 to FM 518 in Brazoria County, Texas. Principal Investigator for survey of additional right of way along FM 865 in Pearland, Texas.

2009/2010- City Of Austin/Baer Engineering. S. IH 35 Water/Wastewater Program Project. Principal Investigator for 17 mile survey in southeast Travis County.

2009- San Antonio Water System (SAWS). Archeological Survey of SAWS' Medio Creek Recycled Water line, San Antonio, Texas. Principal Investigator for 4.8 mile water line.

2007-2009- Cox|McLain Environmental Consulting/Brazos Electrical Power Cooperative. Archeological Surveys in Various North Texas Counties. Principal Investigator for electrical transmission substation surveys in McLennan, Ellis, Navasota, Robertson, and Stephens Counties.

2008- San Antonio Water System (SAWS). Archeological Survey in San Antonio's HemisFair Park. Principal Investigator for proposed condensate line to be installed in historic downtown San Antonio.

2008- TxDOT/Michael Baker Corporation- Archeological Survey of SH 35 from IH 45 to Bellfort in Houston. Principal Investigator for proposed tollway construction in Houston, Texas.

2008- TxDOT/Turner, Collie, and Braden, Inc.- Archeological Survey along SH 99 from Katy to Sugar Land in Harris and Fort Bend County. Principal Investigator for road expansion survey**.**

2008- Oklahoma DOT/Chiang Patel & Yerby- Archeological Survey for NW122nd Street in Oklahoma City. Principal Investigator for road expansion survey in Oklahoma City**.**

2008- Oklahoma DOT/Chiang Patel & Yerby- Archeological Survey for SH 36 in Cotton County, Oklahoma. Principal Investigator for road expansion survey in Southern Oklahoma. Survey recorded two historic-age sites**.**

2008- Texas Parks and Wildlife Department- Archeological Survey of Village Creek State Park, Hardin County, Texas. Principal Investigator for 1090-acre survey of Village Creek State Park near Beaumont, Texas.

2008- City of Austin. Archeological Survey of the Waterloo Park and Waller Beach, Travis County, Texas. Principal Investigator for archeological survey in Downtown Austin. The project required intensive archival research in advance of survey. The survey documented remains of early twentieth century residences in Waterloo Park.

2008- Cox|McLain Environmental Consulting. City of Kermit Wastewater Treatment Plant. Principal Investigator for 250 acre survey in Winkler, County, Texas. The project documented one new prehistoric site.

2008 – Teague, Nall & Perkins. Windhaven Boulevard Survey. Principal Investigator for archeological survey in areas of proposed right of way expansion and new location roadway in Dallas County, Texas.

2008- HDR, Inc. Archeological Survey along US 385 in Crane and Upton Counties. Principal Investigator for archeological survey in areas of proposed right of way expansion along a 21-mile section of road.

2007-2008 Boeing Corporation. Archeological Survey of Secure Border Initiative Locations in the Nogales and Ajo Sector, Arizona. Field archeologist for inspections and assessments of 1-acre communications tower locations in southern Arizona.

2007- Professional Engineering Design/TxDOT San Antonio District. Archeological Survey of East Metate Creek. Principal Investigator for archeological survey for a proposed bridge expansion across Metate Creek in Atascosa County.

2007- City of Pleasanton. Archeological Survey of the Pleasanton Wastewater Pipeline. Principal Investigator for a three-mile wastewater line in Atascosa County. Involved in all project phases including design coordination, fieldwork and reporting.

2007- Texas Department of Transportation. Archeological Survey Along FM1044 from IH35 to Weil Rd. Principal Investigator for archeological survey in areas of proposed right of way expansion and new location roadway.

2007- Texas Department of Transportation. Archeological Survey for a Proposed Office Site in Medina County. _ Principal Investigator for a 12-acre office site. Involved in all project phases including design coordination, fieldwork and reporting.

2007- Texas Department of Transportation, Laredo District. Archeological Survey of Cuatro Vientos Road, Webb County, Texas. Principal Investigator for survey of four miles of proposed new location roadway.

2007- Texas Department of Transportation, Odessa District. Archeological Survey of SH 349 in Midland and Martin Counties, Texas. Project Archeologist for survey of forty miles of proposed road expansion.

2006- Brazos Electric Power Cooperative. Archeological Monitoring at Site 41BL95, Cedar Valley. Project director for archeological monitoring at site 41BL95. Investigations involved extensive agency coordination and excavation of one 1x1 meter test unit for purposes of assessing archeological deposits at a prehistoric campsite.

2006- Targa Resources, Inc. Archeological Survey of the Proposed Targa North Shore Gas Pipeline Project in Young County, Texas. Principal Investigator for seven–mile natural gas pipeline. Involved in all project phases including design coordination, fieldwork and reporting.

2006- Texas Department of Transportation, Pharr District. Archeological Survey of the US 83 Reliever Route from Roma to Rio Grande City in Starr County, Texas. Principal Investigator for survey of 11 miles of new location roadway.

2006- City of Laredo. Archeological Survey of Chacon Creek Wastewater Line Extension. Principal Investigator for five mile waterline survey. The survey documented two prehistoric sites.

2006- Travis County Transportation and Natural Resources. Archeological survey of the Travis County Eastside Service Center. Principal Investigator for survey of a 120-acre tract in eastern Travis County. The project documented one new prehistoric archeological site.

2006- Texas Department of Transportation., Austin District. Archeological Survey of US 290 from Paige to Giddings in Bastrop and Lee Counties. Principal Investigator for archeological survey in areas of proposed right of way expansion for US 290. The survey recorded two new prehistoric sites, 41BP813 and 41BP814.

2006- City of Austin. Archeological Survey of the Gilleland Basin-North Austin Wastewater Interceptor in Manor, Texas. Principal Investigator for a one-mile water interceptor. Involved in all project phases including design coordination, fieldwork and reporting.

2006- Chambers County Economic Development Office. Chambers County Park Survey. Principal Investigator and Project Manager for a project that involved archeological survey of three parks in Chambers County—Double Bayou Park, Job Beason Park, and Hugo Point Park.

2005- Bell County WCID and Lockwood, Andrews and Newnam, Inc. Archeological Survey of the Bell County Effluent Pipeline from South Bell County WWTP to Nolan Creek. Principal

Investigator for 4.5–mile water transmission pipeline. Involved in all project phases, including design coordination, fieldwork and reporting.

2005- Texas Department of Transportation, Paris District. Archeological Survey of US 69 from Greenville to Lone Oak. Principal Investigator for 11 miles of road expansion.

2005- City of Brownsville. Archeological Survey of the Texas Historic Battlefield Trails Southern Pacific Linear Park, Brownsville, Texas. Principal Investigator for survey of proposed 4-mile park trail.

2005- Brazos Electric Power Cooperative, Archeological survey for a new transmission line in Parker and Palo Pinto Counties. Principal Investigator for survey of new location electrical transmission line extending approximately 40 miles.

2005- Texas Department of Transportation, Fort Worth District. Archeological Survey for Lake Ridge Parkway. Principal Investigator for survey of two miles of new location roadway.

2004-7- TxDOT/Lone Star Infrastructure. SH130 Environmental Management. Oversaw survey, analysis and archival research of selected historic archeological sites in eastern Travis, Caldwell, and Guadalupe Counties. Developed a detailed predictive model for archeological site types and patterning for Travis, Caldwell and Guadalupe Counties that submitted to TxDOT and the THC for coordination.

2004- TxDOT. SH130-IH10 Interchange Alternatives, Guadalupe County Texas. Created probability study to determine the potential occurrence of archeological sites, then served as Principal Investigator for an intensive survey of high probability areas for two roadway alternatives. Assisted planning team in alternatives assessment.

2004- Kinder Morgan. Archeological Survey of the Sand Hill Pipeline, Travis County, Texas. Principal Investigator for survey of six mile gas pipeline.

2004- Doucett & Associates. Archeological Survey for a Proposed Retail Center in Williamson County, Texas. Principal Investigator for 20-acre survey for a proposed Walmart. The project documented one historic period farmstead site.

2004- American Electric Power- Roma to Frontera Archeological Survey, Starr and Hidalgo Counties, Texas. Principal Investigator for a 40-mile long transmission line survey along the US-Mexico border. Seven prehistoric sites were documented and recorded. Ms. Feit worked closely with AEP to develop avoidance strategies for NRHP-eligible sites.

2003- City of Lubbock. McAlister Park Geoarcheological Survey, Lubbock, Texas. Principal Investigator and Project Manager for a geoarcheological survey of a playa lake in a proposed city park in Lubbock Texas.

2003- San Antonio Water System, Archeological Survey of the Dos Rios Water Recycling Center in Bexar County, Texas. Principal Investigator for an archeological survey in advance of bank stabilization at a water recycling center along the Medina River.

2003 TxDOT. SH45 Southeast Archeological Survey, Travis County Texas.
Created probability study to determine the potential occurrence of archeological sites, then served as Principal Investigator for an intensive survey of high probability areas for three roadway alternatives.

2003-2007- Austin Clean Water Program, various engineers, Travis County Texas. Ms. Feit served as lead archeological liaison and Principal Investigator for City of Austin environmental assessments performed prior to sewer line upgrades. Conducted archeological surveys in support of numerous projects.

2002- Texas Parks and Wildlife-Hog Bayou Moist Soils Unit Survey. Calhoun County, Texas. Principal Investigator for archeological survey for proposed wetlands mitigation areas within the Guadalupe Delta Wildlife Area. The project relocated and reassessed Site 41CL94 a late prehistoric shell midden.

2002-2003- TxDOT. Archeological Survey of SH155 Frankston-Pert, Anderson County, Texas. Principal Investigator for archeological survey of proposed 11-mile roadway expansion area in northeast Texas.

2002- Archeological Survey of Proposed Channelization of Dry Branch Creek, Williamson County, Texas. Principal Investigator for a proposed creek channelization along Dry Branch Creek.

2001-2002 TxDOT. George Bush Turnpike Reconnaissance Survey. Dallas County, Texas. Principal Investigator for a reconnaissance survey of three reported sites located in the proposed George Bush Turnpike right-of-way.

2001 TxDOT. Loop 1 Survey Investigations. Travis and Williamson County Texas. Principal Investigator for 280-acre roadway survey. The survey documented four historic period farmstead sites and two prehistoric lithic scatters.

2001- City of Round Rock. Archeological Survey of Arterial B Roadway. Principal Investigator for survey of new location roadway.

2001- Texas Parks and Wildlife. Survey of Lake Houston State Park. Project director for the survey of proposed water lines in Lake Houston State Park in Montgomery County, Texas.

2000-2001- Williamson County. Southwest Regional Williamson County Park Survey. Williamson, County Texas. Principal Investigator for survey of an 800-acre park site in Williamson County, Texas. The survey documented three prehistoric sites, and recommended avoidance for two of those sites.

2000- San Antonio Water System. Reconnaissance Survey, Bexar County, Texas. Principal Investigator for a reconnaissance survey of a sixteen-mile water pipeline in southern Bexar County.

2000- City of Round Rock. Archeological Survey Along Chandler Creek, Williamson County, Texas. Project Archeologist for survey of a proposed wastewater line**.**

2000- City of Georgetown. Pecan Branch Wastewater Treatment Plant Survey. Georgetown, Texas. Principal Investigator on a survey of 46 acres along Pecan Branch and Berry Creek in Williamson County, Texas.

2000- Parkhill, Smith & Cooper. Archeological Survey at Yellowhouse Draw, Lubbock, Texas. Project Archeologist for survey of proposed storm sewer**.**

1999- Marchbanks Engineering- Rio Hondo Water Treatment Plant, Cameron County, Texas. Project archeologist for intensive survey of a 25-acre water treatment plant site in Rio Hondo.

1999- Archeological Survey of Lohman's Crossing Road, Travis County, Texas. Crew Chief for survey of new location roadway.

1999- Survey Investigations Along FM 1431 and Cottonwood Creek - Cedar Park, Texas. Project archeologist for survey of water/wastewater pipeline.

1999- TxDOT/Carter-Burgess, Archeological Survey of SH 121 Toll Road in Fort Worth, Texas. Crew Chief for survey of new location roadway.

1998- Maverick County Landfill Survey, Maverick County, Texas. Project archeologist for 250-acre landfill site along the Texas-Mexico border south of Eagle Pass, Texas. The survey consisted of extensive shovel testing and backhoe trenching, documenting three prehistoric sites.

1997- City of Lampasas, Archeological Survey at Hanna Springs Park, Lampasas County, Texas. Crew chief for archeological survey and limited testing of a historic-period hot springs spa.

POPULAR AND SCHOLARLY JOURNAL PUBLICATIONS:

1999-present. Regular contributor to the *Austin Chronicle* Cuisines and Arts section

2008 Contextualizing Material Culture: Some Thoughts on an African American Community in Houston's 4th Ward in the Early 20th Century, co-authored with Bradford M. Jones. In *Bulletin of Texas Archeology,* October 2008.

2007 A Story of Freedom, *American Archaeology Magazine*, Autumn 2007

2005 Book review of *Under Four Flags: History and Archeology of North Loop One, Travis County, Texas,* by John W. Clark. In *Bulletin of the Texas Archeological Society*, Vol. 76

2003 Peas on Earth. In *Saveur Magazine,* Vol. 71, December 2003, pp.17-18

2003 Defining the Caddoan Culture. In *American Archaeology Magazine*, Vol. 7 No. 1, Spring 2003

2002 Urban Secrets Revealed. In *Texas Heritage Magazine,* Fall 2002

2000 Archeological Investigations in a Nineteenth Century Neighborhood. In *Current Archeology in Texas*, Vol. 2 No. 2

1999 Restaurant reviews published at San Antonio citysearch.com

CRM PUBLICATIONS- RESEARCH, TESTING, AND DATA RECOVERY REPORTS:

Bonine, Mindy, Rachel Feit and Antonio Padilla
2012 *Changing Lifeways Along the Guadalupe Basin in South Texas. The Results of National Register Testing of a Stratified Multicomponent Site (41DW277) in DeWitt County, Texas*. AmaTerra Environmental, Inc., Austin.

Padilla, Antonio E. and David L. Nickels (Rachel Feit, contributor)
2010 *Archaeological Data Recovery on Three Sites along the San Antonio River, Bexar County, Texas.* Ecological Communications Corporation, Austin.

Nickels, David L., Mason D. Miller and W. Nicholas Trierweiler (Rachel Feit, contributor)
2010 *Archeological Excavation of a Deeply Buried Paleoindian Component at the Vara Daniel Site (41TV1364), Travis County, Texas*. Ecological Communications Corporation, Austin.

Feit, Rachel, Bradford M. Jones and Mason D. Miller
2007 *A Lotta People Have Histories Here: History and Archeology of Houston's Vanishing Freedmen's Town.* Archeology Series No. 184. Hicks & Company, Austin.

Feit, Rachel and Bradford M. Jones
2007 *Archeological Testing of the Engstrand Well, Williamson County, Texas*. Archeology Series No. 190. Hicks & Company, Austin.

Feit, Rachel, and Bradford M. Jones
2006 *An Archeological Inquiry into Austin's Daily Life and City Services at the Turn of the Twentieth Century: Archeological Survey of the Mexican American Cultural Center in Downtown Austin, Travis County, Texas.* Archeology Series No. 165. Hicks & Company, Austin.

Feit, Rachel, Brian King, Bradford Jones and Robert Lassen
2006 Archeological Testing of Prehistoric Sites 41CC311 and 41CC312, Concho County, Texas. Archeology Series No. 160. Hicks & Company, Austin.

Feit, Rachel and John W. Clark
2004 *Archeology and History at Fort Anahuac: Results of the 2003 Season Excavation in Chambers County, Texas.* Archeology Series No. 132. Hicks & Company, Austin.

Karbula, J.W., J.H. Jarvis and R. Feit
2004 *Metal Detecting Along the Path of the Mexican Retreat at San Jacinto.* Archeology Series No. 124. Hicks & Company, Austin.

Rachel Feit, John Clark, James Karbula, Jonathan Jarvis
2004 *Archeological and Historical Research at the San Jacinto Battleground Volume I, The Roads to San Jacinto; Research Investigations for the Harrisburg-Lynchburg and New Washington Roads*. Hicks & Company, Austin.

Feit, Rachel and John W. Clark
2003 *Fort Anahuac: Archeological Testing at a Mexican Era Fort in Chambers County, Texas.* Archeology Series No. 115. Hicks & Company, Austin.

Feit, R, J.W. Karbula, J. Clark and S. C. Caran
2003 *Boarding Houses, Bar Room and Brothels- Life in Vice-District: Archeological Investigations of A Changing Urban Neighborhood in Austin, Texas.* Two Volumes. Archeology Series No. 104. Hicks & Company, Austin.

Feit, Rachel and John W. Clark
2003 *Managing Cultural Resources at Fort Anahuac Park: A Management Plan.* Hicks & Company, Austin.

Feit, Rachel and John Clark
2002 *Archeological and Historical Research Investigations on the Historic Hannig-Dickinson House and the Hedgecoxe House in Austin, Texas.* Archeology Series No. 109. Hicks & Company, Austin.

Feit, Rachel, John Andrew Moreman and John W. Clark
2002 *Archeological Test Excavations at Site 41HR865: An Historic Debris Scatter at the San Jacinto Battlefield/Monument State Historic Park.* Archeology Series No. 105. Hicks & Company, Austin.

Karbula, James W., Rachel Feit and T. G. Griffith
2001 *Changing Perspectives on the Toyah: Data Recovery Investigations of 41TV441, The Toyah Bluff Site, Travis County, Texas*. Archeology Series No. 94. Hicks & Company, Austin.

Seibel, Scott, Rachel Feit and Susan Dial
2000 *Robert E. Johnson State Office Building Project: A Compilation Volume for Areas A, B and C.* Hicks & Company, Austin.

Dial, S.W. and J.W. Karbula, eds.
2000 *Archeological Investigations of Blocks 33 and 34: The Austin Convention Center Expansion Project.* Archeology Series No. 73 Hicks & Company, Austin.

CRM PUBLICATIONS- SURVEY REPORTS:

Padilla, Antonio, Rachel Feit, and Matthew Carter
Archeological Survey of SH 360 from Green Oaks Boulevard to US 2878 in Tarrant, Ellis and Johnson Counties, Texas. Ecological Communications Corporation, Austin.

Miller, Mason and Rachel Feit
Interim Report for Archeological Survey along FM 2214 from in Eastland County, Texas. Ecological Communications Corporation, Austin.

Feit, Rachel and Kurt Korfmacher
Phase 1 Cultural Resources Report for the Arkansas River Zink Lake Improvements Project in Tulsa, Tulsa County, Oklahoma. Ecological Communications Corporation, Austin.

Feit, Rachel and Alex Voellinger
Archeological Survey of Two Detention Ponds and a Wetland Mitigation Site along FM 1464 in Sugar Land, Fort Bend County, Texas. Ecological Communications Corporation, Austin.

Darnell, Bruce and Rachel Feit
Archeological Survey of Two Yoakum District Bridges, Austin and Jackson Counties, Texas. Ecological Communications Corporation, Austin.

Dowling, Jon J. Rachel Feit and Daniel J. Rose
Archeological Survey of Proposed Loop 288 from IH 35E North to IH 35E at Vintage Boulevard, Denton County Texas. Ecological Communications Corporation, Austin.

Feit, Rachel and Emory Worrell
Archeological Survey of the Green Water Treatment Plant Site in the City of Austin, Travis County, Texas. Ecological Communications Corporation, Austin.

Anthony, Dana and Rachel Feit
Archeological Survey along SH 195 from IH 35 North to .8 miles South of the Bell County Line in Williamson County, Texas **.** Ecological Communications Corporation, Austin.

Dowling Jon J. and Rachel Feit
Archeological Survey along a Segment of FM 1431 in Lago Vista, Travis County, Texas. Ecological Communications Corporation, Austin.

Dowling, Jon J. and Rachel Feit
Archeological Survey of Carpenter's Bluff, Grayson County Texas and Bryan County Oklahoma. Ecological Communications Corporation, Austin.

Dowling, Jon J. and Rachel Feit
An Archeological Survey of Eight Off-System Bridges, Denton County, Texas. Ecological Communications Corporation, Austin.

Enright, Jeffrey, Rachel Feit and Jon J. Dowling
A Marine and Terrestrial Survey of the Copano Bay Causeway Replacement in Aransas County, Texas. Ecological Communications Corporation, Austin.

Jones, Richard S., Antonio E. Padilla, W. Nicholas Trierweiler, and Rachel J. Feit
2008 *Cultural Resource Inventory of 878 Acres at Lake B.A. Steinhagen and Lake Sam Rayburn, Jasper, Nacogdoches, and San Augustine Counties, Texas.* Ecological Communications Corporation, Austin

Feit, Rachel
2008 *An Archeological Survey of the Proposed Bridge Replacement Along CR 427 at East Metate Creek.* Ecological Communications Corporation, Austin

Feit, Rachel, David L. Nickels and Richard Jones
2008 *Archeological Survey of Village Creek State Park, Hardin County, Texas*. Ecological Communications Corporation, Austin.

Nickels, David L., Richard S. Jones, W. Nicholas Trierweiler, Rachel J. Feit and Antonio E. Padilla
2008 *Archeological Investigations at Lake Whitney, Bosque, Hill and Johnson Counties, Texas.* Ecological Communications Corporation, Austin.

Nickels, David, and Rachel Feit
2008 *Archeological Survey of the City of Kermit's Proposed Wastewater Treatment Facility in Winkler County, Texas.* Ecological Communications Corporation, Austin.

Padilla, Antonio E. and Rachel Feit
2008 *An Archeological Survey along US 385 from Crane to McCamey*. Ecological Communications Corporation, Austin.

Rachel Feit
2008 *An Archeological Survey Along Windhaven Parkway, Collin County Texas*. Ecological Communications Corporation, Austin.

Stotts, Matthew, Rachel Feit, Robert Lassen
2007 *An Archeological Survey Along US 290 from Paige to Giddings*. Hicks & Company, Austin.

Feit, Rachel
2007 *Archeological Survey for a Proposed TxDOT Hondo Area Office Site, Medina County, Texas.* Hicks & Company, Austin.

Feit, Rachel and Matthew C. Stotts
2007 *Archeological Survey of FM 1044 Improvements from IH 35 to Weil Road in Comal and Guadalupe Counties, Texas, CSJ 2021-01-009.* Hicks & Company, Austin.

Feit, Rachel, John Campbell, Matthew Stotts, Robert Lassen
2007 *Results of Archeological Investigations of US 183 Improvements from US 183/US 183- A Interchange to SH 29 Williamson County, Texas.* Hicks & Company, Austin.

John Campbell, Rachel Feit, Matthew C. Stotts and Bradford Jones
2007 *Archeological Survey of the Proposed CuatroVientos Roadway From Mangana-Hein Road to US83/Espejo-Molina Road Webb County, Texas.* Hicks & Company, Austin.

Jones, Bradford, Rachel Feit, and Matt Stotts
2007 Intensive Archeological Survey of the Proposed Expansion of State Highway 349 from Two Miles North of the Martin and Midland County Line to 1.26 Miles South of FM 2052 South of Lamesa, Texas, CSJ# 0380-08-012, 0380-07-018. Hicks & Company, Austin.

Matthew C. Stotts, Rachel Feit and Mason Miller
2007 *Results of Archeological Investigations of a Proposed Wastewater Line Along Spanish Oak Creek in Williamson County, Texas.* Hicks & Company, Austin.

Brian King & Rachel Feit
2006 *Archeological Survey of the Proposed Targa North Shore Pipeline Project in Young County, Texas.* Hicks & Company, Austin.

Feit, Rachel
2006 *Archeological Survey for the City of Laredo's Chacon Creek Wastewater line Extension, Webb County, Texas.* Hicks & Company, Austin.

Feit, Rachel and Brian Farabough
2006 *Archeological Survey Investigations at Three Chambers County Parks, Chambers County, Texas.* Hicks & Company, Austin.

Feit, Rachel
2006 *Archeological Survey of the Gilleland Basin-North Austin Wastewater Interceptor in Manor, Texas.* Hicks & Company, Austin.

Feit, Rachel and Matt Stotts
2006 *Archeological Survey of the Proposed Eastward Extension of the George Bush Turnpike, Dallas County, Texas.* Hicks & Company, Austin.

King, Brian and Rachel Feit
2006 *Archeological Survey of the Proposed US 83 Reliever Route from Roma to Rio Grande City in Starr County, Texas.* Hicks & Company, Austin.

Miller, Mason and Rachel Feit
2005 *Archeological Survey for US Highway 69 from FM 1570 in Greenville to FM 513 in Lone Oak, Hunt County, Texas.* Hicks & Company, Austin.

Brian King, Rachel Feit
2005 *Archeological Survey of the Proposed Texas Historic Battlefield Trails Southern Pacific Linear Park, Brownsville, Texas.* Hicks & Company, Austin.

Feit, Rachel
2005 *An Archeological Survey of the Proposed Effluent Pipeline from South Bell County WWTP to Nolan Creek.* Hicks & Company, Austin.

Feit, Rachel
2005 *SH-45 Southeast Summary of Survey Investigations.* Hicks & Company, Austin.

Feit, Rachel and John Campbell
2005 *Archeological Survey along Fish Creek, within the Proposed Extension to Lake Ridge Parkway; Dallas and Tarrant Counties, Texas.* Hicks & Company, Austin.

Feit, Rachel and Jonathan H. Jarvis
2004 *Archeological Survey of the Roma to Frontera Electrical Transmission Line, Starr and Hidalgo Counties, Texas*. Hicks & Company, Austin.

Karbula, James W., J. Jarvis, R. Feit, and J. Moreman
2003 *Intensive Archeological Investigations of the Wonderworld Drive Extension: FM3004 in Hays County, Texas.* Hicks & Company, Austin.

Feit, Rachel, John Campbell, Brian King
2004 *Archeological Survey of the Proposed Sand Hill Pipeline for Kinder Morgan in Travis County, Texas*. Hicks & Company, Austin.

Jarvis, Jonathan H. and Rachel Feit
2004 *Archeological Survey of the Proposed Wild Horse Ranch Northwest Wastewater Interceptor Line and Treatment Plant, Travis County, Texas.* Hicks & Company, Austin.

King, Brian and Rachel Feit
2004 *Results of Archeological Field Investigations of Two Newly Proposed Alternatives for the SH130-IH10 Interchange in Guadalupe County, Texas.* Hicks & Company, Austin.

Miller, Mason and Rachel Feit
2004 *Archeological Survey for a proposed Retail Center in Southern Williamson County*. Hicks & Company, Austin.

Miller, Mason and Rachel Feit
2004 *An Archeological Survey in Bartholomew Park; Investigations for the City of Austin's Planned Wastewater Line Improvements and Channel Restabilization along Tannehill Creek from Broadmoore to Cameron Roads.* Hicks & Company, Austin.

Miller, Mason D. and R. Feit
2003 *Results of the Archeological Survey for the Eubank Acres Water and Wastewater Improvement Project in Austin, Texas.* Hicks & Company, Austin.

Aiuvalasit, Michael and Rachel Feit

2003 Upper *Tannehill/Lower Fort Branch Sewer Line Upgrade Archeological Survey.* Hicks & Company, Austin.

Aiuvalasit, Michael, S. C. Caran w/contribution by R. Feit
2003 *Results of Geoarcheological Investigations at a Playa Lake in McAlister Park, Lubbock, Texas.* Hicks & Company, Austin.

Campbell, John A., Rachel Feit, Reign Clark, Nesta Anderson, and Julie Adams McClellan
2003 *Archeological Survey of State Highway 155 from Frankston to Pert Anderson County, Texas.* Hicks & Company, Austin.

Feit, Rachel ; Campbell, John A.
2003 *Results of the Loop 1/SH45 Additional Right of Way Archeological Survey in Williamson and Travis Counties, Texas.* Hicks & Company, Austin.

Feit, Rachel, Jonathan Jarvis
2002 *Archeological Survey of the Proposed Channelization of Dry Branch Creek Williamson County, Texas.* Hicks & Company, Austin.

Moreman, J. Andrew, Jonathan H. Jarvis, and Rachel Feit
2002 *Cultural Resource Survey of Proposed Additions to Southwest Regional Williamson County Park.* Hicks & Company, Austin.

Moreman, John A. and Rachel Feit
2002 *Reconnaissance Survey Investigations of the SAWS-ASR Water Transmission Line, Bexar County, Texas.* Hicks & Company, Austin.

Moreman, John A., J. Jarvis, Rachel Feit
2002 *Intensive Archeological Investigations of the Moist Soil Units Project in the Guadalupe Delta Wildlife Management Area in Calhoun County, Texas.* Hicks & Company, Austin.

Karbula, James W., Tim B. Griffith, Jonathan J. Jarvis, Rachel Feit
2001 *A Cultural Resources Assessment of the Proposed State Highway 45.* Hicks & Company, Austin.

Feit, Rachel and Timothy B. Griffith
2001 *Results of Archeological Survey Investigations for the Loop 1 Project Area.* Hicks & Company, Austin.

Kapanday, Diamond, Rachel Feit, James Karbula
2001 *Archeological Survey of Arterial B Proposed Roadway.* Hicks & Company, Austin.

Feit, Rachel and J Andrew Moreman
2000 *An Intensive Survey of the Proposed Site of the Southwest Regional Williamson County Park.* Hicks & Company, Austin.

Feit, Rachel and Timothy Griffith
2000 *A Cultural Resource Survey on the San Gabriel Terrace: Investigations at the Proposed Pecan Branch Wastewater Treatment Plant Property.* Hicks & Company, Austin.

Feit, Rachel and Timothy Griffith
2000 *Results of Survey Investigations for the Proposed Lubbock Storm Sewer in Yellowhouse Draw, Lubbock, Texas.* Hicks & Company, Austin.

Griffith, Timothy B. and Rachel Feit
2000 *A Cultural Resources Assessment of the Proposed Alignment for a New Wastewater Pipeline Along Chandler Creek.* Hicks & Company, Austin.

Seibel Scott, James Karbula, Rachel Feit, Susan Dial, and Chris Caran
2000 *Archeological Investigations along the Clear Fork of the Trinity River: Intensive Survey of the SH 121 Project; Tarrant County, Texas.* Hicks & Company, Austin.

Karbula, James, Scott Seibel, Rachel Feit
1999 *Survey Investigations of the Proposed Maverick County Landfill Site, Eagle Pass Texas* . Hicks & Company, Austin.

Feit, Rachel
1999 *Archeological Survey Investigation at the Rio Hondo Water Treatment Plant, Cameron, Texas*. Hicks & Company, Austin.

Feit, Rachel
1999 *Survey Investigations of the Proposed Extension to Lohman's Crossing Road.* Hicks & Company, Austin.

Feit, Rachel and James W. Karbula
1999 *Survey Investigations along FM 1431 and Cottonwood Creek - Cedar Park, Texas.* Hicks & Company, Austin.

CONFERENCE PRESENTATIONS:

January 2011- "Lost in the Flood: The Effects of Town Planning and Expansion in Austin's Mid-Twentieth Century Urban Neighborhoods." Paper presented at Society for Historical Archaeology Meeting in Austin, Texas.

January 2010- "Under the Kitchen Floor." Paper presented at Society for Historical Archaeology Meeting in Jacksonville, Florida.

January 2008- "A Lotta People Have Histories Here." Paper presented at Society for Historical Archaeology Meeting in Albuquerque, New Mexico.

October 2007- Organized session on African American Archeology in Texas for Texas Archeological Society Meeting in San Antonio, Texas.

April 2007- Organized session entitled *Archaeologies of Urbanism* at the 2007 Society for American Archaeology meeting in Austin, Texas; specific paper delivered entitled "Building the Urban Landscape: the Development of Austin's Infrastructure."

March 2006- "Austin Underground: Archeology of the Capital City's Infrastructure," paper presented at the Spring meeting of the Council of Texas Archeologists in Austin, Texas.

March, 2005- Organized session entitled, the *Archeology of Terán's Forts*; specific paper delivered entitled "Archeology and Architecture at Fort Anahuac" at Texas State Historical Association Meeting.

March 2004- "Building a Fort at Anahuac," paper presented at the Spring meeting of the Council of Texas Archeologists in Austin, Texas.

July 2003- "Preliminary Results of the 2003 Field Season at Anahuac," presentation given upon invitation at the annual Texas Steward's Meeting in Austin, Texas.

June 2003- "Stewardship of What, and By Whom?" Co-authored paper presented at the World Archaeological Congress in Washington, D.C.

October 2000- *Archeology in Guy Town, Austin's Red Light District*- paper presented at the annual Texas Archeological Association Meeting, LaPorte, Texas

PROFESSIONAL MEMBERSHIPS:

Texas Archeological Society (TAS)
Council of Texas Archeologists (CTA), President
Society for Historical Archaeology (SHA)

CERTIFICATIONS / TRAINING:

Registered Professional Archeologist (RPA)
OSHA Trench Safety Training, 2006
Practical Project Development and Environmental Documentation for NEPA compliance, seminar taught by Robert (Jake) Jacobson, March 2000
National Preservation Institute Section 106 seminar, January 2000