

US EPA ARCHIVE DOCUMENT

**BIOLOGICAL ASSESSMENT
FOR
PREVENTION OF SIGNIFICANT DETERIORATION
GREENHOUSE GAS PERMIT APPLICATION
FOR A CLINKER PRODUCTION INCREASE AT THE
CEMEX CONSTRUCTION MATERIALS SOUTH LLC
BALCONES CEMENT PLANT
COMAL COUNTY, TEXAS**

Submitted To:

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ACRONYMS

AOI	area of significant impact
AQRV	air quality related values
AVO	olfactory
BA	biological assessment
BACT	best available control technology
BMP	best management practices
CO	carbon monoxide
dBA	decibels
DLN	Dry Low NO _x
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESL	effects screening level
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency
FHPM	Federal-Aid High Program Manual
FIRM	flood insurance rate map
GAT	Geologic Atlas of Texas
GE	General Electric
GHG	greenhouse gas
HRSG	heat recovery steam generator
LAER	Lowest Achievable Emission Rate
MMPA	Marine Mammal Protection Act
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NH ₃	ammonia
NMFS	National Marine Fisheries Service
NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NSR	New Source Review
NWI	National Wetland Inventory
NWS/AHPS	National Weather Service/Advanced Hydrologic Prediction Service
Pb	lead
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PM _{2.5}	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
ppmv	parts per million by volume, dry basis
PSD	Prevention of Significant Deterioration

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RACT	Reasonably Available Control Technology
SCR	selective catalytic reduction
SIL	significant impact level
SO ₂	sulfur dioxide
TCAA	Texas Clean Air Act
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollutant Discharge Elimination System
TSP	total suspended particulate
TWDB	Texas Water Development Board
TXNDD	Texas Natural Diversity Database
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compounds

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EXECUTIVE SUMMARY

CEMEX Construction Materials South, LLC (CEMEX) owns and operates a cement production plant in New Braunfels, Comal County, Texas. The CEMEX facility consists of two cement kilns, raw and finish mills, clinker coolers, and ancillary material transfer equipment. CEMEX submitted a Prevention of Significant Deterioration (PSD) major modification application for greenhouse gas (GHG) emissions to EPA Region 6 on July 7, 2012 to authorize an increase in Kiln No. 2 clinker production, and to authorize upgrades to the main kiln burners in Kiln No. 1 and Kiln No. 2 to multipath adjustable units. The production increase does not require any physical changes to the kiln system.

The Texas Commission on Environmental Quality (TCEQ) is responsible for issuance of PSD permits for all pollutants that have National Ambient Air Quality Standards (NAAQS). Since the TCEQ has not received PSD delegation for GHG, the U.S. Environmental Protection Agency (EPA) is responsible for issuing GHG PSD permits.

This Biological Assessment (BA), a Federal New Source Review (NSR) requirement, is an evaluation of the associated potential environmental impacts that the proposed project may have on federally-protected species and/or their potential habitat within the potential area of impact. Protected species included in this document are federally-threatened, endangered, and candidate species of Comal County. Habitat evaluations for this BA were accomplished via a pedestrian survey of the proposed site as well as a windshield assessment of publicly accessible areas adjacent to the Action Area. Subsequently, an evaluation of those resources based on air quality modeling results, construction and operational methodologies, and National Pollutant Discharge Elimination System (NPDES) information determined or gathered by Zephyr was accomplished.

Construction for the proposed modification will take place within the existing plant. Proposed construction would only require an upgrade to existing infrastructure and would not require ground disturbing activities.

Federally-listed and other managed species considered in this BA include Black-capped vireo, Golden-cheeked warbler, Sprague's pipit, whooping crane, Peck's cave amphipod, fountain darter, Comal Springs dryopid beetle, Comal Springs riffle beetle, black bear, jaguarundi, red wolf, golden orb, Texas fatmucket, San Marcos salamander, Texas blind salamander, and Texas wild-rice. The habitat evaluation included a pedestrian survey of the existing facility and Action Area. Data were collected to describe resident vegetation communities and assess the potential for occurrence of protected species. Naturally occurring woodlands or other habitat types were not observed within the Action Area. Vegetation was limited to landscaped near the entry of the facility.

To determine the Action Area for this BA, CEMEX performed dispersion modeling of air pollutants that will be emitted as a result of the facility upgrade in accordance with the PSD Permit Air Quality Analysis requirements and TCEQ effects screening level (ESL) analysis

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requirements. This modeling did not indicate any pollutant levels greater than the significant impact level (SIL), so an Action Area defined by the modeled air quality impacts could not be defined beyond the geographic extent of the existing facility.

Construction of the proposed project will have no direct impact on federally-listed species habitat. CEMEX will utilize the best available control technology (BACT) to control emissions and thus minimize impacts to the surrounding environment to the maximum extent practicable. Controls proposed for each pollutant are consistent with both the TCEQ BACT guidance and the most stringent limits in the RACT/BACT/LAER Clearinghouse (RBLC).

Based on the background research described in Section 6.1 and the determinations described in Section 6.4, the proposed project will have no direct or indirect impact on federally-listed species habitat.

This BA provides the results of an evaluation of the potential for the proposed project to impact species within the Action Area that are protected under the Endangered Species Act (ESA). The following table summarizes the recommended effect determination for each federally listed species with the potential to occur within Comal County according to the Annotated County Lists of Rare Species in Comal County from Texas Parks and Wildlife (TPWD) and U.S. Fish and Wildlife Service (USFWS).

Summary of Recommended Determinations of Effect		
Federally-listed Species	Listing/Managing Agency	Recommended Determination of Effect
Black-capped Vireo	USFWS/TPWD	No effect
Golden-cheeked Warbler	USFWS/TPWD	No effect
Sprague's Pipit	USFWS/TPWD	No effect
Whooping Crane	USFWS/TPWD	No effect
Peck's Cave Amphipod	USFWS/TPWD	No effect
Fountain Darter	USFWS/TPWD	No effect
Comal Springs Dryopid Beetle	USFWS/TPWD	No effect
Comal Springs Riffle Beetle	USFWS/TPWD	No effect
Black Bear	USFWS/TPWD	No effect
Jaguarundi	USFWS/TPWD	No effect
Red Wolf	USFWS/TPWD	No effect
Golden Orb	USFWS/TPWD	No effect
Texas Fatmucket	USFWS/TPWD	No effect
San Marcos Salamander	USFWS	No effect
Texas Blind Salamander	USFWS	No effect
Texas Wild-rice	USFWS	No effect

1.0 INTRODUCTION

CEMEX owns and operates a cement production plant in New Braunfels, Comal County, Texas. The CEMEX facility consists of two cement kilns, raw and finish mills, clinker coolers, and ancillary material transfer equipment. CEMEX submitted a PSD major modification application for GHG emissions to EPA Region 6 on July 7, 2012 to authorize an increase in Kiln No. 2 clinker production. Kiln No. 2 is currently limited to 3,600 tons clinker per day (30-day average). CEMEX is proposing a 10% increase in the Kiln No. 2 production to 3,960 tons of clinker per day (30-day average). Kiln No. 2 began initial operation in 2008 and based on operational experience CEMEX believes the kiln can achieve higher production levels than what was originally estimated and permitted. The production increase does not require any physical changes to the kiln system. The project emission increases are summarized in the following table.

NOx tons/yr	VOC tons/yr	CO tons/yr	SO₂ tons/yr	PM tons/yr	PM10 tons/yr	PM2.5 tons/yr	CO2e tons/yr
38.0	2.4	277.0	1.9	10.0	9.8	6.4	841,249.8

The CEMEX plant is currently authorized to use natural gas, coal, and petroleum coke (pet coke) as primary fuels and a long list of both industrial and agriculturally sourced alternative fuels.

Finally, CEMEX proposed to authorize upgrades to the main kiln burners in Kiln No. 1 and Kiln No. 2 to multipath adjustable units. The upgrades consist of adding a channel to allow the use of alternative fuels in the main kiln burners. The burner upgrades will not increase the maximum fuel firing rate for either kiln but will increase flexibility in the amount and kind of fuels that can be burned in the main kiln.

This BA is an evaluation of the associated potential environmental impacts that the proposed project may have on federally-listed species and/or their potential habitat within the potential area of impact.

Protected species included in this document are federally-threatened, endangered, and candidate species. A description of the federal agency regulations for the various protected species evaluated in this BA is presented in Section 2.0.

This BA was developed to investigate, qualify, quantify, and report the possible effects, including: direct and indirect, interdependent and interrelated actions that the proposed project may have on federally-protected species within the Action Area. Habitat evaluations for this BA were accomplished via pedestrian survey of the existing facility. Subsequently, an evaluation of those resources based on air quality modeling results, construction and operational methodologies, and National Pollutant Discharge Elimination System (NPDES) information determined or gathered by Zephyr was accomplished.

Following a study of possible effects to federally listed species, a determination of effect will be stated. Per USFWS guidelines, the three possible determinations as described by USFWS are as follows:

1. No effect - "No effect" means there will be no impacts, positive or negative, to listed or proposed resources. Generally, this means no listed resources will be exposed to action and its environmental consequences. Concurrence from the USFWS is not required.
2. May affect, but is not likely to adversely affect - "May affect, but is not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur. These determinations require written concurrence from the USFWS.
3. May affect, is likely to adversely affect - "May affect, and is likely to adversely affect" means that listed resources are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure.

Note: A finding of "may affect, is likely to adversely affect" by an action agency and the USFWS requires "formal consultation" between the action agency and the USFWS. Formal consultation results in the USFWS issuing a biological opinion as to whether or not the action, as proposed, will jeopardize the continued existence of any listed species.

2.0 FEDERAL AND STATE REGULATIONS

2.1 REGULATIONS AND STANDARDS

2.1.1 Clean Air Act

Both the Federal Clean Air Act (FCAA) and Texas Clean Air Act (TCAA) require that maximum ambient air quality concentration limits be established that are designed to protect public health, welfare and the environment. Ambient air is the air to which the general public has access, as opposed to air within the boundaries of an 'industrial facility.

The FCAA standards are the NAAQS and are established by the EPA. The NAAQS are maximum concentration limits for specific pollutants in ambient air over a specific averaging time as established in the Code of Federal Regulations (40 CFR 50). The NAAQS are classified into two categories: primary and secondary standards. Primary standards are established to protect public health, including "sensitive" populations such as asthmatics, children and the elderly. Secondary standards are established to protect public welfare, including visibility, animals, crops, vegetation and buildings. The FCAA requires periodic review of the standards and the science upon which they are based to assure ongoing protection of the nation's public health and environment. This review is thorough and extensive involving a science policy workshop to identify the key policy-relevant science issues to review, an integrated science assessment which is a comprehensive review, synthesis and evaluation of the science including risk and exposure assessments. Therefore these existing primary and secondary standards represent the current science related to protection of public welfare.

The EPA has established NAAQS for six principal air pollutants, also referred to as criteria air pollutants. These six criteria air pollutants are Carbon Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO₂), Ozone, Particulates (PM_{2.5}, PM₁₀) and Sulfur Dioxide (SO₂). The FCAA also establishes that geographic areas be classified as either having ambient concentrations above or below the established NAAQS. A geographic area whose ambient air concentration for a criteria pollutant is equal to or less than the primary standard is an attainment area. A geographic area with an ambient air concentration greater than the primary standard is a nonattainment area. A geographic area will have a separate designation for each criteria pollutant. Comal County has been designated as attainment or unclassified for all the criteria pollutants.

In addition to NAAQS, the EPA has established PSD increments which limit the increase in the ambient air concentration in an attainment area to an amount (the PSD increment) that will assure that the total ambient concentration in an attainment area continues to be below the NAAQS.

In order to obtain a PSD permit for criteria pollutants, an applicant is required to demonstrate with computer air dispersion modeling that the emissions from their proposed project will not exceed the NAAQS and the PSD Increment for each emitted criteria pollutant. This demonstration is conducted in a two-step process. First the emissions from the new project are

modeled to determine maximum off-property impacts. If those impacts are below a defined SIL for a specific pollutant and averaging period, then the increase in ambient concentration is considered to be insignificant and no further evaluation is required for that pollutant and averaging period. If the project impacts are above the SIL, then additional dispersion modeling is required in which the project emission increases are modeled along with other emissions sources in the area and that predicted impact is added to the background level and compared to the NAAQS and PSD Increment.

The TCEQ is the state agency charged with implementing the Texas Clean Air Act (TCAA) to control air pollution in order to protect human health or welfare, animal life, vegetation or property. To assess and assure that emission increases will be protective of human health, welfare, animal life, vegetation or property the TCEQ has established an effects evaluation process using ESLs for pollutants for which a NAAQS has not been established. This ESL evaluation is implemented through the state permitting process in which computerized dispersion modeling is used to predict the ambient concentration of individual air contaminant species and then are compared to the published ESLs to determine acceptability of the proposed emissions.

ESLs are chemical-specific air concentrations set to protect human health and welfare. Short-term ESLs are based on data concerning acute health effects, the potential for odors to be a nuisance, and effects on vegetation, while long-term ESLs are based on data concerning chronic health and vegetation effects. Health-based ESLs are set below levels where health effects would occur whereas welfare-based ESLs (odor and vegetation) are set based on effect threshold concentrations. The short-term ESL is the lowest value of acute odor, vegetation- and health-based ESLs. The long-term ESL is defined as the lowest value of chronic vegetation- or health-based ESLs. The ESL Published List includes ESLs for thousands of chemicals and can be found at: http://www.tceq.state.tx.us/implementation/tox/esl/list_main.html.

ESLs are not ambient air standards but rather are screening levels used in TCEQ's air permitting process to evaluate the impacts predicted by air dispersion modeling, as described by TCEQ, ESLs 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." Accordingly, if predicted concentrations of a constituent "do not exceed the screening level, adverse health or welfare effects are not expected."

2.1.2 Endangered Species Act

Regulation of the ESA is accomplished by the USFWS. "The purpose of the ESA is to protect and recover imperiled species and the ecosystems on which they depend." Imperiled species specifically includes those listed by the USFWS as threatened or endangered. Candidate species are those "the FWS has enough information to warrant proposing them for listing but is precluded from doing so by higher listing priorities." Candidate species are not specifically protected by the ESA but are included for the purposes of this BA.

Section 7 of the ESA requires Federal agencies to insure that any action authorized, funded or carried out by them is not likely to jeopardize the continued existence of listed species or modify their habitat.

The ESA prohibits the "take" of threatened and endangered species. "Take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." "Harm" is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering."

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3.0 PROJECT DESCRIPTION

3.1 PROJECT PURPOSE

The purpose of this project is to authorize an increase in Kiln No. 2 clinker production. Kiln No. 2 is currently limited to 3,600 tons clinker per day (30-day average). CEMEX is proposing a 10% increase in the Kiln No. 2 production to 3,960 tons of clinker per day (30-day average). Kiln No. 2 began initial operation in 2008 and based on operational experience CEMEX believes the kiln can achieve higher production levels than what was originally estimated and permitted. The production increase does not require any physical changes to the kiln system.

In addition, CEMEX proposes to authorize upgrades to the main kiln burners in Kiln No. 1 and Kiln No. 2 to multipath adjustable units. The upgrades consist of adding a channel to allow the use of alternative fuels in the main kiln burners. The burner upgrades will not increase the maximum fuel firing rate for either kiln but will increase flexibility in the amount and kind of fuels that can be burned in the main kiln.

The proposed project is located within the CEMEX facility located at 2580 Wald Road, New Braunfels, Texas 78132 (Figure 3-1, Appendix A).

3.2 CONSTRUCTION INFORMATION

Construction activities are limited to the burner replacement. This will take place within the existing facility in two existing areas (one at each Kiln). No earth disturbance will be required to install the upgrades to the main kiln burners to multipath adjustable units. The upgrades would improve kiln fuel efficiency; however, CEMEX is not proposing a production increase related to this upgrade.

The projected construction start date is January, 2013. The project will begin operation as soon as the permit is approved.

3.2.1 Construction Activities

The total time estimated to complete the construction of the proposed project is approximately one month and includes the following list of general construction activities.

1. site preparation
2. new tie-ins
3. install interconnecting piping
4. completion of instrumentation and electrical work.

3.2.2 Emission Controls

As required by 30 Texas Administrative Code (TAC) §116.111(a)(2)(c), new or modified facilities must apply BACT, with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility and thereby minimizing the impact of emissions on the ambient air. TCEQ has established BACT guidance by emission source type and the EPA RACT/BACT/LAER Clearinghouse was consulted to determine if any additional controls should be considered. The new facilities associated with this project and their associated emission controls for each pollutant are summarized in below. These performance levels reflect emission control levels consistent with TCEQ guidance and the information available in EPA's RACT/BACT/LAER Clearinghouse database. Section 7.0 (Conclusions) provides specific information on the project emission controls.

3.3 OPERATION AND MAINTENANCE INFORMATION

3.3.1 Operation

The CEMEX facility consists of two cement kilns, raw and finish mills, clinker coolers, and ancillary material transfer equipment. Raw materials (including limestone, sand, gypsum, and various other materials) are mixed and ground in the raw mills and then fed into a rotary kiln. In the kiln, the materials are heated to increasingly higher temperatures as they traverse the length of kiln. The high temperatures create different chemical reactions that transform the raw materials into conglomerated cement known as clinker. The clinker exits the kiln and travels along grates in the clinker cooler until it is cool enough to move to storage or on for further processing. In the finish mills the clinker is ground and additives are integrated to create the final cement product.

Kiln Operation

This is discussed fully in the GHG PSD permit and TCEQ permit applications.

Maintenance/Startup/Shutdown (MSS)

Routine emissions associated with MSS activities will be authorized by CEMEX in a separate permit action.

3.3.2 Water Use

Water is supplied to the facility by a permitted well completed in the Edwards aquifer. The water is used as make up water for the process pond that is used for equipment cooling and process wash down. The proposed upgrades are not expected to result in an increase in current water use which is considerably less than the permitted withdrawal limit.

3.3.3 Noise Effects

The noise from the equipment upgrade and operations may be perceptible to humans and wildlife to some extent immediately adjacent to the facility. Noise levels from project activities should be comparable to noise levels currently from the plant. Little to no effect to wildlife is expected since the noise sources are constant and limited, rather than abrupt and excessive.

3.3.4 Infrastructure-related Effects

There will be no land use impacts from the construction and operation. Any increased noise, dust, and traffic from construction will be short-term for the duration of construction.

3.3.5 Human Activity Effects

Peak construction activities related to the equipment upgrade would only require an addition of approximately 20 workers within the facility. Construction and operation of the proposed project will not require a significant increase of human activity compared to the current, regularly-occurring operational and maintenance activities at the plant. No additional effects to wildlife are expected due to increased human activity from the project.

3.4 WASTEWATER AND STORM WATER INFORMATION

The wastewater discharge from the CEMEX facility is authorized by TPDES Permit No. WQ0002179000. The permit authorizes discharge from the Balcones' Plant storm water settling pond through a controlled weir and into a concrete pipe, thence to Dry Comal Creek, thence to Comal River in Segment No. 1811 of the Guadalupe River Basin. The process water from the plant is recycled through a treatment pond and back into the process. Some process waste water from the truck wash down area may end up in the storm water pond periodically but there is no increase in discharge nor is a change in the quality of water discharged expected as a result of this project.

The Balcones Plant has an Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan and a Storm Water Pollution Prevention Plan currently in place and the facility employees will be trained to implement these plans. These plans will be utilized during operations, and maintenance of the proposed additional combustion sources.

4.0 ACTION AREA

4.1 ACTION AREA DEFINITION

The Action Area is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 C.F.R. 402.02). The analysis of species or designated critical habitat likely to be affected by the proposed project is focused on effects within the project’s Action Area. Both construction and operation phases of the upgraded kiln burners were considered. Possible indirect impacts to surrounding areas include noise, lighting, dust, erosion, stream sedimentation, air emissions, and physical disturbances. Because air emissions have the potential for widest impact away from the project site, the boundary of the Action Area is commonly based on determining a de minimis effects boundary (see Section 2.1.1).

Air-dispersion modeling for this biological assessment indicated that no pollutants emitted as a result of the proposed project would exceed a SIL beyond the geographic extent of the property. Therefore an Action Area based on potential air quality impacts could not be defined beyond the geographic extent of the project site itself (see Figure 4-1, Appendix A). The potential impacts to federally threatened and endangered species and designated critical habitat were evaluated within the identified Action Area. The following sections describe the methodology used to delineate the Action Area for this BA.

4.2 Action Area Definition Methodology

The Action Area is established using air emission dispersion modeling in such a manner as to ensure that any potential impact from emissions beyond the defined boundary of the Action Area would, by regulatory definition, be de minimis.

The boundary of the Action Area is conservatively delineated by using EPA’s SIL for criteria pollutants and “de minimis” levels for noncriteria pollutants. A SIL is established for each NAAQS, at a concentration significantly less than the corresponding NAAQS. By establishing such a de minimis threshold, EPA can ascertain when a potential impact is considered to be so low as to be insignificant.

The boundaries of the Area of Significant Impact (AOI) for a given pollutant and averaging period are defined by the number of modeling receptors for which predicted concentrations are greater than the respective EPA de minimis levels. The Action Area for the biological assessment is the cumulative number of modeling receptors for all pollutants and averaging periods for which predicted concentration are greater than the respective de minimis levels.

4.2.1 Ambient Air Dispersion Modeling

The following is a summary of all of the modeling results of the pollutants submitted for the PSD application. Emissions associated with the proposed project were modeled using the EPA

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AERMOD air dispersion model in support of the state NSR application. Proposed project emission increases were modeled. The Action Area was based on the maximum predicted results from the sources. The ambient air concentration results were then compared with de minimis levels associated with the Primary NAAQS and Secondary NAAQS (Table 4-1). All short term modeling concentrations correspond to the maximum proposed emission rates during normal operations.

All annual modeling concentrations correspond to the proposed annual emission rates. The results of these modeling efforts are summarized in Table 4-1. As the table indicates, the modeling did not indicate any pollutant levels greater than the SIL, so an Action Area defined by the modeled air quality impacts could not be defined beyond the geographic extent of the existing facility. The Action Area is identified on Figure 4-1 (Appendix A).

**TABLE 4-1
AREA OF INTEREST ANALYSIS RESULTS FROM PRELIMINARY MODELING¹**

Pollutant	Averaging Period	NAAQS		TCEQ Property Line Standard ¹	Significant Impact Level (SIL)	AOI Modeling Results	
		Primary	Secondary			Maximum Predicted Concentration	Distance to Furthest Receptor Within Area of Significant Impacts (AOI)
		($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)				
CO	1-Hour	40,000	None	---	2,000	1,043	0
	8-Hour	10,000	None	---	500	440	0
PM ₁₀	24-Hour	150	150	---	5	1.68	0
	Annual	None	None	---	1	0.157	0
PM _{2.5}	24-Hour	35	35	---	1.2	0.256	0
	Annual	15	15	---	0.3	0.024	0

¹There are no TCEQ property line standards for CO, PM₁₀, or PM_{2.5} emissions.

US EPA ARCHIVE DOCUMENT

5.0 EXISTING CONDITIONS

5.1 NATURAL RESOURCES

5.1.1 Regional Setting

The proposed expansion project is located in southeast Comal County along the boundary between the Edwards Plateau and Blackland Prairie Ecoregions of Texas. The Edwards Plateau region is dominated by marine limestones, sandstones and shales deposited when the region was covered by Cretaceous seas (approximately 100 million years ago). Extreme erosion and faults of the Balcones Escarpment formed rolling hills and valleys in the eastern part of the region which becomes progressively flat to the west (TPWD, 2012). The Blackland Prairie is dominated by a low, undulating landscape of clays, marls and limestone which provide productive agricultural soils (TPWD, 2012).

The climate of the Edwards Plateau region is semi-arid with long, hot summers and short, mild winters. Recent average annual rainfall varies from 14 to 35 inches per year and the growing season is approximately 265 days. Elevations in the area county from 600 to 1500 feet above mean sea level and change dramatically across the Balcones Escarpment, a fault zone trending southwest to northeast along the south eastern section of the county. This change in elevation is the locale of dramatic, torrential rains that afflict central Texas.

Vegetation of the Edwards Plateau has changed through time from dominantly grasslands to brushland. Overgrazing and fire control allowed juniper populations to expand into what is now mostly mixed woodlands of ashe juniper, plateau live oak, Texas oak, shin oak and mesquite. Other common vegetation includes yucca, prickly pear, persimmon, sumac species and bumelia which provide habitat, food and cover for local wildlife.

5.1.2 Land Use

In the years before the Civil War, land use throughout Comal County was led by the farming and ranching industry. Through time, the livestock economy and industrial manufacturing expanded and became the leading trades in the county. Production of natural resources such as sand, gravel and limestone persist and ranchers produce cattle, goats, sheep and poultry (TSHA, 2012).

Land use within the Action Area of the proposed expansion site is industrial as listed in Table 5-1 and illustrated in Figure 5-1.

**TABLE 5-1
LAND USE WITHIN THE ACTION AREA**

Land Use	Acres	Percent
Industrial	157.18	100

5.1.3 Topography

Comal County is located in central Texas northeast of Bexar County (San Antonio) along the Interstate 35 corridor. The majority of the county is located within the Hill Country of the Edwards Plateau Ecoregion except for the extreme eastern portion which is in the flatter Blackland Prairie Ecoregion. The eastern prairie elevations range from 600 to 750 feet above mean sea level while elevations in the western hills range from 750 to 1500 feet above mean sea level (TSHA, 2012).

The CEMEX facility is located along the Balcones Escarpment transitional area which trends southwest to northeast. Elevations in this area range from approximately 897 feet in the northeast to 650 feet above mean sea level in the southeast (USGS 7.5 Minute Topographic Maps – New Braunfels West Quadrant).

According to the Federal Emergency Management Agency (FEMA) flood insurance rate map (FIRM) data, the proposed site is located within Zone X – an area of minimal flood hazard above the 500-year floodplain. Areas southwest of the project area are located within the designated 100-year and 500-year floodplains as it is located along Dry Comal Creek (Figure 5-2).

5.1.4 Geology

The Geologic Atlas of Texas (GAT) indicates the region surrounding the CEMEX facility includes Cretaceous Edwards Limestone to the northwest and river terrace deposits to the southeast. The distinct boundary between the Edwards Limestone and the river terrace deposits indicate the abrupt change caused by local, inactive faults of the Balcones Escarpment. The upper beds of Central Texas Edwards Limestone is argillaceous beds of alternating hard and soft fossiliferous units. The lower units are hard, grey to light brown, fine-grained dolostones with chert nodules and common fossils. Terrace deposits are mixtures of gravel, sand, silt and clay deposited along river terraces.

Geologic resources in the area include excavation of limestones, gravels and caliche for use in road construction, building materials and cement manufacturing (USDA Soil Survey, 1984).

The geologic units found within and surrounding the proposed project area are listed and described below in Table 5-2 and illustrated in Figure 5-3.

**TABLE 5-2
GEOLOGIC UNITS SUMMARY**

Map Unit	Formation Name	Description
Qt	Terrace Deposits	Gravel, sand, silt & clay terrace deposits
Qle	Leona Formation	Gravel, sand, silt & clay terrace deposits
Ked	Edwards Limestone	Limestone, dolostone and chert

5.1.5 Soils

Soils of the Blackland Prairie Land Resource Area in Comal County are dominated by deep, moderately well drained clays well suited for pasture grasses and field crops (USDA Soil Survey, 1984). Soils of the Edwards Plateau Land Resource Area are dominated by shallow, rocky clay loams that are well suited for rangeland (USDA Soil Survey, 1984). The NRCS soil units mapped within the proposed project area are listed and described below in Table 5-3 and illustrated in Figure 5-4.

**TABLE 5-3
NRCS SOIL UNITS SUMMARY**

NRCS Map Unit Name	NRCS Unit Characteristics	USDA Classification				NRCS Hydric Soil
		Depth	Drainage	Permeability	Landform	
Branyon clay (ByB)	1-3% slopes, Dark grey to greyish brown	Deep	Moderately well drained	Very slow	Ancient high stream terraces	No
Houston Black gravelly clay (HvD)	Deep, sloping soil on convex ridges in Blackland Prairie	Deep	Moderately well drained	Very slow	Convex Ridges	No
Heiden gravelly clay (HgD)	3-8% slopes, Grey to grey-brown gravelly clay	Deep	Well drained	Very slow	Side slopes of hills and ridges	No
Krum clay (KrB)	1-3% slopes; Dark grey to greyish brown	Deep	Well drained	Moderately slow	Stream terraces and valley fills	No
Pits (Pt)	Excavated material	NA	NA	NA	Quarries	NA

5.1.6 Vegetation

The only vegetation within the Action Area is small areas of maintained/manicured vegetation are located near the entrance of the facility. A few maintained lawn areas can be found within the facility boundary. These are dominated by Bermuda grass (*Cynodon dactylon*) and other ornamental species such as live oak and crape myrtle (*Lagerstroemia indica*) and landscaping bushes.

5.1.7 Water Resources

Water is a prominent resource in Comal County. Several rivers flow through the area including the spring-fed Comal and San Marcos Rivers. Almost the entire county is underlain by the

Edwards Aquifer, approximately half of which constitute recharge and artesian zones along the Balcones Fault Zone (TCEQ, 2012).

Water features near the proposed project site include Dry Comal Creek flowing southwest to northeast into the Guadalupe River at New Braunfels and Four Mile Creek which flows from the south into Dry Comal Creek south of the project location. The USFWS National Wetland Inventory (NWI) data within and immediately adjacent to the Action Area is demonstrated in Figure 5-5.

5.1.8 Climate

Comal County is subject to humid, hot summers and mild, warm winters. In winter, the average temperature is 52°F with lows in the 40's. In summer, the average temperature is 84°F with highs in the high 90's. The average annual precipitation in the region is 33 inches with rare snowfall. The average annual growing season is 265 days. Prevailing winds are from the southeast with an average speed of 105 miles per hour (USDA Soil Survey, 1984). Average humidity is 80 percent in the morning with a lower average humidity of 6 percent in the afternoon.

At the time of this review, the U.S. Drought Monitor indicated the project area is in a severe drought (USDM, 2012), and the Long-Term Palmer Drought Severity Index rates this area as moderate drought, -2 to -2.99 inches of rain (CPC, 2012). According to the National Weather Service/Advanced Hydrologic Prediction Service (NWS/AHPS), the region has received approximately 2.10 inches rain within the 30 days prior to this review. This is the average rainfall for this time of year (NWS/AHPS, 2012).

5.2 FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES OF POTENTIAL OCCURRENCE WITHIN COMAL COUNTY, TEXAS

Table 5-4 shows all species listed by TPWD/USFWS as having the potential to occur in Comal County.

**TABLE 5-4
SPECIES HAVING POTENTIAL TO OCCUR IN COMAL COUNTY**

Common Name	Scientific Name	Federal Status
Black-capped vireo	<i>Vireo atricapilla</i>	Endangered
Golden-cheeked warbler	<i>Setophaga chrysoparia</i>	Endangered
Sprague's pipit	<i>Anthus spragueii</i>	Candidate
Whooping crane	<i>Grus americana</i>	Endangered
Peck's cave amphipod	<i>Stygobromus pecki</i>	Endangered
Fountain darter	<i>Etheostoma fonticola</i>	Endangered

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Common Name	Scientific Name	Federal Status
Comal Springs dryopid beetle	<i>Stygoparnus comlaensis</i>	Endangered
Comal Springs riffle beetle	<i>Heterelmis comalensis</i>	Endangered
Black bear	<i>Ursus americanus</i>	T/SA;NL
Jaguarundi	<i>Herpailurus yaguarondi</i>	Endangered
Red wolf	<i>Canis rufus</i>	Endangered
Golden orb	<i>Quadrula aurea</i>	Candidate
Texas fatmucket	<i>Lampsilis bracteata</i>	Candidate
San Marcos Salamander	<i>Eurycea nana</i>	Threatened
Texas blind salamander	<i>Typhlomolge rathbuni</i>	Endangered
Texas wild-rice	<i>Zizania texana</i>	Endangered

A brief description of each of these species and their habitat requirements are included below.

5.2.1 Black-capped Vireo

The black-capped vireo (BCV) is a small songbird approximately 4.5 inches in length. The back, wings and sides are greenish in color, and the head is either black (in males) or gray (in females). The breast and belly are white and there are white markings around the eyes and the bill (ODWC, 2012). Black-capped vireos feed primarily on insects.

The BCV nests in Texas from April through July, and spend the winter on the western coast of Mexico. Nests are typically built 2-4 feet above the ground in shrubs such as shin oak or sumac. The vireo will return to the same area year after year to nest. The preferred habitat for the black-capped vireo is rangeland with scattered clumps of shrubs separated by open grassland. The black-capped vireo is found throughout the Edwards Plateau and eastern Trans-Pecos regions of Texas (TPWD, 2012). Due to clearing of land, overgrazing and lack of range fires, much of the low growing shrub type habitat preferred by the vireo is in decline.

5.2.2 Golden-cheeked Warbler

The golden-cheeked Warbler (GCWA) is a small, migratory songbird, 4.5 to 5 inches long, with a wingspan of about 8 inches. The male has a black back, throat, and cap; and yellow cheeks with a black stripe through the eye. Females are similar, but less colorful. The lower breast and belly of both sexes are white with black streaks on the flanks (TPWD, 2012).

Typical GCWA nesting habitat is found in tall, closed canopy, dense, mature stands of Ashe juniper mixed with trees such as Texas oak, shin oak, live oak, Lacey oak, post oak, Texas ash, cedar elm, hackberry, bigtooth maple, and sycamore. This type of woodland generally grows in relatively moist areas such as steep-sided canyons, slopes, and adjacent uplands. GCWAs can

also be found in drier, upland juniper-oak (i.e. Texas oak, live oak, post oak, blackjack oak woodlands over flat topography (USFWS, 2012).

5.2.3 Sprague's Pipit

Sprague's pipit is a small non-descript passerine endemic to North American grasslands. Causes of population decline include loss of prairies from cultivation, overgrazing, and invasion by exotic plant species. This small passerine is found in well-drained, open grasslands and fields. Sprague's pipit is a ground feeder relying mainly arthropods, and occasionally seeds as a food source.

It is distinguished from other passerines by the characteristic slender shape, relatively narrow bill, and thin, high-pitched calls and songs of pipits. It is distinguishable from American Pipit (*Anthus rubescens*) by its buffy brown upperparts with broad blackish streaking, yellowish to pale pinkish brown legs, and a dark upper mandible that contrasts with a pale lower mandible.

Pipits currently breed in the native prairie of the Great Plains, including the southern portions of Alberta, Saskatchewan, and Manitoba in Canada, and Montana, North and South Dakota, and Minnesota in the U.S. The breeding range has contracted significantly from historical records, which coincides with the growth of agriculture. It winters in the southern U.S. from Arizona to Mississippi and northern Mexico.

5.2.4 Whooping Crane

At nearly 5 feet (1.5 m) tall, whooping cranes are the tallest birds in North America. They have a wingspan of 7.5 feet (2.3 m). The whooping crane is also one of North America's rarest bird species with fewer than 400 birds remaining in wild population according to a count conducted in July 2010 (USFWS, 2012). Whooping cranes are white with rust-colored patches on top and back of head, lack feathers on both sides of the head, yellow eyes, and long, black legs and bills. Their diet consists of blue crabs, clams, frogs, minnows, rodents, small birds, and berries.

There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, and winters in coastal marshes in Texas at Aransas. The migration corridor for the whooping crane includes Comal County. The cranes winter in the Aransas National Wildlife Refuge approximately 125 miles southeast of the Action Area. There is no habitat for the whooping crane in the Action Area and no documented sightings (TXNDD, 2012).

5.2.5 Peck's Cave Amphipod

The Peck's Cave Amphipod is a small crustacean known only from the Edwards Aquifer. Like most other subterranean amphipods, this species is unpigmented and lacks eyes. Numerous examples of this species have been collected only from the Edwards Aquifer at Comal Springs in Landa Park, New Braunfels, Texas, and a single specimen was taken at Hueco Springs,

Texas in 1992. Specimens of this species were collected near a spring opening following a heavy rain, and an additional specimen was collected from just inside a “cave-like” spring opening under a rock. Nothing is known about the reproduction biology, life history or feeding habits of the Peck’s cave amphipod (TPWD, 2012 Edwards Aquifer Species – Peck’s Cave Amphipod).

Critical habitat was designated for the Peck’s Cave Amphipod by the USFWS on August 16, 2007 in Comal County at Comal Springs and Landa Lake near the city of New Braunfels and Hueco Springs northeast of New Braunfels.

5.2.6 Fountain Darter

The fountain darter is a small fish that is typically 1 to 2 inches in length. These fish are only found in the headwaters of the Comal and San Marcos Rivers. These fish are reddish brown and have specs located on the dorsal fin and dark horizontal lines that run down the sides. These fish also have dark spots located at the base of the tail (TPWD, 2012).

Fountain darters prefer vegetated stream-floor habitats with a constant water temperature. Typically these fish are found within rooted aquatic plants, mosses and algae. Young fountain darters are found in heavily vegetated, backwater areas of the Comal and San Marcos Rivers where there are low water velocities. Adults occur in all suitable habitats, including ripples (TPWD, 2012 Edwards Aquifer Species – Fountain Darter). Fountain darters feed primarily on tiny aquatic crustaceans and mayfly larvae.

Critical habitat was designated for the fountain darter by the USFWS on August 14, 1980 in Hays County from Spring Lake and its outflow on the San Marcos River downstream approximately 0.5 miles below past IH35 near San Marcos, Texas.

5.2.7 Comal Springs Dryopid Beetle

Adult Comal Springs Dryopid Beetles are oblong, slender insects with elongate legs and a length typically around 3 to 4 mm. The cuticle is thin and translucent giving the beetles a reddish-brown color. Larvae are elongate and cylindrical in shape and yellowish-brown in color. Neither the adult or immature stages have eyes (TPWD, 2012).

This species has been collected only from the Edwards Aquifer and associated habitats at Comal Springs, New Braunfels, Texas, and Fern Bank Springs near Wimberley, Texas. Some specimens have been found in the upper spring-runs at Comal Springs, but they are thought to have been flushed from the Aquifer. Adults and larvae of this species have been collected with drift nets placed over the Spring’s sources at Comal Springs and in the upper portions of each springrun. The specific micro-habitat this species inhabits is unknown. However, larvae of other dryopid species are semi-aquatic or terrestrial and the larvae of the Comal Springs dryopid beetle may inhabit the ceilings of the spring openings. These spring openings typically have soil,

roots and debris exposed above the water line that may serve as habitat for the larvae. Adults by comparison are fully aquatic (TPWD, 2012).

The feeding habits of these beetles are unknown as is the life history and reproductive biology. All other dryopid beetles are detritivores and possibly herbivorous. Captive adults have been observed apparently grazing on the surface of rocks (TPWD, 2012).

Critical habitat was designated for the Comal Springs dryopid beetle by USFWS on August 16, 2007. The nearest critical habitat for this species is located at Comal Springs 3.5 miles from the Action Area.

5.2.8 Comal Springs Riffle Beetle

The adult Comal Springs riffle beetle has a narrow body about 2 mm long, and it is reddish-brown in color. The larva has an elongate, tubular body and can be up to 10 mm in length. The Comal Springs riffle beetle is known primarily from Comal Springs where it has been collected from only the primary spring-runs and from up-wellings underlying Landa Lake. A single specimen of this species was taken from the impounded San Marcos Springs, but additional collections of this species have not been made at this location.

The Comal Springs riffle beetle is highly dependent on the constant and narrow range of habitat conditions associated with the springs-flows issuing from the Edwards Aquifer. Larval and adult riffle beetles both feed on microorganisms and debris scraped from the substrate. However, the specific feeding habits of this riffle beetle are unknown (TPWD, 2012 Edwards Aquifer Species – Comal Springs Riffle Beetle).

Critical habitat was designated for the Comal Springs riffle beetle on August 16, 2007. The nearest critical habitat for this species is located at Comal Springs 3.5 miles from the Action Area.

5.2.9 Black Bear

Black bears range from 120-400 lbs with adult males being larger than adult females. Louisiana black bears are primarily inhabitants of bottomland hardwoods and floodplain forests, but also can also be found in upland hardwoods, mixed pine/hardwoods, coastal flatwoods, and marshes.

Females have a litter of 1 to 3 cubs every other winter while denning, and the cubs usually spend their first 1.5 to 2 years with their mother before dispersing. Bears emerge from dens in April and remain active until November, during the summer they eat mostly berries, insects, and carrion. In order to gain weight for the winter, bears eat nuts such as acorns and pecans which are high in carbohydrates and fats. They hibernate in the winter in large hollow trees, downed logs, or in ground nests which are shallow depressions lined with vegetation. Denning bears exhibit varying degrees of awareness, but most can easily be roused if disturbed. Although not

true hibernators, bears generally do not eat, drink, urinate or defecate in winter. They have a unique metabolic process to recycle waste products during winter dormancy.

Habitat loss has been the main reason for the bear's decline. Reservoir construction has flooded many miles of former bottomland hardwood habitat. In addition, many bottomlands forests have been cut and converted to agricultural areas or housing developments.

5.2.10 Jaguarundi

The jaguarundi is a small, short, rusty-brown or charcoal gray cat historically found from Argentina to Arizona. Within the U.S., jaguarundis were most often reported in the brushlands of South Texas where they were reported to hunt for birds and rodents within the dense brush. Generally, jaguarundis are solitary except during the mating season of November and December (USFWS, 1990).

It is generally assumed that jaguarundis are endangered in the U.S. because the dense brush that provided habitat has been cleared for farming or for the growth of cities. The last confirmed of a jaguarundi was in Brownsville in 1986 though there have been many reported sightings in various areas of Texas. There is currently no designated critical habitat for the species.

5.2.11 Red Wolf

A rather small, slender, long-legged wolf resembling the coyote in color but often blackish; typically larger, with wider nose pad, larger feet and coarser pelage; smaller and more tawny than the gray wolf.

Formerly, red wolves ranged throughout the southeastern U.S. but their numbers and range quickly declined under pressure of intensive land use. Also, land management practices allowed the coyote to expand its range east; hybrid offspring of interbreeding red wolves and coyotes more closely resembled coyotes and the genetic identity of the red wolf was gradually lost.

Red wolves inhabited brushy and forested areas, as well as the coastal prairies where they preyed upon rabbits, deer, rodents, prairie chickens, fish and crabs, as well as upon domestic livestock, especially free-ranging pigs.

The red wolf was apparently extinct in the wild by 1980. The last six pure blood red wolves that could be found were captured in southeast Texas and moved to a canine breeding facility. Eventually, after the successful breeding of pure blood red wolves was accomplished, small packs were re-established upon barrier islands of North and South Carolina. Additional re-introduction efforts have occurred with the goal of creating a viable red wolf population large enough so that the red wolf can be removed from the endangered species list.

5.2.12 Golden Orb

The golden orb is a relatively small mollusk reaching at most around 82 mm. This species is yellow-brown or greenish-brown and tan. Current and historic populations are restricted to the Guadalupe, Colorado, and San Antonio and Nueces River systems. The preferred habitat of this species is sand or gravel and is occasionally found on a cobble bottom. This species does not appear to tolerate mud and silt or shifting sands. The golden orb is typically found in rivers and occasionally smaller streams at a depth of typically three meters or less. Although this species is typically found in rivers or streams, some populations have been identified in Lake Corpus Christi. This species has been found alive at only five sites, and none of those locations were within Comal County.

5.2.13 Texas Fatmucket

The Texas fatmucket is a large, elongated mussel that reaches a maximum length of 3.94 inches. The shell is oval to elliptical with a tan or greenish yellow color. This species occurs primarily in moderately sized rivers in mud, sand, or gravel or mixtures of these substrates (USFWS, 2011). Live individuals have been found in relatively shallow water, rarely more than 4.9 feet deep and typically less.

The Texas fatmucket is known to only occur in nine streams within the Colorado and Guadalupe River systems in very limited numbers. All existing populations are represented by only one or two individuals and are likely unstable. None of the remaining populations have been identified within Comal County

5.2.14 San Marcos Salamander

The San Marcos salamander is a small and slender reddish-brown salamander, ranging from 1 to 2.3 inches in length. This species only occurs in Spring Lake and an adjacent downstream portion of the upper San Marcos River located in Hays County. These salamanders only thrive within the clean and clear flowing spring waters from the headwaters of the San Marcos River. This area of Hays County was designated by USFWS as critical habitat for the salamander on August 14, 1980.

5.2.15 Texas Blind Salamander

The Texas blind salamander is a sightless, cave-dwelling salamander that reaches a mature length of about 13 centimeters (5 inches). It is a slender, frail-legged amphibian, white or pinkish in color with translucent skin (USFWS, 2012). The salamander has red external gills used to get oxygen from the water.

The Texas blind salamander is only found in the Edwards Aquifer underneath and near the City of San Marcos (USFWS, 2012). This species is only found above ground when flowing water

from the springs push it to the surface. These salamanders depend on a constant supply of clean, cool water from the Edwards aquifer.

5.2.16 Texas Wild-Rice

Texas wild-rice is a species of aquatic grass. This grass only exists in the spring-fed headwaters of the San Marcos River within the city limits of San Marcos in Hays County. The plant is very habitat specific and is restricted to only a 1.5 mile length of the headwaters (TSHA, 2012). Texas wild rice is a coarse perennial forage plant that grows completely submerged in 0.3 meters to 2.0 meters of clear water of constant temperature, except for the flowering head, which rises 0.3 meter to 0.6 meter above the current. It grows out in the swift current away from banks and quiet waters (TSHA, 2012). This plant will only inhabit clear flowing spring-fed waters.

Critical habitat was designated for Texas wild-rice by USFWS on August 14, 1980 in Hays County.

5.2.17 Natural Diversity Database Results

On August 21, 2012, Zephyr forwarded a request to TPWD to provide Texas Natural Diversity Database information for reports of element occurrence (EO) data (TPWD and USFWS listed-species) within the Action Area and surrounding vicinity. On August 31, 2012, TPWD forwarded ArcGis shapefiles for all reported listed-species for the New Braunfels West USGS quadrangle upon which the CEMEX facility and Action Area are situated. A review of those shapefiles indicates that no federally listed species are located within the Action Area. The fountain darter, Texas blind salamander, and the Comal Springs riffle beetle have been reported within 3.5 miles of the CEMEX facility.

6.0 EFFECTS OF PROPOSED ACTION

6.1 AIR POLLUTION EFFECTS BACKGROUND RESEARCH

Zephyr performed an extensive search for research regarding the potential effects of air emissions on various flora and fauna. The various studies addressed general effects of airborne pollutants, but no research was found that quantified the toxicological effects of air emissions on any of the specific threatened or endangered species addressed in this biological assessment. The search was broadened to include taxonomical equivalents to those protected species occurring within the Action Area. The results of this search were limited to a study of poultry within confined animal feeding operations. The related purpose of the research conducted by Redwine, et.al. (2002) was to characterize particulate matter less than 10 μ m (PM₁₀). A study prepared by Smith and Levenson (1980) resulted in the creation of a screening procedure to assess the potential for air emissions to cause significant impacts on flora and fauna. The study determined that concentrations of airborne pollutants which exceed the screening concentrations may have adverse impacts on plants or animals. This study may be the most applicable of available research to assess the potential to impact the environment. This study is discussed further in the following section.

Another publication (Dudley and Stolton, 1996) summarized that the effects of air pollution on biodiversity, indicate generally, that air pollution has a greater impact on lower life forms such as: lichens, mosses, fungi, and soft-bodied aquatic invertebrates. Impacts to higher life forms are typically linked with food loss and reproductive effects, rather than to direct toxic effects on adults. Possible secondary impacts include acidification, changes in food or nutrient supply, or changes to biodiversity and competition. The study also suggested that plant communities are generally less adaptable to changes in air pollution than animals. However, lower order animals, such as amphibians and fish, are known to be impacted by acidification as a result of the subsequent release of metals into water. Higher order animals often have the ability to move to more favorable conditions.

Possible effects of airborne nitrogen dioxide on aquatic ecosystems include acidification and eutrophication (Lovett and Tear, 2007). Acidification effects water quality by increasing acidity, reducing acid neutralization capacity which results in hypoxia and the mobilization of aluminum. Larger aquatic ecosystems generally have a considerable buffering capacity. Increased acidity may result in increased algal growth by reducing organic carbon which allows increased light penetration and visibility of the water column. Eutrophication of an aquatic system can result from excess algal growth. Decomposition of the excess algae can result in a decrease in dissolved oxygen levels, which can be harmful to many aquatic organisms. Estuaries, bays, and salt marshes are generally not severely impacted by acid deposition than other aquatic ecosystems. However, they are subject to eutrophication caused by increased nitrogen which usually often results in increased plant growth.

6.2 IMPACTS OF AIR POLLUTION ON PLANTS, SOIL, AND ANIMALS

A detailed literature review was conducted to identify any documentation, data, or research of the potential effects of air emissions on flora and fauna and specifically on the threatened and endangered species of potential occurrence in the Action Area. The methods and results of the literature review are presented in Section 6.1.

Guidance from *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals*, EPA 450/2-81-078, December 12, 1980 (*Screening Procedure*) was followed to assess the potential for the project to adversely affect air quality related values (AQRV). *Screening Procedure* provides minimum levels at which adverse effects have been reported in the literature for use as screening concentrations. These screening concentrations can be concentrations of pollutants in ambient air, in soils or in aerial plant tissues. A summary of the *Screening Procedure* requirements follow:

- Estimate the maximum ambient concentrations for averaging times appropriate to the screening concentration for pollutants emitted by the source. Include background concentrations when appropriate
- To determine potential effects from airborne pollutants, check the maximum predicted ambient concentrations against the corresponding AQRV screening concentration, PSD increments or NAAQS – whichever is most restrictive
- To determine potential effects from trace metals, calculate the concentration deposited in the soil from the maximum annual average ambient concentrations assuming all deposited metals are soluble and available for uptake by plants
- Compare the increase in metal concentration in the soil to the existing endogenous concentrations,
- Calculate the amount of trace metal potentially taken up by plants
- Compare the concentrations from Steps 3 and 5 with the corresponding screening concentrations,
- Reevaluate the results of the Step 4 and 6 comparisons using estimated solubilities of elements in the soil recognizing that actual solubilities may vary significantly from the conservatively estimated values
- If ambient concentration modeling results are unavailable, the significant levels for emissions may be used

The particulate matter increases associated with the project are from raw material handling and product handling. There are no emission increases associated with combustion of solid fuels, therefore, no increases in trace metals are expected from the project. Therefore, only Steps 1 and 2 of the *Screening Procedure* guidance were required for this analysis.

The results from the ambient air modeling analyses conducted in support of the PSD and State NSR modeling analysis are summarized in Table 6-1 for pollutants included in *Screening Procedure*. The predicted concentrations were compared with the APRV screening concentrations.

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**TABLE 6-1
SCREENING ANALYSIS – IMPACTS ON PLANTS, SOIL, AND ANIMALS – DIRECT IMPACTS¹**

Pollutant	Averaging Period	Project Sources, Only			Project Sources, Nearby Sources Plus Background Concentration	
		Maximum Predicted Concentration ($\mu\text{g}/\text{m}^3$)	AQRV Screening Concentration ² ($\mu\text{g}/\text{m}^3$)	PSD Class II Increment Consumption ($\mu\text{g}/\text{m}^3$)	Maximum Predicted Concentration ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)
SO ₂	1-Hour	Not Applicable	917	---	Not Applicable	196
	3-Hour	Not Applicable	786	512	Not Applicable	1,300
	24-Hour	Not Applicable	> 18 ⁴	91	Not Applicable	365
	Annual	Not Applicable	18	20	Not Applicable	80
NO ₂	1-Hour	Not Applicable	>3,760 ⁴	---	Not Applicable	188
	4-Hour	Not Applicable	3,760	---	---	---
	8-Hour	Not Applicable	3,760	---	---	---
	1-Month	Not Applicable	564	---	Not Applicable	---
	Annual	Not Applicable	100	---	Not Applicable	100
CO	1-Hour	1,043	>1,800,000 ⁴	---	Not Required ³	40,000
	8-Hour	440	>1,800,000 ⁴	---	Not Required ³	10,000
	1-Week	< 440	1,800,000	---	---	---

¹PSD modeling analysis has not been finalized

²Table 3.1, *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals*, EPA 450/2-81-078, December 12, 1980 – (Smith and Levenson, 1980)

³Project source concentrations are *de minimis* (insignificant) for this pollutant and averaging period. NAAQS modeling was not required.

⁴No AQRV screening value for this averaging period. Conservatively listing the AQRV for the next (longer) averaging period.

Screening Procedure (Smith and Levenson, 1980) states that “no useable information other than that used to develop the ambient standards...was found in the review literature” for total suspended particulate matter (TSP) and “EPA’s current procedure for TSP should suffice for the review of generic TSP.” The EPA’s “current procedure” for TSP review corresponds to demonstrating compliance with the PM₁₀ and PM_{2.5} NAAQS. As discussed in Section 2.2, the Secondary NAAQS were developed to protect “public welfare” which includes effects on soils, water, crops and wildlife. The results from the PM₁₀ and PM_{2.5} NAAQS modeling analysis conducted in support of the PSD modeling analysis are summarized in Table 6-2.

**TABLE 6-2
NAAQS MODELING RESULTS¹**

Pollutant	Averaging Period	Project Sources, Only	Project Sources, Nearby Sources Plus Background Concentration	
		Maximum Predicted Concentration ($\mu\text{g}/\text{m}^3$)	Maximum Predicted Concentration ² ($\mu\text{g}/\text{m}^3$)	NAAQS ³ ($\mu\text{g}/\text{m}^3$)
PM ₁₀	24-Hour	1.68	Not Applicable ¹	150
PM _{2.5}	24-Hour	0.256	Not Applicable ¹	35
	Annual	0.024	Not Applicable ¹	15

¹PSD modeling analysis has not been finalized

²This is a conservative estimate. The background concentrations utilized in the analysis included contributions from existing sources that were included in the modeling analysis (i.e. a double counting of their effects).

³Primary and Secondary NAAQS (have the same value).

The predicted concentrations associated with the proposed project are less than the AQRV screening concentrations, PSD Class II increment consumption concentrations, Primary NAAQS and Secondary NAAQS. Therefore, according to the results of the analysis shown above, the proposed project will not cause significant impacts on soils, water, crops or wildlife.

6.3 CONSTRUCTION EFFECTS

6.3.1 Onsite Habitat Effects

Proposed construction and upgrade activities will not require breaking any new ground within the existing CEMEX facility. Construction efforts will only modify existing infrastructure and will have no effect on habitat.

6.3.2 Noise Effects

The noise from construction may be perceptible to humans and wildlife immediately adjacent to the construction site. Little to no effect to wildlife is expected since the noise sources are limited to just the existing facility. It is not anticipated that noise from the proposed modifications to the existing facility will be any louder than current conditions.

6.3.3 Dust Effects

The proposed construction and modifications to existing infrastructure will not be breaking any new ground and new dust sources are not anticipated from construction. It is anticipated that construction efforts will not require additional heavy machinery or any other large vehicles than what is already located at the facility. Additional dust sources from these vehicles would have no effect. Existing Best Management Practices will be exercised during all construction and mobilization.

6.3.4 Human Activity

Construction and modification to the CEMEX facility will have an increase of roughly 20 additional workers at the peak of activity. This slight increase in human activity will not have any effect to wildlife compared to the regularly-occurring operational and maintenance activities of the existing facility.

6.4 FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES HABITAT EVALUATION

6.4.1 Black-capped Vireo

6.4.1.1 *Potential of Occurrence*

The black-capped vireo nests in Texas from April through July. Nests are typically built 2-4 feet above the ground in shrubs such as shin oak or sumac. The preferred habitat for the black-capped vireo is rangeland with scattered clumps of shrubs separated by open grassland. Although the black-capped vireo is present in portions of the Edwards Plateau, field reconnaissance within the facility did not show a presence of preferred habitat. Most of the trees within the facility were larger mature growth trees and few understory or shrubs ideal for nesting. There are no documented occurrences of the black-capped vireo within or near the Action Area (TXNDD, 2012). It is unlikely that the black-capped vireo would be within the Action Area.

6.4.1.2 *Potential Effect*

As mentioned above, there is no preferred habitat for the black-capped vireo within the Action Area. Due to lack of habitat, neither construction nor operation of the proposed facilities is expected to have any impact on the black-capped vireo directly or indirectly.

6.4.1.3 *Recommended Determination of Effect*

The proposed action will have no effect on the black-capped vireo.

6.4.2 Golden-cheeked Warbler

6.4.2.1 *Potential of Occurrence*

Typical golden-cheeked warbler nesting habitat is found in tall, closed canopy, dense, mature stands of Ashe juniper mixed with trees such as Texas oak, shin oak, live oak, Lacey oak, post oak, Texas ash, cedar elm, hackberry, bigtooth maple, and sycamore. This type of woodland generally grows in relatively moist areas such as steep-sided canyons, slopes, and adjacent uplands.

There are no documented occurrences of the golden-cheeked warbler within the Action Area (TXNDD, 2012). Although the TXNDD did not show presence of this species, further desktop analysis was conducted. A study conducted in August 2008 (Loomis Austin 2008) using The National Land Cover Database (NLCD) and other spatial analysis software identified potential habitat for the golden-cheeked warbler. A review of this study showed the Action Area to be more than 3,500 feet beyond any area modeled to be potential golden-cheeked warbler habitat. During the site visit and field reconnaissance, it did not appear that any potential habitat for this species exists within the Action Area. As mentioned previously, the only vegetation within the Action Area is landscaped maintained areas.

6.4.2.2 Potential Effect

Because of the lack of suitable habitat, lack of documented occurrences, and high human activity from the facility, it would be unlikely that the golden cheeeked warbler would be found within the Action Area or have any potential effect.

6.4.2.3 Recommended Determination of Effect

The proposed action will have no effect on the golden-cheeked warbler.

6.4.3 Sprague's Pipit

6.4.3.1 Potential of Occurrence

Sprague's pipit winters in Texas utilizing large grasslands dominated by native and non-native grass species. In southern Texas, Sprague's Pipits have been located almost exclusively in grass-forb prairie and rarely in shrub grassland. Sprague's Pipits winter in heavily grazed grasslands. Large numbers were also found on former rice fields, that had been re-planted to Bermuda grass (*Cynodon spp.*) a decade or more earlier and heavily grazed (Jones, 2010).

Due to the primarily industrialized land use in the within the Action Area, there are very few habitat areas for most wildlife. None of the habitat types within the Action Area represent those preferred for the Sprague's pipit. There are no documented occurrences of the Sprague's pipit within or near the Action Area (TXNDD, 2012).

6.4.3.2 Potential Effect

As mentioned above, there is no preferred habitat for the Sprague's pipit within any portion of the Action Area. Due to lack of habitat, neither construction nor operation of the proposed facilities is expected to have any impact on the Sprague's pipit.

6.4.3.3 Recommended Determination of Effect

The proposed action will have no effect on Sprague's pipit.

6.4.4 Whooping Crane

6.4.4.1 Potential of Occurrence

Typically, whooping cranes prefer isolated areas away from human activities. The whooping crane migrates between their summer breeding grounds within Wood Buffalo National Park in northern Canada to their wintering grounds in the coastal marshes within and around Aransas National Wildlife Refuge approximately 125 miles southeast of the CEMEX facility.

Critical habitat has been designated at the wintering grounds at and adjacent to the Aransas National Wildlife Refuge. During their 2,500-mile migration, the whooping cranes can make several stops, during which they use a variety of habitats that are generally isolated from human activity. These stopover areas include croplands, grasslands, and wetlands for feeding sites and wetlands and other aquatic features for roosting sites.

The Action Area does not have any preferred habitat for the whooping crane. Furthermore, there are no documented occurrences of the whooping crane within or near the Action Area (TXNDD, 2012).

6.4.4.2 Potential Effect

As mentioned above, the Action Area does not have preferred habitat for the whooping crane and there are no documented occurrences of the whooping crane within or around the Action Area. Due to lack of habitat or sightings, operation of the proposed facilities will not have any impact on the whooping crane directly or indirectly.

6.4.4.3 Recommended Determination of Effect

The proposed action will have no effect on the whooping crane.

6.4.5 Peck's Cave Amphipod

6.4.5.1 Potential of Occurrence

The Peck's cave amphipod is a small crustacean known only from the Edwards Aquifer. Numerous examples of this species have been collected only from the Edwards Aquifer at Comal Springs in Landa Park, New Braunfels, Texas, and a single specimen was taken at Hueco Springs, Texas in 1992. There are no documented occurrences of the Peck's cave amphipod within or near the Action Area (TXNDD, 2012). The Action Area is located over the Edwards Aquifer Transition Zone and is hydrologically downgradient from Comal and Hueco Springs. Due to lack of habitat and no sightings within the Action Area, it is unlikely that this species would be found within the Action Area.

Critical habitat was designated for the Peck's Cave Amphipod by the USFWS on August 16, 2007 in Comal County at Comal Springs near the city of New Braunfels and Hueco Springs northeast of New Braunfels. The Action Area is located approximately 3.5 miles from Comal Springs.

6.4.5.2 *Potential Effect*

As mentioned above, there is no preferred habitat or critical habitat for the Peck's cave amphipod within or near any portion of the Action Area. Due to lack of habitat or sightings, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the Peck's cave amphipod directly or indirectly.

6.4.5.3 *Recommended Determination of Effect*

The proposed action will have no effect on the Peck's cave amphipod.

6.4.6 **Fountain Darter**

6.4.6.1 *Potential of Occurrence*

Fountain darters prefer vegetated stream-floor habitats with a constant water temperature. This species is only found at the headwaters of the Comal and San Marcos River. Typically these fish are found within rooted aquatic plants, mosses and algae. Designated habitat for the fountain darter is located in Hays County from Spring Lake and its outflow, the San Marcos River downstream approximately 0.5 miles past IH35 near San Marcos, Texas. There is no potential for occurrence of the fountain darter within the Action Area. According to the TXNDD records, the fountain darter was last observed in April 1994 in Comal Springs, which is 3.5 miles from the Action Area. There are no documented occurrences of the fountain darter within the Action Area (TXNDD, 2012). The Action Area is located over the Edwards Aquifer Transition Zone and is hydrologically downgradient from the headwaters of the Comal and San Marcos Rivers.

6.4.6.2 *Potential Effect*

As mentioned above, there is no preferred habitat for the fountain darter within any portion of the Action Area. Due to lack of habitat or sightings, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the fountain darter directly or indirectly.

6.4.6.3 *Recommended Determination of Effect*

The proposed action will have no effect on the fountain darter.

6.4.7 Comal Springs Dryopid Beetle

6.4.7.1 *Potential of Occurrence*

This species has been collected only from the Edwards Aquifer and associated habitats at Comal Springs, New Braunfels, Texas, and Fern Bank Springs near Wimberley, Texas. Some specimens have been found in the upper spring-runs at Comal Springs, but they are thought to have been flushed from the Aquifer. Preferred habitat for the Comal Springs dryopid beetle does not exist within the Action Area. There are no documented occurrences of the Comal Springs dryopid beetle within or near the Action Area (TXNDD, 2012). The Action Area is located over the Edwards Aquifer Transition Zone is hydrologically downgradient from the Comal Springs.

Critical habitat was designated for the Comal Springs dryopid beetle by USFWS on August 16, 2007. The nearest critical habitat for this species is located at Comal Springs 3.5 miles from the Action Area.

6.4.7.2 *Potential Effect*

As mentioned above, there is no preferred habitat or critical habitat for the Comal Springs dryopid beetle within or near any portion of the Action Area. Due to lack of habitat, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the Comal Springs dryopid beetle directly or indirectly.

6.4.7.3 *Recommended Determination of Effect*

The proposed action will have no effect on the Comal Springs dryopid beetle.

6.4.8 Comal Springs Riffle Beetle

6.4.8.1 *Potential of Occurrence*

The Comal Springs riffle beetle is known primarily from Comal Springs where it has been collected from only the primary spring-runs and from up-wellings underlying Landa Lake. A single specimen of this species was taken from the impounded San Marcos Springs, but additional collections of this species have not been made at this location. The Comal Springs riffle beetle is highly dependent on the constant and narrow range of habitat conditions associated with the springs-flows issuing from the Edwards Aquifer. Preferred habitat for the Comal Springs riffle beetle does not exist within the Action Area. According to the TXNDD records, the Comal Springs riffle beetle was observed in Comal Springs, which is 3.5 miles from the Action Area, however, no observation date was provided. There are no documented occurrences of the Comal Springs riffle beetle within the Action Area (TXNDD, 2012). The Action Area is located over the Edwards Aquifer Transition Zone is hydrologically downgradient from Comal Springs.

Critical habitat was designated for the Comal Springs riffle beetle by USFWS on August 16, 2007. The nearest critical habitat for this species is located at Comal Springs 3.5 miles from the Action Area.

6.4.8.2 Potential Effect

As mentioned above, there is no preferred habitat or critical habitat for the Comal Springs riffle beetle within or near any portion of the Action Area. Due to lack of habitat, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the Comal Springs riffle beetle directly or indirectly.

6.4.8.3 Recommended Determination of Effect

The proposed action will have no effect on the Comal Springs riffle beetle.

6.4.9 Black Bear

6.4.9.1 Potential of Occurrence

Black bears are primarily inhabitants of bottomland hardwoods and floodplain forests, but also can also be found in upland hardwoods, mixed pine/hardwoods, coastal flatwoods, and marshes. There is no preferred habitat for the black bear within the Action Area. There are no documented occurrences of the black bear within or near the Action Area (TXNDD, 2012).

6.4.9.2 Potential Effect

As mentioned above, there is no preferred habitat for the black bear within the Action Area. Due to lack of habitat, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the black bear directly or indirectly.

6.4.9.3 Recommended Determination of Effect

The proposed action will have no effect on the black bear.

6.4.10 Jaguarundi

6.4.10.1 Potential of Occurrence

The jaguarundi habitat requires very dense continuous brush areas. Due to land use and lack of habitat within the Action Area, there is no potential for occurrence. There are no documented occurrences of the jaguarundi within or near the Action Area (TXNDD, 2012).

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6.4.10.2 Potential Effect

As mentioned above, there is no preferred habitat for the jaguarundi within the Action Area. Due to lack of habitat, or sightings, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the jaguarundi directly or indirectly.

6.4.10.3 Recommended Determination of Effect

The proposed action will have no effect on the jaguarundi.

6.4.11 Red Wolf

6.4.11.1 Potential of Occurrence

The red wolf is extirpated from Texas and there is no potential of occurrence in the Action Area. There are no documented occurrences of the red wolf within or near the Action Area (TXNDD, 2012).

6.4.11.2 Potential Effect

Because the red wolf is extirpated in Texas, neither construction nor air emissions resulting from operation of the proposed facilities will have any impact on the red wolf directly or indirectly.

6.4.11.3 Recommended Determination of Effect

The proposed action will have no effect on the red wolf.

6.4.12 Golden Orb

6.4.12.1 Potential of Occurrence

Current and historic populations are restricted to the Guadalupe, Colorado, and San Antonio and Nueces River systems. The preferred habitat of this species does not exist within the CEMEX boundary. This species has been found alive at only five sites, and none of those locations were within Comal County. There are no documented occurrences of the golden orb within or near the Action Area (TXNDD, 2012).

6.4.12.2 Potential Effect

Due to lack of habitat and no recorded presence, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the golden orb directly or indirectly.

6.4.12.3 *Recommended Determination of Effect*

The proposed action will have no effect on the golden orb.

6.4.13 **Texas Fatmucket**

6.4.13.1 *Potential of Occurrence*

The Texas fatmucket is known to only occur in nine streams within the Colorado and Guadalupe River systems in very limited numbers. All existing populations are represented by only one or two individuals and are likely unstable. The Action Area does not contain the preferred habitat for the Texas fatmucket, and none of the remaining populations have been identified within Comal County. There are no documented occurrences of the golden orb within or near the Action Area (TXNDD, 2012).

6.4.13.2 *Potential Effect*

Due to lack of habitat and no recorded presence, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the Texas fatmucket directly or indirectly.

6.4.13.3 *Recommended Determination of Effect*

The proposed action will have no effect on the Texas fatmucket.

6.4.14 **San Marcos Salamander**

6.4.14.1 *Potential Occurrence*

The San Marcos salamander only occurs in Spring Lake and an adjacent downstream portion of the upper San Marcos River located in Hays County. These salamanders only thrive within the clean and clear flowing spring waters from the headwaters of the San Marcos River. This area of Hays County was designated by USFWS as critical habitat for the salamander on August 14, 1980.

The Action Area does not contain the preferred habitat for the San Marcos salamander. There are no documented occurrences of the San Marcos salamander within or near the Action Area (TXNDD, 2012). Due to lack of habitat, there is no potential for occurrence of this species within the Action Area. The Action Area is located over the Edwards Aquifer Transition Zone and is hydrologically downgradient from the San Marcos River.

6.4.14.2 *Potential Effect*

Due to lack of habitat and no recorded presence, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the San Marcos salamander directly or indirectly.

6.4.14.3 *Recommended Determination of Effect*

The proposed action will have no effect on the San Marcos salamander.

6.4.15 Texas Blind Salamander

6.4.15.1 *Potential occurrence*

The Texas blind salamander is only found in the Edwards Aquifer underneath and near the City of San Marcos (USFWS, 2012). This species is only found above ground when flowing water from the springs push it to the surface. These salamanders depend on a constant supply of clean, cool water from the Edwards aquifer. According to the TXNDD records, the Texas blind salamander was last observed in June 2006 in a private water well 2.84 miles from the Action Area. There are no documented occurrences of the Texas blind salamander within the Action Area (TXNDD, 2012). The Action Area is located over the Edwards Aquifer Transition Zone and is hydrologically downgradient from the San Marcos River.

6.4.15.2 *Potential Effect*

Due to lack of habitat and no recorded presence, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on the Texas blind salamander directly or indirectly.

6.4.15.3 *Recommended Determination of Effect*

The proposed action will have no effect on the Texas blind salamander.

6.4.16 Texas Wild-Rice

6.4.16.1 *Potential Occurrence*

Texas wild-rice is only known to occur at one location on the San Marcos River in Hays County. This species is very habitat specific and grows in spring-fed clean and clear waters. Texas wild-rice has no potential for occurrence within the Action Area. There are no documented occurrences of Texas wild-rice within or near the Action Area (TXNDD, 2012). The Action Area is located over the Edwards Aquifer Transition Zone and is hydrologically downgradient from the San Marcos River.

6.4.16.2 *Potential Effect*

As mentioned above, there is no preferred habitat for Texas wild-rice within the Action Area. Due to lack of habitat, or sightings, neither construction nor air emissions resulting from operation of the proposed facilities are expected to have any impact on Texas wild-rice directly or indirectly.

6.4.16.3 *Recommended Determination of Effect*

The proposed action will have no effect on Texas wild-rice

6.5 DESIGNATED CRITICAL HABITAT ANALYSIS

There is no designated critical habitat for any federally listed threatened or endangered species within the Action Area. Several species have designated critical habitat near New Braunfels and San Marcos. The nearest critical habitat from the Action Area is located approximately 3.5 miles to the east/northeast at Landa Lake and Comal Springs in New Braunfels. The proposed action would have no effect on critical habitat.

7.0 CONCLUSIONS

The proposed facility will utilize appropriate technologies to control emissions and avoid and/or minimize potential impacts to the environment and its associated habitats. The corresponding technologies to be utilized are discussed below.

7.1 DETERMINATION OF EFFECT

The recommended determination of effect for all federally protected species, with the potential to occur within the Action Area is summarized below in Table 7.

Table 7		
SUMMARY OF RECOMMENDED DETERMINATIONS OF EFFECT		
Federally-listed Species	Listing/Managing Agency	Recommended Determination of Effect
Black-capped Vireo	USFWS/TPWD	No effect
Golden-cheeked Warbler	USFWS/TPWD	No effect
Sprague's Pipit	USFWS/TPWD	No effect
Whooping Crane	USFWS/TPWD	No effect
Peck's Cave Amphipod	USFWS/TPWD	No effect
Fountain Darter	USFWS/TPWD	No effect
Comal Springs Dryopid Beetle	USFWS/TPWD	No effect
Comal Springs Riffle Beetle	USFWS/TPWD	No effect
Black Bear	USFWS/TPWD	No effect
Jaguarundi	USFWS/TPWD	No effect
Red Wolf	USFWS/TPWD	No effect
Golden Orb	USFWS/TPWD	No effect
Texas Fatmucket	USFWS/TPWD	No effect
San Marcos Salamander	USFWS	No effect
Texas Blind Salamander	USFWS	No effect
Texas Wild-rice	USFWS	No effect

7.2 POLLUTION CONTROL

7.2.1 Air Emissions

7.2.1.1 *NO_x Emissions*

BACT for NO_x emissions from the cement kilns consists of installation of selected non-catalytic reduction (SNCR) NO_x control systems on the preheater/precalciner kilns. The SNCR process basically consists of the injection of aqueous ammonia in the kiln flue-gas, at a location in the in-line precalciner where the temperature is in the range of 1550°F and 2000°F, which reacts with

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the nitrogen oxides formed in the combustion process to form elemental nitrogen, carbon dioxide, and water.

7.2.1.2 *SO₂ Emissions*

Emissions of SO₂ are dependent on the concentration of pyritic sulfur in the limestone and process conditions. SO₂ control is provided by the alkali absorption inherent in the preheater, precalciner kiln and by the baghouse abatement device's alkali filter cake. The CEMEX Balcones plant currently has one of the lowest permitted lb SO₂/ton clinker emission factors of all cement permits in Texas because of favorable raw material conditions at their plant.

7.2.1.3 *VOC Emissions*

BACT for VOC emissions consists of good combustion practices and combustion unit design. VOC is formed by the incomplete combustion of fuel and from hydrocarbons contained in the raw materials. The low organic compound content of the limestone results in relatively low VOC emissions.

7.2.1.4 *PM/PM₁₀/PM_{2.5} Emissions*

PM, PM₁₀, and PM_{2.5} emissions from the in-line kiln exhausts are controlled with fabric filters.

7.2.1.5 *CO Emissions*

BACT for CO emissions consists of good combustion practices and combustion unit design. CO is formed by the incomplete combustion of fuel, from hydrocarbons contained in the mineral materials that are released during the heating process, and from calcination reactions. Because the limestone used is low in organic carbon, the preheater generates relatively little CO.

BACT for Storage Piles

Storage piles will be controlled with water spray for a 70% reduction in particulate emissions. This meets current TCEQ BACT.

7.2.2 Wastewater and Storm Water

7.2.2.1 *Mitigation of Construction Related Impacts to Surface Water*

Since less than one acre will be disturbed during construction of the proposed additions to the CEMEX facility, there will not be a requirement to obtain a construction storm water permit for the proposed project. However, the storm water pollution prevention plan associated with the Balcones Plant's existing general storm water permit will be followed during the project construction activities as well as during operation of the site. The storm water pollution prevention plan is designed to prevent sediment laden runoff from operational activities.

7.2.2.2 *Mitigation of Operational Impacts to Surface Water*

The Balcones Plant wastewater discharge authorizes discharge from the Balcones' Plant storm water settling pond. The process water from the plant is recycled through a treatment pond and back into the process. The storm water settling pond is designed to retain storm water for a sufficient time to allow solids and sediments to settle out of the water prior to discharge.

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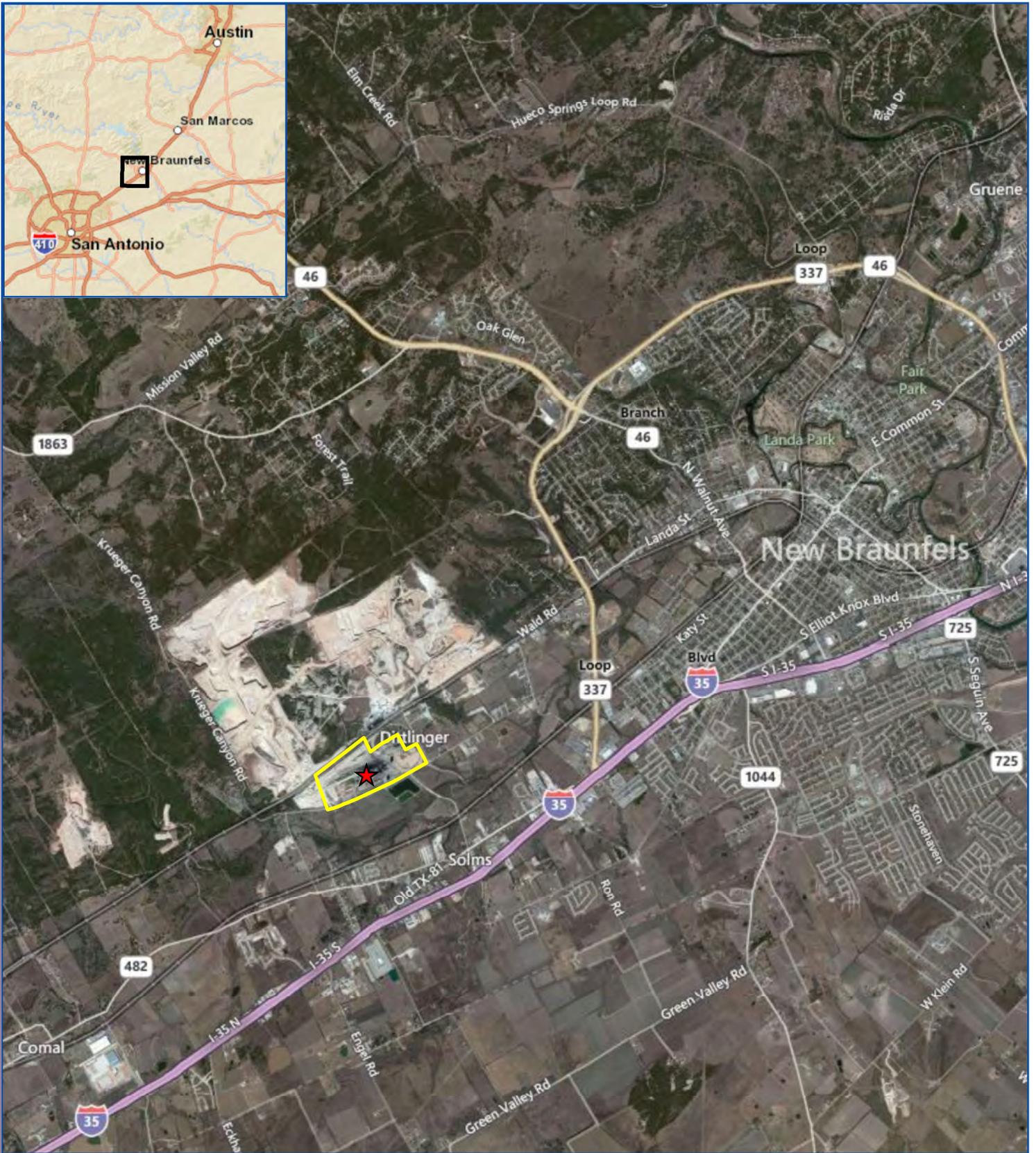
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Appendix A

Figure 3-1

Site Location Map



Data Sources: ESRI-Bing
Hybrid Basemap; Cemex Balcones
Datum: GCS NAD 83
UTM Zone 14

★ Site Location
□ Site Boundary



**FIGURE 3-1
Site Location Map**

CEMEX Balcones - New Braunfels, TX

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Drafted By:
J. Knowles

Reviewed By:
S. McVey

Project No.:
010537

Date:
11.15.2012

Figure 4-1

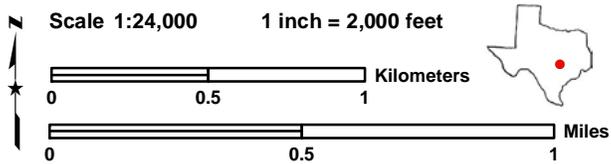
Project Site – Action Area



Data Sources: USGS, ESRI USA
layers and i-cubed imagery.
Datum: GCS NAD 83
UTM Zone 14

★ Site Location

□ Action Area



**FIGURE 4-1
Action Area**

CEMEX Balcones - New Braunfels, TX

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J. Knowles

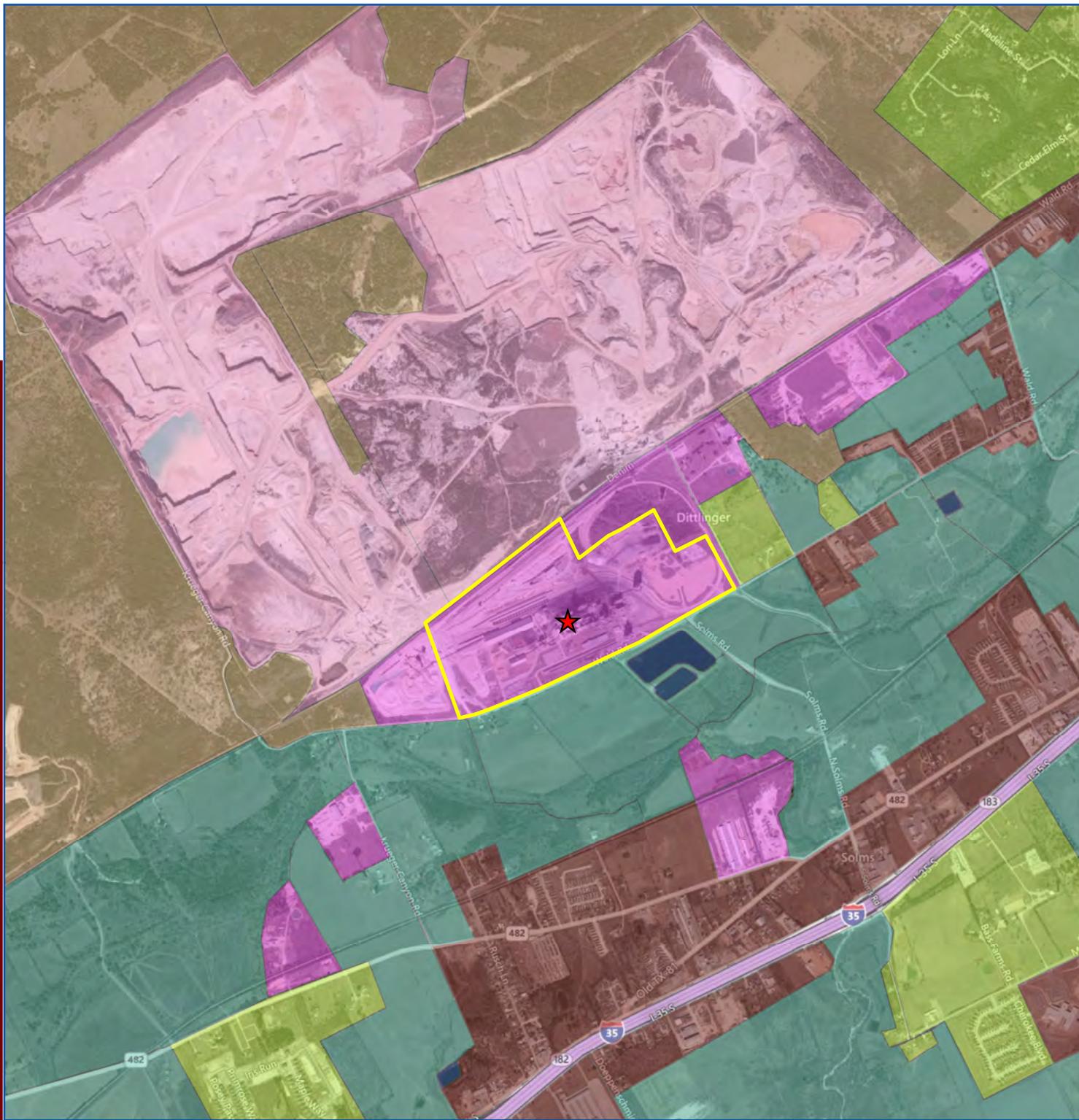
Reviewed By:
S. McVey

Project No.:
010537

Date:
11.15.2012

Figure 5-1

Land Uses



- Site Location
- Action Area
- *LAND USE**
- Cropland and pasture
- Industrial
- Mixed urban / built up land
- Residential
- Retention pond
- Shrub-brushland / rangeland
- Strip mines, quarries and gravel pits

Data Sources: ESRI-Bing Hybrid
 Basemap, Cemex Balcones
 Datum: GCS NAD 83
 UTM Zone 14
 *Land Use determined
 remotely using aerial imagery

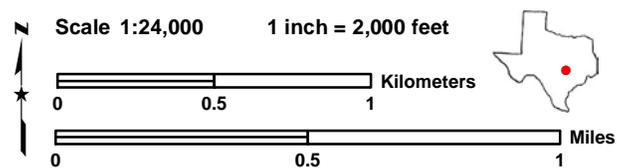
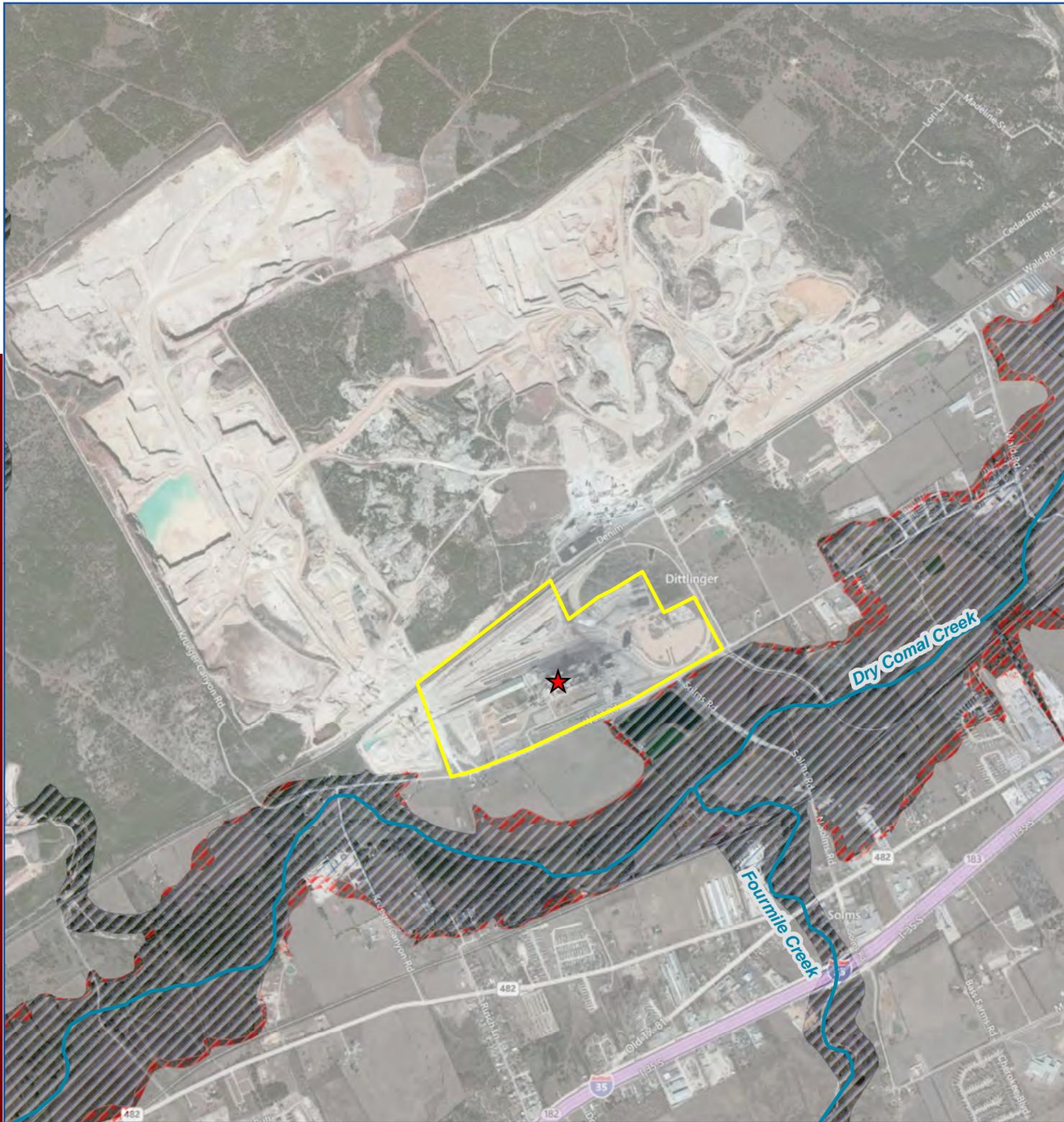


FIGURE 5-1
Land Use / Land Cover
CEMEX Balcones - New Braunfels, TX

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Figure 5-2

FEMA Flood Zone Map



★ Site Location	FEMA Zones
□ Action Area	▨ A- 100-year floodplain
	■ X- Areas outside floodplain
	▨ X500- 500-year floodplain

Data Sources:
 ESRI Bing Maps Hybrid Basemap;
 FEMA Q3 Flood Data.
 Datum: GCS NAD 83

Scale 1:24,000 1 inch = 2,000 feet



**FIGURE 5-2
 FEMA Zones**

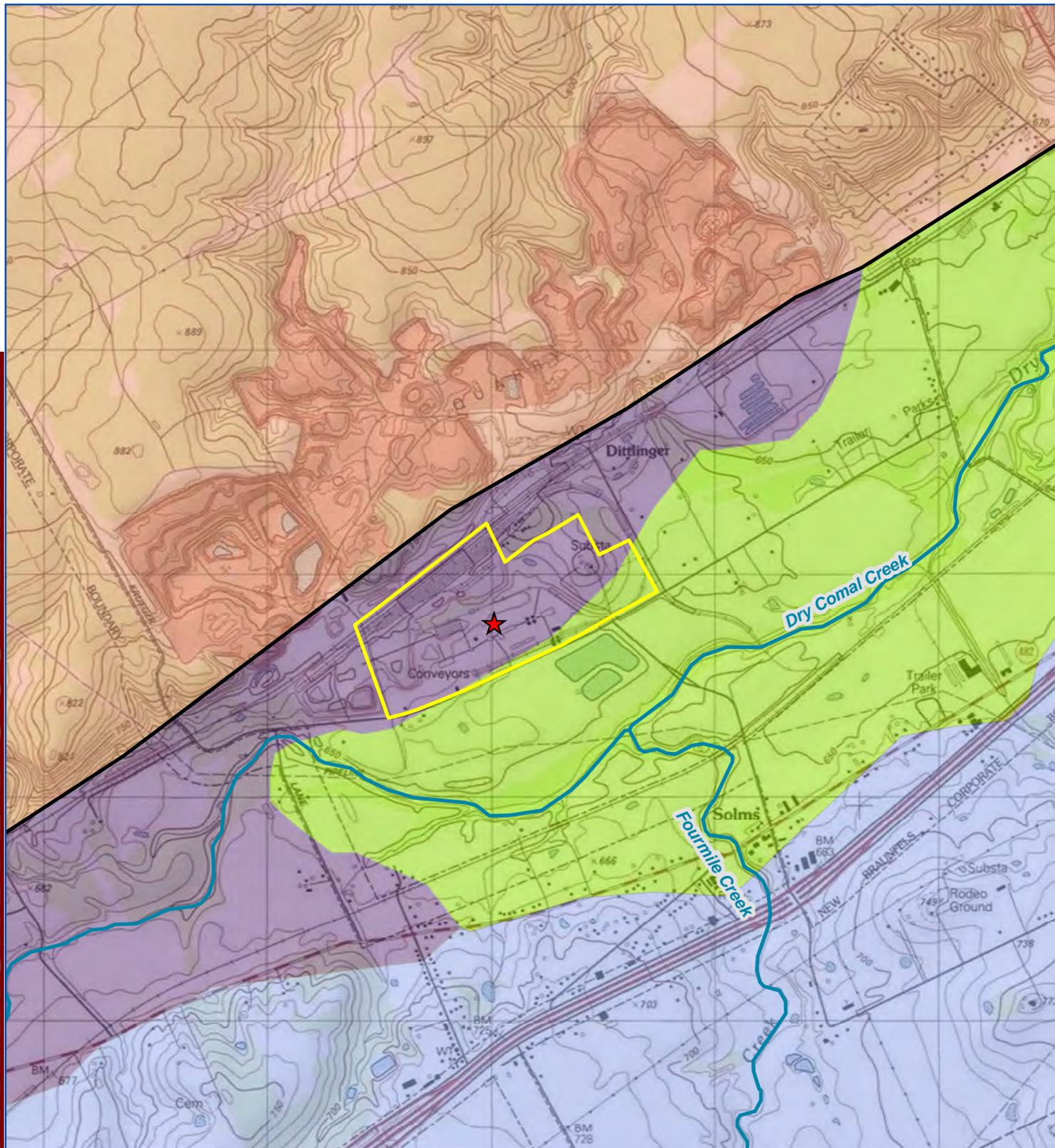
CEMEX Balcones - New Braunfels, TX

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Drafted By: J. Knowles	Reviewed By: S. McVey	Project No.: 010537	Date: 11.15.2012
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Figure 5-3

Geologic Units



- ★ Site Location
- Action Area
- Fault
- Geologic Units
- Qt
- Qle
- Ked
- Kpg

Data Sources:
 ESRI-Bing Maps Hybrid Basemap,
 Geologic Atlas of Texas
 Datum: GCS NAD 83

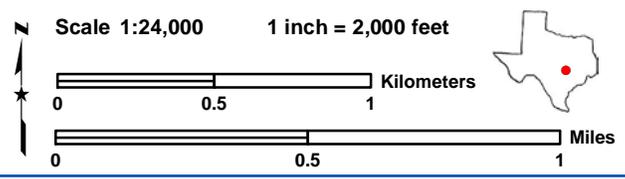


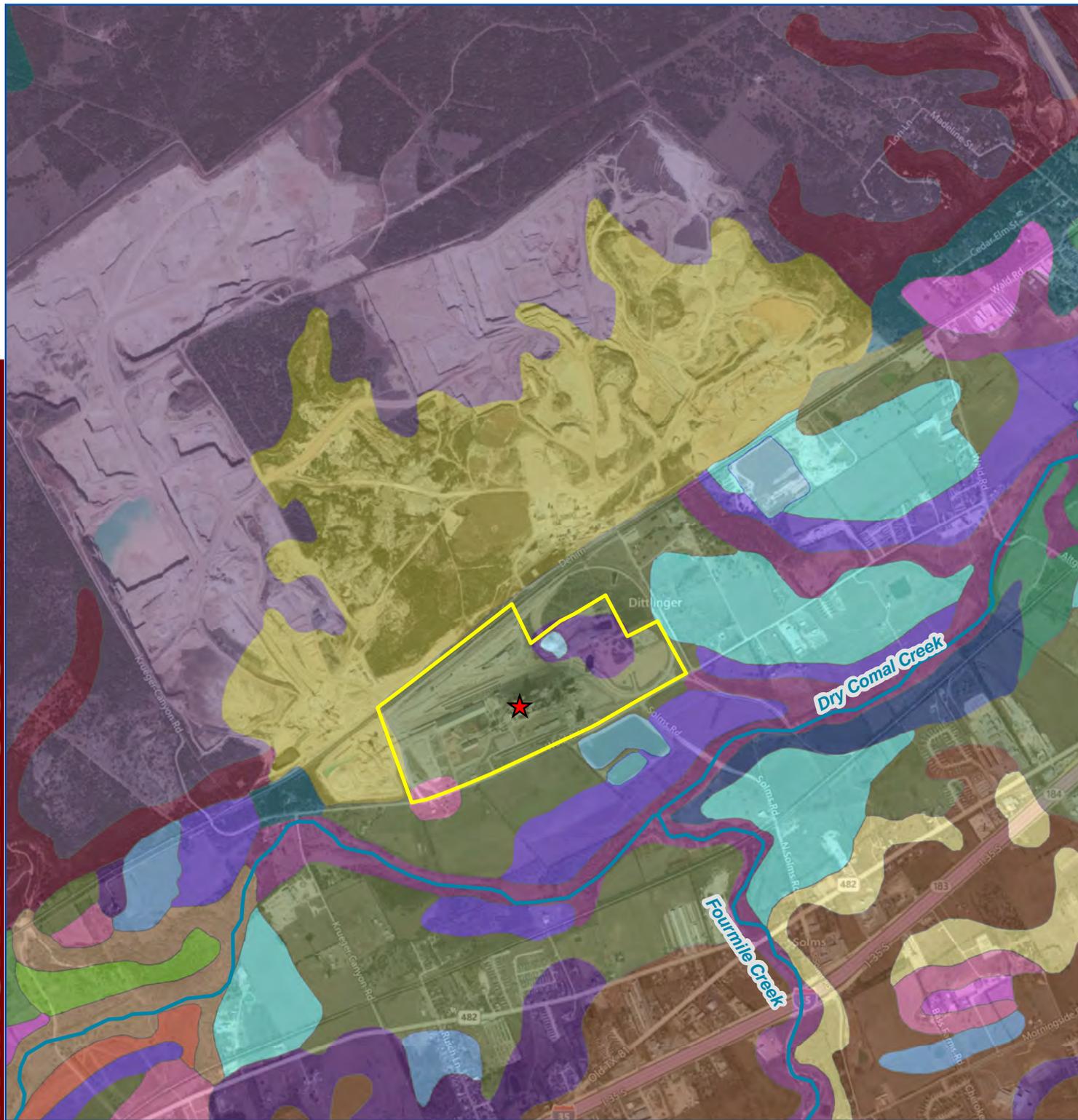
FIGURE 5-3
Geology

CEMEX Balcones - New Braunfels, TX

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Figure 5-4

Soils



Site Location	Soils	ByB	HeD3	KrB	PuC
Action Area	AgC3	CrD	HgD	LeA	RUD
	AnB	ErG	HoB	LeB	SuB
	BrB	HeB	HvB	Or	Tn
	ByA	HeC3	HvD	Pt	W

Data Sources:
 ESRI-Bing Maps Hybrid Basemap,
 NRCS- Soil Data
 Datum: GCS NAD 83

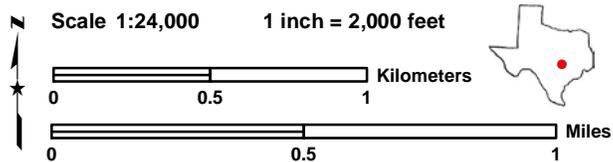
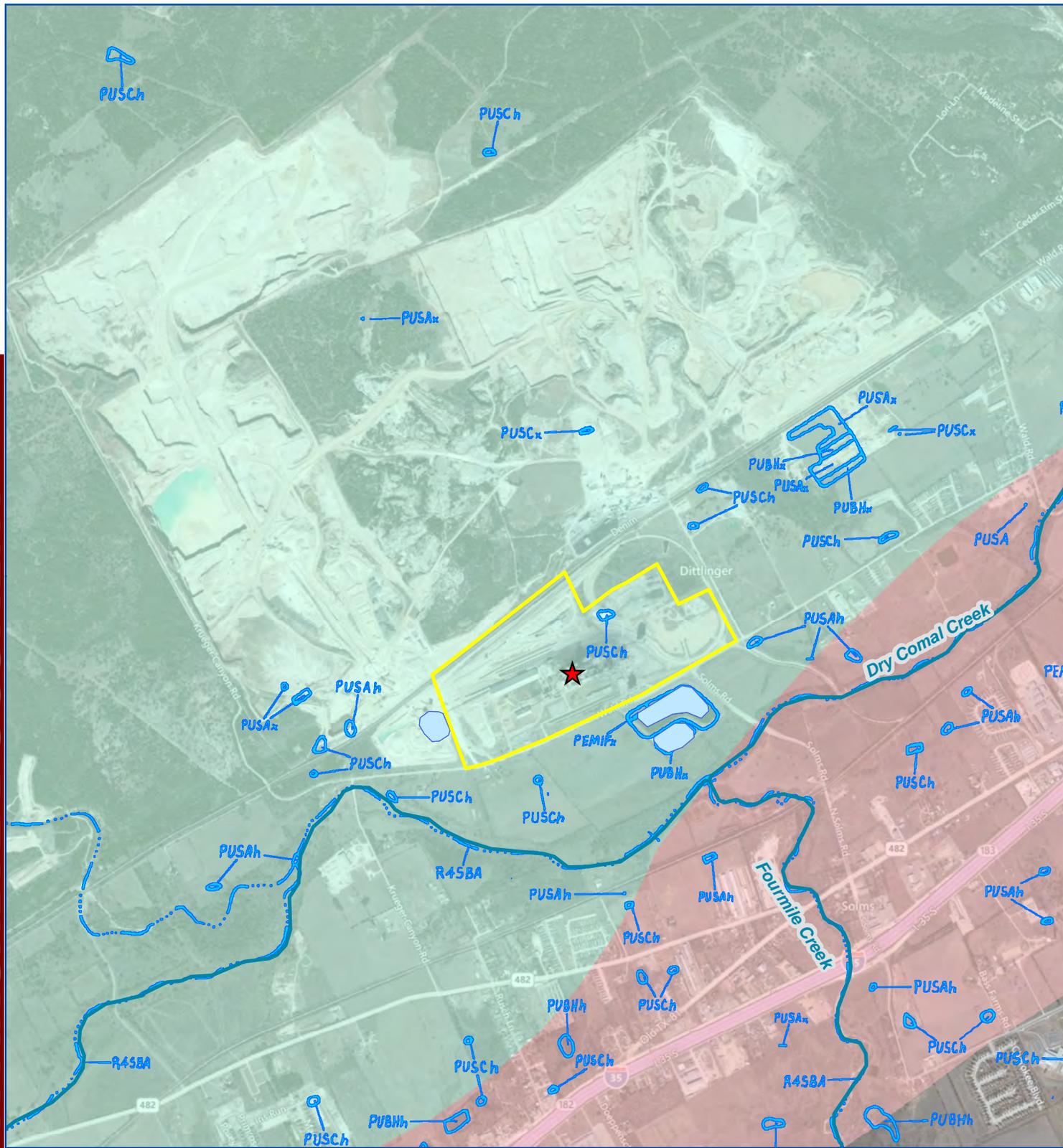


FIGURE 5-4
Soils
CEMEX Balcones - New Braunfels, TX
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 Drafted By: J. Knowles Reviewed By: S. McVey Project No.: 010537 Date: 11.15.2012

Figure 5-5

NWI Data



- ★ Site Location
- Action Area
- Water Features
- Lake/Pond
- Edwards
- NWI Wetlands
- Trinity
- Stream

Data Sources:
 ESRI-Bing Hybrid Basemap &
 Named Streams and Rivers layer,
 National Wetlands Inventory
 Datum: GCS NAD 83

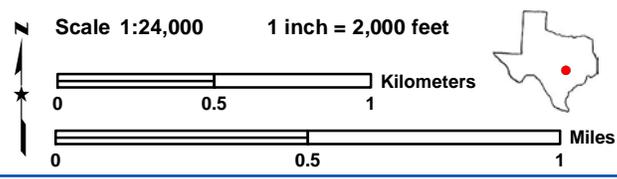


FIGURE 5-5
Water Resources

CEMEX Balcones - New Braunfels, TX

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Drafted By: J. Knowles	Reviewed By: S. McVey	Project No.: 010537	Date: 11.15.2012

Appendix B: Site Photographs

CEMEX entry



Front of CEMEX Facility looking north



Front of CEMEX Facility looking southwest



Front of CEMEX Facility looking west



Inside facility looking northwest



Aerial view of facility looking north



Aerial view of the facility looking north



Aerial view of facility looking northeast settling ponds



Aerial view of the facility looking west



Aerial view of facility looking east



Appendix C: Field Survey Data Summary

Site inspection of CEMEX Action Area
Surveyor: Robert Fisher and Clay Fischer

August 31, 2012

Weather: High temperature 88°F, Average humidity 68%, clear, wind speed 5 - 18 mph, no rain

On August 31, 2012, Zephyr performed a windshield and pedestrian survey of the CEMEX Plant (Action Area). The purpose of the survey was to observe the Action Area and surrounding area to gain further knowledge of the regional setting within the CEMEX Plant. The survey included threatened and endangered species and habitats, land use (Appendix A), and any other sensitive receptors that could be located within the Action Area. Appendix B includes photos and a photo log of the representative areas that were observed.

Bryan Parks with CEMEX was available to take us around the entire CEMEX Plant. We were able to tour everything from the infrastructure to the operations. The Action Area is dominated primarily by industrial operations and office buildings. The entry into the Plant is primarily for parking and office buildings. The remaining portions of the plant are the operations.

FLORA

The only areas of the CEMEX Plant with vegetation are located at the front of the facility near the entry. This vegetation consists primarily of manicured landscaping. These areas are dominated by Bermuda grass, manicured shrubs, several live oaks, and other ornamental species.

TERRESTRIAL FAUNA

As previously mentioned, a majority of the Action Area is industrial operations. There are no portions of the Action Area with natural growing vegetation to provide suitable habitat for a lot of wildlife. The only habitat type within the facility is maintained landscaping dominated by Bermuda grass, ornamental shrubs and trees and other manicured landscapes. Although none of the sensitive species were observed, typical wildlife known to inhabit natural habitat in the region includes:

- Grackles
- White wing dove
- Mourning dove
- Turkey vulture
- American Crow
- Rock pigeon
- Raccoons
- Opossums
- Cottontail rabbit
- Rodents
- Cottonmouth/other snake species
- White-tailed deer
- Six-lined racerunner
- Fence post lizard