

Appendix A
Supplemental Information Report

SUPPLEMENTAL INFORMATION REPORT
LOOP 202 SOUTH MOUNTAIN FREEWAY PROJECT
SPL-2002-00055

INTRODUCTION AND BACKGROUND

The Arizona Department of Transportation (ADOT), in cooperation with Federal Highway Administration (FHWA) and Connect 202 Partners (C202P), is proposing to construct the South Mountain Freeway (SMF), which will complete State Route 202 Loop (SR 202L). The freeway is a 22-mile, eight-lane highway in the southwestern quadrant of the Phoenix Metropolitan area. In 2014, a final environmental impact statement (FEIS) and in 2015 a final record of decision (ROD) were published by FHWA for the SMF Loop 202 project. The U.S. Army Corps of Engineers (Corps) participated in the development of the EIS as a cooperating agency. In November 2016, ADOT applied for a Department of the Army (DA) permit under Section 404 of the Clean Water Act. The application was modified in October 2017.

The Corps is making a permit decision pursuant to Section 404 of the Clean Water Act for discharge of dredged and/or fill material into waters of the United States (WUS). This supplemental information report (SIR) is necessary due to several sources of new information including:

- FEIS Reevaluations
- Clean Air Act General Conformity Rule Review
- Endangered Species change in listing
- Public interest review pursuant to 33 C.F.R. § 320.4(a)(1)
- Public hearing held May 9, 2017
- Corps technical review of hydrology and hydraulics

The objective of this SIR is to determine whether or not the new information or changed circumstances are within the scope and range of effects considered in the original EIS analysis. If the new information or changed conditions are beyond the scope and range of effects considered in the original analysis, the Corps will determine whether the original analysis should be corrected, supplemented, or revised. If new information or changed conditions are within the scope and range of effects considered in the original analysis, the Corps will determine whether a correction of the FEIS is needed.

FEIS REEVALUATIONS

On March 5, 2015, FHWA issued a ROD identifying its selection of the Preferred Alternative identified in the FEIS as the Selected Alternative. To better satisfy the purpose and need of the proposed action and to allow for more specific comparative impact analyses among the alternatives, the study area was divided into a Western Section and Eastern Section (Figure 1). The selected alternatives were the E1 Alternative for the Eastern Section, and the W59 Alternative for the Western Section.

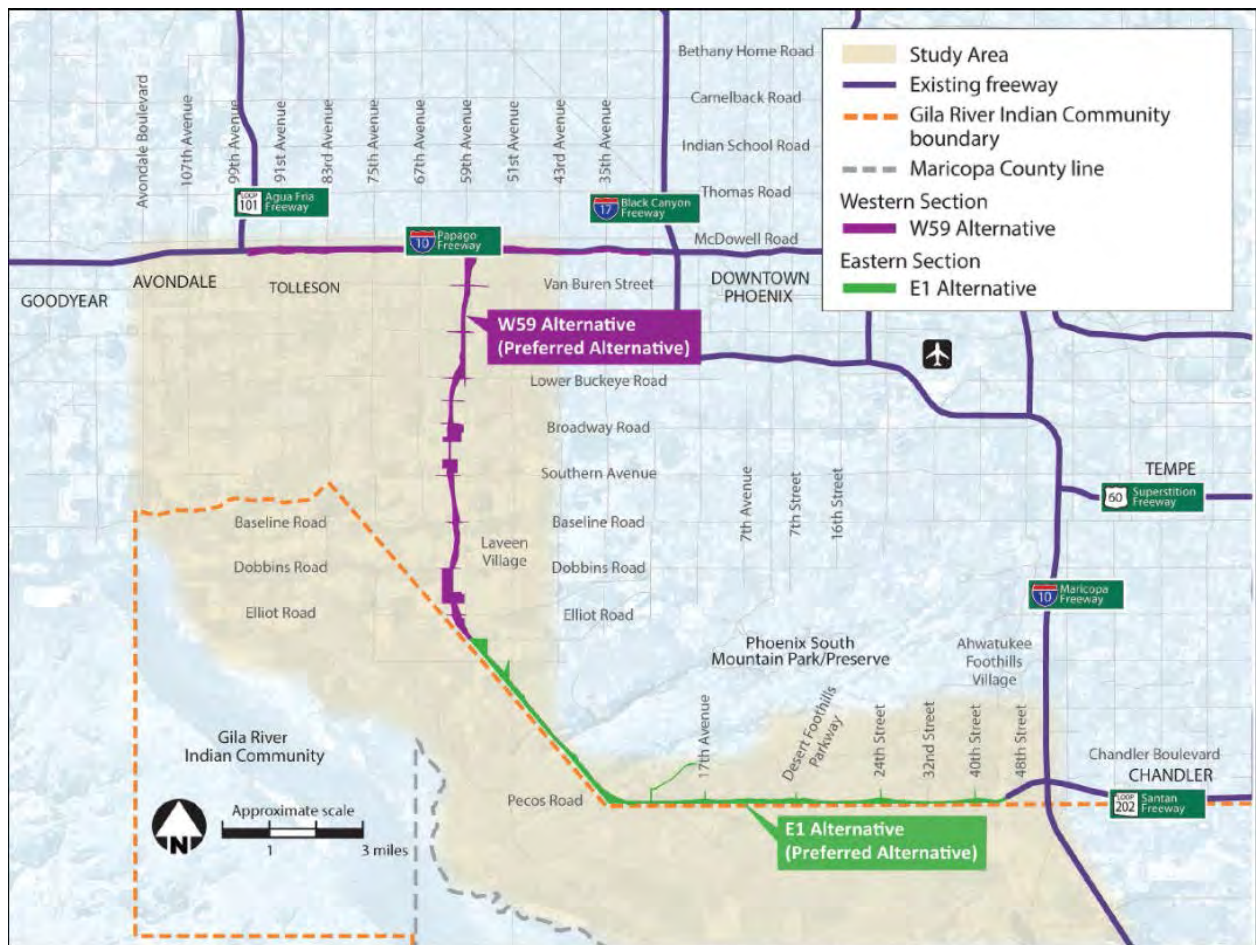


Figure 1. Selected Alternatives from the FEIS.

W59 Alternative

This alternative would start at I-10 (Papago Freeway) at the existing 59th Avenue service traffic interchange, which would be replaced with a system traffic interchange. The alignment would then head south along the eastern side of 59th Avenue to Van Buren Street, where it crosses the Union Pacific railroad (UPRR) tracks would shift to the west side of 59th Avenue. Between Van Buren Street and the Roosevelt Irrigation District Canal (RID) (located between Buckeye Road and Lower Buckeye Road), 59th Avenue would be converted to a two-lane northbound and southbound frontage roads. The freeway alignment would continue south, making a slight shift to the west about 1/3 mile north of Lower Buckeye Road. The freeway would cross Lower Buckeye Road, Broadway Road, the Salt River (a WUS), and Southern Avenue before making a slight shift east. The alignment would continue south, about 1/4 mile west of 59th Avenue, crossing Baseline and Dobbins Roads. Between these two roads, the alignment would cross the Laveen Area Conveyance Channel (LACC), which was identified as a potential a WUS in the preliminary jurisdictional determination (PJD) for the project. After Dobbins Road, the freeway

would make a curve transition to the southeast to cross Elliot Road and connect with the E1 Alternative at the Western/Eastern Section divide on an alignment parallel and adjacent to the Gila River Indian Community (Community) boundary. Service traffic interchange locations would be located at the intersections noted in Figure 2. All interchanges would be full access (ramps in all four directions) except where undesirable operational conflicts may occur. At those interchanges, half access ramps would be constructed. Impacts to the LACC and the Salt River, the only resources presumed to be WUS in this Western Section alternative, would result from the construction of crossing structures such as bridges or culverts.

E1 Alternative

The E1 Alternative would travel from the Eastern/Western Section divide and travel southeast parallel and adjacent to the Community boundary. The alignment would pass through three ridges of the South Mountains before turning east. The alignment would then follow and replace the existing Pecos Road alignment adjacent to the Community boundary and connect to the existing I-10 (Maricopa Freeway)/SR 202L (Santan Freeway)/Pecos Road traffic interchange. All interchanges would be full access (ramps in all four directions). This alternative would impact 49 ephemeral washes that are considered WUS, some of which were previously impacted by the construction of Pecos Road. Impacts from the proposed action would result from the construction or replacement of drainage crossing structures needed for the freeway such as pipes or culverts.

In November 2016, ADOT submitted an application for a permit to discharge fill in WUS to construct and maintain the project. At that time, the project had transitioned to a private-public partnership (P3) Design-Build-Maintain (DBM) approach. The project would be funded using state, federal, and local dollars, and the DBM mechanism would include the involvement of a private group named Connect 202 Partners (C202P) in the final design, construction, and maintenance of the freeway for 30 years. Details of the design had progressed to a sufficient level of detail that the Corps could determine the impacts to WUS and make a permit decision. The Corps considered the proposed action and other alternatives in an analysis to determine compliance with the 404(b)(1) Guidelines. The proposed project was identified as Alternative C-C202P Design. Below is a summary of the activities proposed in WUS; full details can be found in the 404(b)(1) analysis.

Alternative C- C202P, (Developer) Design (proposed project)

Alternative C is also the preferred alternative identified in the FEIS (W59 Alternative in the Western Section and the E1 Alternative in the Eastern Section), but utilizes the design developed by C202P after the project transitioned to a DBM mechanism. Impacts to WUS would result from the construction of culverts and bridges. Forty-nine washes would be impacted by the project, and no drainages would be truncated by the freeway. All WUS would pass through the alignment in their existing configurations. The proposed project consists of four segments, which are not related to the Western and Eastern Sections described in the Selected Alternative

above. The segments are Pecos, Center, Salt River and I-10 Papago (see Figure 2). A shared-use path¹ would be constructed parallel to the freeway along a portion of the Pecos Segment.

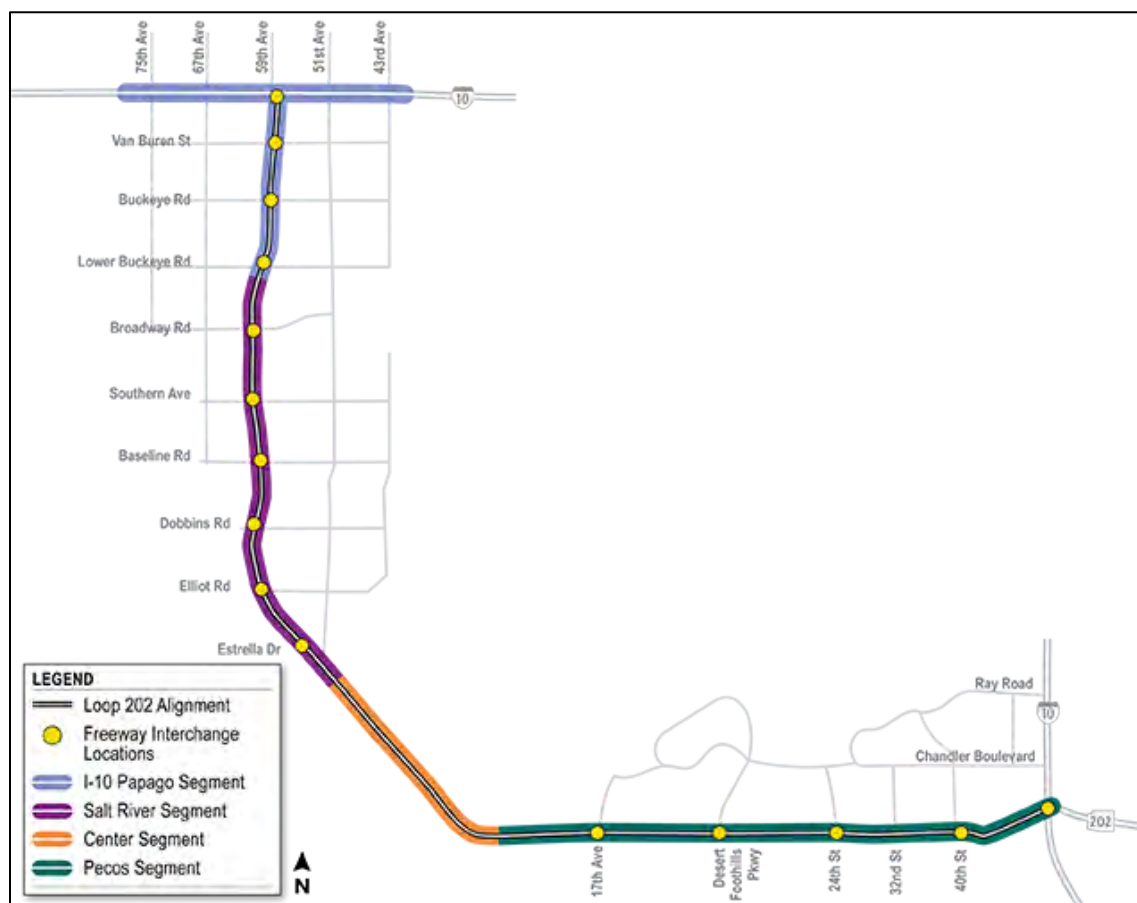


Figure 2. Construction segments of the SMF. Source: www.southmountainfreeway.com

The LACC would pass under the freeway via reinforced concrete box culvert. Sediment removal activities would also occur within the LACC up to 50 feet outside of the project right-of-way (ROW) during initial construction, as requested by the City of Phoenix.

¹ The 1999 American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities defines a shared-use path as being physically separated from motor vehicular traffic with an open space or barrier. A shared-use path serves as part of a transportation circulation system and supports multiple recreation opportunities, such as walking, bicycling, and inline skating. A shared-use path typically has a surface that is asphalt, concrete, or firmly packed crushed aggregate. Shared-use paths should always be designed to include pedestrians even if the primary anticipated users are bicyclists.

Two bridges would be constructed across the Salt River measuring 2,660 feet in length. A total of 6 piers would be located in WUS for the bridges. Scour protection aprons around each pier would also be constructed to protect the structure from erosion.

Alternative C would result in 5.829 acres of permanent impacts to WUS and 7.130 acres of temporary impacts. None of the temporary impacts would last more than twelve months. The total estimated cost of work within WUS associated with construction would be \$106 million.

Proposed Maintenance Activities

Maintenance activities would include the repair, rehabilitation, removal, or replacement of structures, sediment and debris removal, erosion repair, and placement of temporary fills to complete maintenance work. Maintenance activities would be restricted to the project's ROW or permanent drainage easement associated with the SMF, and would allow deviations in the permanently impacted area up to 0.03 acre. Deviations include those due to changes in materials, construction techniques, requirements of other regulatory agencies, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, removal, or replacement.

FEIS Reevaluations

In the time since the original 2015 FHWA ROD issuance, six FEIS/ROD reevaluations were conducted by ADOT and FHWA to consider modifications that have occurred with the proposed project. These changes were associated with design refinements, geotechnical investigations, residential and business relocations, and the transition of the project to DBM implementation approach. The DBM approach would include the involvement of C202P in the final design, construction, and maintenance of the freeway for 30 years. The Corps considered the following reevaluations (also found in Appendix A) in making its decision since they involved areas where WUS were located and activities that were being considered by the Corps:

- Reevaluation #2, which considered the addition of 'remainder parcels' to the project ROW. Remainder parcels are defined as "land outside of the ROW footprint analyzed in the FEIS/ROD. In most cases, only part of a parcel was needed for the project, but the part of the parcel not needed for the project was acquired because the land was no longer economically viable for the owner or the costs to remedy the damages to the value of the remainder parcel was greater than the cost of the remainder parcel itself..."
- Reevaluation #5, which considered the addition of new ROW, temporary construction easement (TCE), and perpetual drainage easement to the project area. TCE's would grant ADOT the rights to occupy the land during construction but would expire when the project is finished. Perpetual drainage easement would provide ADOT the right to construct drainage conveyances and the right to access and maintain those conveyances

after the project is completed. Potential WUS were identified in some of these parcels in a PJD issued by the Corps in November 2016. The reevaluation found that the modification would result in a change in the affected environment and environmental impact for WUS. However, the change in impacts were categorized as temporary and not substantially different than the Selected Alternative.

- Reevaluation #6, which considered the addition of two parcels of new TCE within the Salt River channel that are needed to construct the Salt River bridges. Potential WUS were identified in these parcels in a PJD issued by the Corps in October 2017. Activities within the TCE's would be temporary, and no increase in permanent impacts would occur. After construction, the TCE's would expire and not subject to routine maintenance activities. The reevaluation found that the modification would result in a change in the affected environment and the environmental impacts. However, as with Reevaluation #5, the change in impacts were categorized as temporary and not substantially different than the Selected Alternative.

These reevaluations considered the impacts to various resource categories resulting from the modifications and whether a supplemental EIS was warranted to consider the change in scope and the impacts associated with the modifications. The reevaluations determined that the proposed action would not significantly change as a result of the modifications. In addition, it was determined that the original environmental document remains valid for the proposed action, and that no substantial changes occurred in the social, economic, or environmental impacts of the proposed action that would substantially impact the quality of the human, socioeconomic, or natural environment.

CLEAN AIR ACT (CAA) GENERAL CONFORMITY RULE REVIEW

Introduction

Section 176(c) of the Clean Air Act (CAA; 42 U.S.C. § 7506(c)) requires federal agencies that license, permit or approve any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) before the action is approved. In this context, "conformity" requires that federal actions be consistent with the objective of SIPs to eliminate or reduce the severity and number of violations of the National Ambient Air Quality Standards (NAAQS), and CAA section 176(c)(1), "Limitation on Certain Federal Assistance," mandates that the federal government not engage, support, or provide financial assistance for licensing or permitting, or approving any activity that does not conform to an approved CAA implementation plan.

Section 176(c)(1) further defines conformity as the upholding of "an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving attainment of such standards." Conforming activities or actions should not, through additional air pollutant emissions:

- Cause or contribute to new violations of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS; or
- Delay timely attainment of any NAAQS or interim emission reductions.

The United States Environmental Protection Agency (USEPA) promulgated revised general conformity regulations effective July 6, 2010. The general conformity regulations are found in Title 40 of the Code of Federal Regulations (C.F.R.) at Part 93, Subpart B, "Determining Conformity of General Federal Actions to State or Federal Implementation Plans." The general conformity regulations require a general conformity determination for all federal actions in NAAQS nonattainment or maintenance areas where the total direct and indirect emissions of the relevant criteria pollutants and precursor pollutants caused by the federal action equal or exceed certain *applicability rates*, as established by the USEPA regulations.²

The general conformity regulations provide a step-by-step process, which begins with an applicability analysis. That is, before any approval for a federal action can be provided, the regulating federal agency must evaluate whether, on a pollutant-by-pollutant basis, a general conformity determination is required. The applicability analysis can be (but is not required to be) completed concurrently with any analysis required by the National Environmental Policy Act (NEPA). If the general conformity regulations are found to apply to the federal action, the regulating federal agency must next conduct a conformity evaluation, issue a draft determination for public review, and then publish the final determination.

Description of the Federal Action

Project Background

ADOT applied to the Corps for a CWA section 404 permit in conjunction with the construction of infrastructure components needed to facilitate implementation of Alternative C. (CWA; 33 U.S.C. §§ 1251-1387) Specifically, the infrastructure associated with Alternative C (*e.g.*, bridges, road crossing culverts, bank stabilization, *etc.*) would result in discharges of dredged or fill material into WUS under the CWA. Therefore, the federal action requested from the Corps consisted of the issuance of an individual CWA section 404 permit to authorize construction and maintenance of such infrastructure.

The proposed federal action assessed for general conformity is the portion of the Alternative C, the proposed project, that involves the Corps' issuance of a CWA section 404 permit for discharges of dredged or fill material into WUS.

² By requiring an analysis of direct and indirect emissions, USEPA intends for federal agencies to account for emissions that are reasonably foreseeable and which agencies can practicably control.

General Project Description

ADOT proposes to construct and/or install, and maintain the regulated infrastructure listed in Table 1:

Table 1 – Construction Activities in WUS

Count	Wash Name and Number	Existing Structure ^A	Primary Construction Activities	Proposed Structure ²	Inlet Protection	Outlet Protection
1	Wash 1 (W1)	4-10'x7'x149' CBC	Remove existing culvert and construct new culvert with inlet and outlet concrete aprons, riprap outlet protection, and channel grading.	4-10'x5'x44' 9' RCBC	36'x71' concrete apron	22'x60' concrete apron; 28'x75' riprap
2	Constructed Channel 1 (C1)	3-8'x4'x121' CBC	Remove existing culvert and construct new culvert with inlet and outlet concrete aprons and riprap outlet protection.	4-10'x4'x21' 5' RCBC	25'x56' concrete apron	13'x50' concrete apron; 55'x88' riprap
3	Constructed Channel 3 (C3)	6-10'x5'x133' CBC	Construct new culvert north of existing culvert with inlet and outlet concrete aprons and riprap outlet protection.	6-10'x5'x21' 5' RCBC	10'x85' concrete apron	15'x90' concrete apron; 31'x77' riprap
4	Constructed Channel 4 (C4)	3-81"x59"x120' CMPA	Remove existing culvert and construct concrete-lined channel and 2 new culverts, one with concrete inlet apron, and the other with concrete outlet apron and riprap outlet protection.	49'x1,438' CC; 3-10'x6'x37' RCBC; 3-10'x6'x23' 6' RCBC	10'x45' concrete apron	21'x52' concrete apron; 37'x52' riprap
5	Wash 2 (W2)	2-87"x63"x120' CMPA	Remove existing culvert and construct new concrete-lined channel, CHDPEPP, and culvert with concrete outlet apron and riprap outlet protection.	52'x564' CC; 18"x44' CHDPEPP; 2-10'x5'x23' 2' RCBC;	N/A	15'x32' concrete apron; 97'x20' riprap

Table 1 – Construction Activities in WUS

Count	Wash Name and Number	Existing Structure ^A	Primary Construction Activities	Proposed Structure ²	Inlet Protection	Outlet Protection
6	Constructed Channel 5 (C5)	2-81"x59"x164' CMPA	Remove existing culvert and construct new culvert with inlet and outlet concrete aprons and riprap outlet protection.	3-72"x253' RCP	61'x50' concrete apron	22'x50' concrete apron; 34'x44' riprap
7	Wash 3 (W3)	3-96"x138' CMP	Remove existing culvert and construct new culvert with outlet riprap energy dissipater.	2-12'x8'x51' 8' RCBC	N/A	77'x85' riprap energy dissipator
8	Wash 4 (W4)	1-78"x214' CMP	Remove existing culvert and construct new culvert with riprap outlet protection.	1-8'x6'x372' RCBC	N/A	35'x85' riprap
9	Wash 5 (W5)	2-78"x170' CSP	Small animal crossing. Remove existing CSP and construct new culvert with inlet channel grading, grouted riprap inlet protection, and grouted riprap outlet protection. culvert floors lined with 4" of non-shrink grout covered with 8" of natural substrate.	2-72"x330' CMP (Small Animal Crossing)	20'x41' grouted riprap	20'x37' grouted riprap
10	Constructed Channel 6 (C6)	5-90"x196' CMP	Remove existing culvert and construct new culvert with inlet and outlet concrete aprons and riprap outlet protection.	4-10'x7'x22' 2' RCBC	20'x56' concrete apron	19'x49' concrete apron; 35'x60' riprap
11	Wash 43 (W43)	3-24"x136' CMP	Remove existing culvert and construct new culvert with riprap inlet and outlet protection and outlet channel grading.	2-36"x361' RCP	34'x40' riprap	10'x40' riprap

Table 1 – Construction Activities in WUS

Count	Wash Name and Number	Existing Structure ^A	Primary Construction Activities	Proposed Structure ²	Inlet Protection	Outlet Protection
12	Truncated Wash West (T2)	1-18"x153' CMP	Remove existing culvert and construct new culvert with riprap outlet protection and channel grading.	1-24"x321' RCP	N/A	8'x24' riprap
13	Wash 44 (W44)	1-18"x142' RCP	Remove existing culvert and construct new culvert with inlet channel grading, outlet riprap protection, and outlet channel grading.	1-30"x280' RCP	N/A	10'x19' riprap
14	Wash 6 (W6)	N/A	Concrete channel to redirect flows to W7.	20'x363' CC	N/A	N/A
15	Wash 7 (W7)	1-8'x4'x145' CBC	Remove existing culvert and construct new culvert with inlet concrete channel lining and riprap protection, concrete outlet apron and riprap outlet protection, and channel grading.	1-10'x6'x320' RCBC	10'x20' riprap; 22'x58' concrete channel	16'x34' concrete apron; 25'x63' riprap
16	Wash 8 (W8)	1-8'x4'x141' RCBC	Small animal crossing. Remove existing culvert and construct new culvert with grouted riprap inlet and outlet protection and outlet channel grading. culvert floor and grouted riprap covered with 12" of natural substrate.	1-10'x6'x243' RCBC (Small Animal Crossing)	62'x28' grouted riprap	24'x53' grouted riprap
17	Wash 9 (W9)	1-8'x4'x136' CBC	Remove existing culvert and construct new culvert with inlet and outlet concrete aprons, riprap protection, and channel grading.	1-10'x5'x254' RCBC	2-10'x18' riprap; 17'x28' concrete apron	18'x24' concrete apron; 20'x54' riprap

Table 1 – Construction Activities in WUS

Count	Wash Name and Number	Existing Structure ^A	Primary Construction Activities	Proposed Structure ²	Inlet Protection	Outlet Protection
18	Wash 10 (W10)	1-8'x4'x167' CBC	Remove existing culvert and construct new culvert with inlet and outlet concrete aprons, riprap protection, and channel grading.	1-6'x6'x286' RCBC	10'x18' riprap; 19'x32' concrete apron	16'x31' concrete apron; 24'x62' riprap
19	Wash 11 (W11)	1-24"x165' RCP	Remove existing culvert and construct new culvert with inlet and outlet concrete aprons, riprap protection, and channel grading.	1-10'x6'x246' RCBC	10'x28' riprap; 19'x34' concrete apron	18'x33' concrete apron; 24'x64' riprap
20	Wash 12 (W12)	2-24"x154' RCP	Remove existing culvert and construct new culvert with inlet and outlet concrete aprons, riprap protection, and channel grading.	2-8'x5'x230' RCBC	10'x24' riprap; 17'x39' concrete apron	18'x45' concrete apron; 20'x73' riprap
21	Wash 13 (W13)	2-36"x159' RCP	Remove existing culvert and construct new culvert with inlet and outlet concrete aprons, riprap protection, and channel grading.	4-8'x5'x207' RCBC	28'x70' riprap; 9'x47' concrete apron	17'x47' concrete apron; 68'x77' riprap
22	Constructed Channel 7 (C7)	4-6'x5'x16' RCBC	Remove existing culvert and construct 2 new culverts, one with inlet and outlet concrete aprons and riprap protection.	1-18"x124' RCP; 3-10'x5'x240' RCBC	20'x60' concrete apron	15'x50' concrete apron; 45'x55' riprap
23	Wash 17 (W17)	N/A	Construct new bridge and 510'x50' earthen channel with 30' bottom width and 6:1 side slopes.	148'x167' Bridge (multi-use crossing)	N/A	N/A
24	Wash 18 (W18)	N/A	Construct new culvert with inlet channel grading and concrete apron and outlet concrete apron and riprap protection.	1-48"x282' CMP	8'x14' concrete apron	8'x14' concrete apron; 5'x18' riprap

Table 1 – Construction Activities in WUS

Count	Wash Name and Number	Existing Structure ^A	Primary Construction Activities	Proposed Structure ²	Inlet Protection	Outlet Protection
25	Wash 19 (W19)	N/A	Construct new culvert with inlet channel grading and concrete apron and outlet concrete apron and riprap protection.	2- 48"x192' CMP	9'x21' concrete apron	15'x28' concrete apron; 5'x32' riprap
26	Wash 20 (W20)	N/A	Construct new culvert with inlet channel grading and concrete apron and outlet concrete apron and riprap protection.	1- 48"x198' CHDPEP P	9'x14' concrete apron	15'x20' concrete apron; 5'x20' riprap
27	Wash 21 (W21)	N/A	Construct new culvert with inlet channel grading and concrete apron and outlet concrete apron and riprap protection.	1- 48"x220' CHDPEP P	8'x14' concrete apron	8'x14' concrete apron; 5'x20' riprap
28	Wash 22 (W22)	N/A	Construct new culvert with inlet channel grading and outlet concrete apron and riprap protection.	2- 10'x6'x24' RCBC	N/A	11'x29' concrete apron; 5'x33' riprap
29	Wash 23 (W23)	N/A	Construct new bridge and associated construction access.	145'x147' L Bridge (multi-use crossing)	N/A	N/A
30	Wash 24 (W24)	N/A	Construction access for new bridge at W23.	N/A	N/A	N/A
31	Wash 25 (W25)	N/A	Construct new culvert with inlet and outlet riprap protection.	1- 36"x337' CMP	43'x20' riprap	5'x20' riprap
32	Wash 26 (W26)	N/A	Construct new culvert with inlet riprap protection and outlet concrete apron and riprap dissipator.	1- 10'x4'x35' RCBC	28'x20' riprap	8'x19' concrete apron; 50'x32' grouted riprap

Table 1 – Construction Activities in WUS

Count	Wash Name and Number	Existing Structure ^A	Primary Construction Activities	Proposed Structure ²	Inlet Protection	Outlet Protection
33	Wash 28 (W28)	N/A	Construct new bridge, 329'x74' earthen channel with 43' bottom width and 3:1 side slopes, and 120'x400' spreader basin.	145'x157' Bridge (multi-use crossing)	N/A	27'x62' riprap; 30'x127' riprap
34	Wash 29A (W29A)	N/A	Construct grader ditch to redirect flows via a 160' long earthen channel to W29.	18'x140' GD	N/A	N/A
35	Wash 29 (W29)	N/A	Construct new culvert with inlet grading and concrete apron, and outlet concrete apron, riprap outlet protection, and spreader basin.	1- 10'x4'x21 5' RCBC	7'x18' concrete apron	7'x17' concrete apron; 16'x39' riprap
36	Wash 30 (W30)	N/A	Construct new culvert with inlet grading and outlet riprap protection.	1- 36"x243' CHDPEP P	N/A	12'x16' riprap
37	Wash 31 (W31)	N/A	Construct new culvert with inlet grading and concrete apron, and outlet concrete apron, riprap protection, and spreader basin.	5- 54"x200' CMP	9'x47' concrete apron	9'x47' concrete apron; 18'x76' riprap
38	Wash 32 (W32)	N/A	Construct new culvert with inlet grading and outlet concrete apron, riprap protection, and spreader basin.	2- 10'x4'x22 6' RCBC	N/A	10'x35' concrete apron; 16'x67' riprap

Table 1 – Construction Activities in WUS

Count	Wash Name and Number	Existing Structure ^A	Primary Construction Activities	Proposed Structure ²	Inlet Protection	Outlet Protection
39	Wash 33 (W33)	N/A	Construct new at-grade crossing of local street with upstream riprap protection and new culvert with inlet grading, riprap protection, and concrete apron and outlet concrete apron and riprap protection.	2- 72"x180' CMP	17'x39' riprap; 36'x63' riprap	11'x21' concrete apron; 24'x40' riprap
40	Wash 34 (W34)	N/A	Construct new culvert under local street with riprap inlet protection and a new culvert under SMF with inlet and outlet protection.	4- 30"x48'C MPA; 1- 10'x4'x19 0' RCBC	10'x30' riprap; 51'x40' riprap; 6'x23' concrete apron	16'x15' concrete apron; 16'x38' riprap
41	Wash 35 (W35)	N/A	Construct new at-grade crossing of local street with upstream riprap protection and new culvert with inlet grading and concrete apron and outlet riprap protection.	1- 10'x4'x20 4' RCBC	5'x19' concrete apron	7'x15' concrete apron; 16'x38' riprap
42	Wash 36 (W36)	N/A	Construct new culvert with inlet and outlet grading and riprap protection.	2- 10'x5'x19 2' RCBC	35'x37' riprap	37'x45' riprap protection
43	Wash 37 (W37)	N/A	Construct new culvert with upstream channel grading to redirect flow via a 456' long earthen channel to the new culvert with outlet concrete apron and riprap protection.	5- 72"x284' CMP	N/A	14'x54' concrete apron; 38'x55' riprap protection
44	Wash 38 (W38)	N/A	Construct new at-grade crossing of local street with upstream riprap protection and new culvert with inlet and outlet riprap protection.	1- 36"x250' CHDPEP	19'x32' riprap; 34'x32' riprap	12'x18' riprap

Table 1 – Construction Activities in WUS

Count	Wash Name and Number	Existing Structure ^A	Primary Construction Activities	Proposed Structure ²	Inlet Protection	Outlet Protection
45	Wash 39 (W39)	N/A	Construct new at-grade crossing of local street with upstream riprap protection and new culvert with inlet and outlet riprap protection.	1-36"x261' CHDPEP	19'x28' riprap; 30'x34' riprap	12'x16' riprap
46	Wash 40 (W40)	N/A	Construct new culvert with inlet channel grading and outlet riprap protection.	1-36"x332' CHDPEP	N/A	15'x18' riprap
47	Wash 41 (W41)	N/A	Channel grading to redirect flows via a 225' long earthen channel under new bridge.	145'x134' Bridge (multi-use crossing)	N/A	N/A
48	Laveen Area Conveyance Channel (LACC)	N/A	Remove existing concrete channel lining and construct new culvert with 10' inlet and outlet concrete transitions from new culvert to existing concrete lining; excavation and backfill for Laveen Area Conveyance Channel siphon to be installed upstream from the new RCBC inlet; channel grading and pump around to be installed during construction.	4-12'x16'x320' RCBC	10' concrete transition	10' concrete transition

Table 1 – Construction Activities in WUS

Count	Wash Name and Number	Existing Structure ^A	Primary Construction Activities	Proposed Structure ²	Inlet Protection	Outlet Protection
49	Salt River Mine Pit (SRMP)	N/A	Construct an EB and WB 16-span 85'x 2660' Precast/Prestressed Concrete BT82 Girder Bridge with 4-72" drilled shafts supporting 60" columns for each pier and 10' of riprap scour protection around the base of each pier. Only piers 11, 12, and 13 on both the EB and WB bridges would be placed within WUS.	85'x2,660' Bridges (2)	N/A	N/A
^A <i>Structure Types:</i> CBC = Concrete Box Culvert; CC = Concrete Channel; CHDPEPP = Corrugated High-Density Polyethylene Plastic Pipe; CMP = Corrugated Metal Pipe; CMPA = Corrugated Metal Pipe Arch; GD = Grader Ditch; RCBC = Reinforced Concrete Box Culvert; RCP = Reinforced Concrete Pipe.						

Project Location

The project is located within the City of Phoenix, Tolleson, and unincorporated areas of Maricopa County. ADOT will obtain ROW for the entire project limits and drainage easements from adjacent private landowners. Other adjacent landownership includes the Community, City of Phoenix, Bureau of Land Management, Arizona State Land Department and various private landowners. The Salt River and I-10 Papago Segment of the project is located in a primarily urbanized area, while the Center Segment is a rural/ undeveloped area that is adjacent to the South Mountain Park and Preserve (SMPP). The Pecos Segment of the project is adjacent to several housing developments to the north and agricultural operations on Community lands to the south. The project area falls within the Basin and Range geologic province with elevations ranging from approximately 970 feet to approximately 1,375 feet above mean sea level. Topography in the vicinity of the project is characterized by broad, flat, low-lying desert valleys between relatively low relief isolated mountain (South Mountain and Sierra Estrella). Drainage within the project limits is ephemeral and generally flows south or southwest from South Mountain eventually discharging to the Gila River or fallow agricultural fields on Community lands. The Salt River crosses the project area between Broadway Road and Southern Avenue. Within the project limits, the Salt River is highly disturbed, flows infrequently, and the jurisdictional limits are confined to an inactive mining pit which has captured water and subsequently dried many times, with no consistent water level. The majority of the project

drainages have been altered or disturbed to some extent and several grass and concrete-lined constructed channels including the LACC are waters of the US in the project limits.

Attainment Status of Project Location

Portions of Maricopa County have been designated by the USEPA as being in nonattainment for two pollutants: particulate matter (PM₁₀) and ozone (O₃). In addition, the area has been identified as a maintenance area for Carbon Monoxide (CO). A maintenance area is one that was designated as nonattainment for one of the NAAQS in the past, but later met the standard and was redesignated to attainment.

Scope of Conformity Analysis

Applicability Analysis

A conformity determination is required in a nonattainment and/or maintenance area for each criteria pollutant or precursor where the total direct and indirect emissions of the criteria pollutant or precursor would equal or exceed specified annual emission rates, referred to as "*applicability rates*."

The *applicability rates* for O₃ precursors, PM₁₀, and CO depend on the severity of the nonattainment classification, as shown in Table 2. In an extreme ozone nonattainment area, the *applicability rates* are 10 tons per year (tpy) for both NO_x and VOC (precursor emissions for O₃). In a serious PM₁₀ nonattainment area, the *applicability rate* is 70 tpy. For other pollutants, the threshold is set at 100 tpy.³

Table 2. Applicability rates for nonattainment or maintenance areas in Maricopa County.

Pollutant	Applicability Rate (tpy)
Carbon Monoxide (CO)	100
Particulate Matter (PM ₁₀)	70 (Serious NAA's)
Volatile Organic Compounds (VOC)	100
Nitrogen Oxides (NO _x)	100

Consistent with section 176(c)(1) of the CAA, a federal action is generally defined as any activity engaged in or supported in any way by any department, agency, or instrumentality of the federal government.⁴ Where the federal action is a permit, license, or other approval for some aspect of a non-federal undertaking, the relevant activity is the part, portion, or phase of the non-federal undertaking that requires the federal license, permit, or approval. Consequently, the USEPA's definition of federal action indicates that, in complying with section 176(c), federal

³ 40 C.F.R. § 93.153(b)(1).

⁴ 40 C.F.R. § 93.152.

regulatory agencies are only responsible for analyzing the emissions resulting from the "part, portion, or phase" of the non-federal undertaking that they permit.

With this framework in mind, direct emissions are defined so as to include emissions of a criteria pollutant or its precursors that are caused or initiated by the federal action and occur at the same time and place as the action. Indirect emissions, on the other hand, are those emissions of a criteria pollutant or its precursors:

- "(1) That are caused or initiated by the Federal action and originate in the same nonattainment or maintenance area but occur at a different time or place as the action;
- (2) That are reasonably foreseeable;
- (3) That the agency can practically control; and
- (4) For which the agency has continuing program responsibility. For the purposes of this definition, even if a Federal licensing, rulemaking or other approving action is a required initial step for a subsequent activity that causes emissions, such initial steps do not mean that a Federal agency can practically control any resulting emissions."⁵

As explained in the 1993 preamble:

"The EPA does not believe that it is reasonable to conclude that a Federal agency 'supports' an activity by third persons over whom the agency has no practicable control -- or 'supports' emissions over which the agency has no practicable control -- based on the mere fact that, if one inspects the 'causal' chain of events, the activity or emissions can be described as being a 'reasonably foreseeable' result of the agency's actions."⁶

In fact, the USEPA emphasized in the 1993 preamble that "the person's (*i.e.*, permit applicant's) activities that fall outside of the federal agency's continuing program responsibility to control are subject to control by state and local agencies."⁷ Therefore, the Corps does not have a continuing program responsibility to measure, monitor, control, or mitigate for air emissions that may result from the construction or operation of a non-Corps facility, even though some part, portion, or phase of that facility requires a permit from the Corps. Under the CAA, the state and local clean air agencies have full responsibility and authority to deal with those emissions, and to prevent or condition the construction of the non-federal facility as necessary to deal with those air emissions.

The USEPA also stated its belief "that Congress did not intend the general conformity rule to affect innumerable Federal actions, impose analytical requirements on activities that are very

⁵ 40 C.F.R. § 93.152; see also 75 Fed.Reg. 17273 (April 5, 2010).

⁶ 58 Fed.Reg. 63220 (Nov 30, 1993).

⁷ 58 Fed.Reg. 63222 (November 30, 1993).

minor in terms of Federal involvement and air quality impacts, and result in significant expense and delay."⁸

The preamble to the 1993 general conformity regulations provided an explicit discussion of the Corps' responsibility, which demonstrates the close relationship between the definition of federal action and the restrictive language from the definition of indirect emission, as follows:

"Assume for example, that the Corps issues a permit and that permitted fill activity represents one phase of a larger non-federal undertaking; *i.e.*, the construction of an office building by a non-federal entity. Under the conformity rule, the Corps would be responsible for addressing all emissions from that one phase of the overall office development undertaking that the Corps permit; *i.e.*, the fill activity at the wetland site. However, the Corps is not responsible for evaluating all emissions from later phases of the overall office development (the construction, operation, and use of the office building itself), because later phases generally are not within the Corps continuing program responsibility and generally cannot be practicably controlled by the Corps."⁹

The 2010 revisions to the definition of "indirect emission" are consistent with the preamble to the original 1993 general conformity regulations, which explicitly defined and limited the responsibilities of the Corps with regards to non-federal activities requiring permit authorization from the Corps. In fact, the explanation accompanying the amended definition of "indirect emissions" in the new version of 40 C.F.R. § 93.152 provides:

"EPA is revising the definition of 'indirect emissions' to clarify what is meant by 'the agency can practically control' and 'for which the agency has continuing program responsibility.' This clarification represents USEPA's long standing position that Congress did not intend for conformity to apply to 'cases where, although licensing or approving action is a required initial step for a subsequent activity that causes emissions, the agency has no control over that subsequent activity, either because there is no continuing program responsibility or ability to practically control.'"¹⁰

In essence, the Corps is not legally required to document, analyze, and seek mitigation measures for any indirect emissions of actions requiring Corps permit authorization since the Corps: (i) cannot practicably control such emissions; and (ii) will not have a continuing program responsibility to maintain control over such emissions.

Based on the above, since the Corps only authorize construction of infrastructure improvements pursuant to section 404 of the CWA, only the construction of the infrastructure itself is considered to be a federal action as defined by the general conformity regulations. In other words, because the Corps cannot practicably control emissions from and would not maintain

⁸ 58 Fed.Reg. 63219 (Nov 30, 1993).

⁹ 58 Fed.Reg. 63227 (November 30, 1993).

¹⁰ 75 Fed.Reg. 17254, 17260 (April 5, 2010).

control over activities beyond the infrastructure improvements, the direct and indirect construction and operation emissions associated with the overall SMF project, which will be facilitated by the infrastructure improvements, are not included in this analysis. Further, no operation-related emissions were calculated because once the structures are in place, only incidental emissions associated with inspections, maintenance and repair events would be generated. (See also 40 C.F.R. § 93.153(c)(2).)

In order to calculate emissions for the applicability analysis, a worst-case scenario approach was used (Appendix B). The current construction schedule shows that the construction in WUS would span from late 2017 to 2019. For calculation purposes, all construction activities are assumed to occur in 2018. Since emission factors vary by month, the maximum monthly emission factors were used throughout the analyzed year. Separate calculations were completed for the LACC and the Salt River bridges since they have larger footprints in WUS, would require a greater number of equipment, and would require a longer construction duration. By using the worst-case scenario approach and assuming all emission would occur in one year, the total emissions are weighed against the applicability rates, allowing for a simple comparison.

Estimates of equipment emissions were based on the estimated hours of usage and emission factors for each motorized source for the project. Emission factors for each pollutant related to exhaust emission from equipment that would be used were obtained from the USEPA's Motor Vehicle Emission Simulator (MOVES) 2014a emission factor model, which incorporates the NONROAD2008 model. For fugitive dust emissions, the USEPA AP-42, Compilation of Air Pollution Emission Factors, was used to calculate emissions associated with various activities based on the acres of impacts and the estimate activity days. Table 2 shows the total direct and indirect construction emissions caused by the Corps' Federal action.

Table 3. Pollutant emissions

	CO	PM10 Exhaust	PM10 Fugitive	PM10 Total (F+E)	NOx	VOC
47 small waters of the US	5.60	0.67	1.63	2.30	20.15	2.23
LACC	0.18	0.02	0.34	0.36	0.59	0.07
Salt River	1.43	0.18	15.57	15.75	4.40	0.48
Total	7.21	0.88	17.54	18.42	25.14	2.78
Applicability Rate (tpy)	100	70	70	70	100	100
Equal/Exceeds	No	No	No	No	No	No

The applicability analysis shows that direct and indirect emissions of the Federal action related to Alternative C would not equal or exceed the prescribed emission levels. If the construction schedule noted above is followed, the total emissions would be spread over multiple years, lowering the tons per year that could be released even further. As stated at 40 C.F.R. § 93.153(c)(1), a conformity determination is not required for the action being considered by the Corps.

ENDANGERED SPECIES

The US Fish and Wildlife Service (USFWS) Information, Planning, and Conservation (IPaC) system was accessed by the applicant several times during the project development process to identify any ESA-protected species or habitat potentially occurring within the project area, most recently on September 1, 2017. The IPaC system did not identify any proposed or designated critical habitat within or near the project area, but did identify the following threatened or endangered species as potentially occurring within the project area:

- California least tern (Endangered)
- Lesser long-nosed bat (Endangered)
- Roundtail chub (No longer protected¹¹)
- Sonoran pronghorn (Endangered)
- Southwestern willow flycatcher (Endangered)
- Yellow-billed cuckoo (Threatened)
- Yuma clapper rail (Endangered)

A Biological Assessment (BA) to address the anticipated project impacts was completed in July 2014 by FHWA as the lead federal agency. All ESA-protected species considered in the July 2014 BA are listed below. It was determined by FHWA through the BA that the project will have no effect to any species or habitat protected by the federal ESA.

Threatened, Endangered, and Species proposed for listing with potential to occur in the project area.

Species Name	ESA Status	Habitat Requirements	Exclusion Justification
California least tern <i>(Sterna antillarum browni)</i>	Endangered	Open, bare or sparsely vegetated sand, sandbars, gravel pits, or exposed flats along shorelines of inland rivers, lakes, reservoirs, or drainage	No suitable habitat in the project area; most likely to occur as migrants; lack of adequate water features in project area to support nesting and feeding areas.

¹¹ The roundtail chub was included in the July 2014 BA but excluded from detailed evaluation due to lack of suitable habitat and range considerations. USFWS withdrew the proposed rule to list the DPS of roundtail chub in the Lower Colorado River watershed via Federal Register 82(66):16981-16988 published 4/7/2017 so it no longer receives any protection under the ESA but was still identified in the IPaC report.

Threatened, Endangered, and Species proposed for listing with potential to occur in the project area.

Species Name	ESA Status	Habitat Requirements	Exclusion Justification
		systems below 2,000 feet.	
Lesser long-nosed bat (<i>Leptonycteris curasoae yerbabuenae</i>)	Endangered	From desert scrub to oak transition areas with agave and columnar cacti below 6,000 feet.	No suitable habitat in the project area; only scattered landscaped areas with limited agaves and columnar cacti present.
Roundtail Chub (<i>Gila robusta</i>)	No longer protected	Cool to warm waters of rivers and streams, often will occupy the deepest pools and eddies of large streams, at elevations of 1,000 to 7,500 feet.	No suitable habitat occurs in the project area; populations in the Salt River occur upstream, above dams.
Sonoran pronghorn (<i>Antilocapra americana sonoriensis</i>)	Endangered	Broad intermountain alluvial valleys with creosote-bursage and paloverde mixed cacti associations from 2,000 to 4,000 feet.	Suitable habitat in the project area, but species will not be affected as area is close to urban development; species is not known to occur in the project vicinity ¹² .
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Endangered	Dense riparian vegetation near a permanent or semi-permanent source of water or saturated soil below 8,500 feet.	No suitable riparian habitat within the project area.

¹² For the purposes of this document, project vicinity is used to describe the area in a more expansive, landscape context than project area.

Threatened, Endangered, and Species proposed for listing with potential to occur in the project area.

Species Name	ESA Status	Habitat Requirements	Exclusion Justification
Yellow-billed Cuckoo <i>(Coccyzus americanus)</i>	Threatened	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries) below 6,500 feet.	The proposed project will have no effect on the yellow billed cuckoo or its habitat as: there are no documented occurrences of the species within 2.5 miles of the project area, no suitable habitat occurs for the species in or adjacent to the project area, and only marginally suitable habitat occurs adjacent to the project area.
Yuma clapper rail <i>(Rallus longirostris yumanensis)</i>	Endangered	Fresh water and brackish marshes, associated with dense emergent riparian vegetation below 4,500 feet.	The proposed project will have no effect on the Yuma clapper rail or its habitat as: there are no documented occurrences of the species within 2.5 miles of the project area and no suitable habitat occurs for the species in or adjacent to the project area.

Since completion of the FEIS, USFWS removed the Tucson shovel-nosed snake from the candidate list; therefore, there is no intent to list the snake as threatened or endangered. FHWA and ADOT continue to coordinate with USFWS, AZGFD, and the Community's Department of Environmental Quality during the design phase, and this consultation will determine whether any additional species-specific mitigation measures will be required. In addition to the removal of the Tucson shovel-nosed snake, the yellow-billed cuckoo, which was designated in the FEIS as "proposed threatened," is now listed as threatened with proposed critical habitat. Although proposed critical habitat for the cuckoo occurs within the project vicinity, the proposed critical habitat does not occur within the proposed project area. The proposed project is over 2 miles from the proposed critical habitat.

In a letter dated April 26, 2017, FHWA stated in response to a request from FEMA, during its review of the Conditional Letter of Map Revision (CLOMR), that they maintain the finding of no effect. The letter states, in part, "The USFWS Information, Planning and Conservation (IPaC) system was accessed on February 21, 2017, to identify any new ESA-protected species or habitat

potentially occurring within the project area since the ROD. No additional ESA-protected species or habitats were identified in the IPaC resources list beyond those considered in the ROD. Habitat conditions in the project area have not changed substantially. Therefore, FHWA has determined that a finding of “no effect” to threatened or endangered species or their habitat is appropriate for this project.”

The IPaC system was accessed by ADOT on September 1, 2017 and reviewed by the Corps in order to identify any newly listed species or habitat potentially occurring within the project area since FHWA accessed the IPaC system in February 2017. No additional ESA-protected species or habitats were identified in the IPaC resources list beyond those previously considered by FHWA above.

PUBLIC INTEREST REVIEW AND PUBLIC HEARING

The Corps received 76 comment responses within the initial and extended public notice comment period. The table below lists from whom the comments were received in relation to the public notice. The primary issues of concern expressed in the letters included water quality, drainage and flooding, cultural and historical resources, air quality, noise and impacts to existing residences. Commenters also expressed concern over alternatives, the design-build process, and adequacy of proposed mitigation. The comments were provided by the Corps to the applicant on February 8, 2017, and the applicant’s responses to the comments were received on March 3, 2017.

Table 4.

Public Notice Comments		
Agency/Name	Method of Comment	Number of Comments
EPA Region IX	E-mail	2
FEMA	Letter	2
Community Government	Letter	24
Hopi Tribe	Letters	13
State Historic Preservation Office (SHPO)	E-mail	1
US Coast Guard	Letter	1
Private Citizens (5 Commenters)	E-mails, letter, and phone call	33
Total		76

A request for a public hearing was received from the Community in February 2017 during the comment period following the public notice announcing the Corps consideration of a permit application for the project. During the EIS development, FHWA had held multiple public hearings, forums, and public meetings regarding the project, and transcripts from these functions have been included in the Corps' administrative record. However, because these public outreach efforts did not focus on the potential impacts to aquatic resources, it was decided that a public hearing would be beneficial in order to collect additional information to evaluate the proposed project per 33 C.F.R. Part 327. The Corps accepted the request and notified the Community on March 24, 2017.

The public hearing was held on May 9, 2017 at the Boys and Girls Club of the East Valley-Gila River Branch in Komatke, Arizona. Comments were accepted from the public in three forms: verbally in front of the audience with a time limit, verbally with no time limit to a court reporter located outside of the hearing room, or by submitting written comments. Comments were also accepted in writing ten days after the public hearing. The Corps received 343 comments and a petition in relation to the public hearing. The table below summarizes the comments that were received in relation to the public hearing. The primary issues of concern raised were similar to those raised during the public notice comment period. These included surface water quality, drainage and flooding, tribal, cultural and historical resources, air quality; public interest factors, and discussion of the LEDPA under the Guidelines. Commenters also expressed concern over alternatives, the design-build process, and adequacy of proposed mitigation. The comments were provided to the applicant on May 19, 2017, and responses to the comments were received on June 30, 2017. Appendix C contains the comments received in response to the public notice and the public hearing and the Corps' responses.

Table 5.

Public Hearing Comments		
Agency/Name	Method of Comment	Number of Comments*
The Action Network	E-mail and Petition	66
Community Government	Timed Speaker and Letter	45
Community Tribal Members	Timed Speaker, Untimed Speaker, Written	63
Navajo Nation Tribal Members	Timed Speaker	4
Protecting Arizona's Resources and Children (PARC)	Timed Speaker, Untimed Speaker, and Written	24

Phoenix Mountain Preservation Council (PMPC)	Timed Speaker, Untimed Speaker, Written, and E-mail	51
Sierra Club	Timed Speaker and E-mail	12
Private Citizens	Timed Speaker, Untimed Speaker, Written, and E-mail	76
Total		343
<i>*Note: Some commenters entered the same or similar comment(s) via multiple methods, e.g., during the timed speaker and untimed speaker portions of the public hearing, as well as written comments during the public hearing and/or written comments received after the public hearing.</i>		

Public Interest Factors

Corps regulations at 33 C.F.R. § 320.4(a)(1) identifies factors in addition to the Guidelines that need to be considered. Evaluation of the probable impacts which the proposed activity may have on the public interest requires a careful weighing of all those factors which become relevant in each particular case. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. When a project is in compliance with the Guidelines, the decision whether to authorize a proposal, and if so, the conditions under which it will be allowed to occur, are determined by the outcome of this general balancing process. Aided by the analyses contained in the NEPA documents and Final CWA 404(b)(1) Guidelines Analysis, as well as comments received from the public, agencies, and Native American tribes, a broad array of public interest factors were considered in light of the Alternative C, which is the action proposed by the applicant. Below is a summary of the public interest factors considered, followed by a discussion of the effects for that factor.

				+ Beneficial effect
				0 Negligible effect
				- Adverse effect
				M Neutral as result of mitigation actions
+	0	-	M	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Conservation.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Economics.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Aesthetics.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	General environmental concerns.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wetlands.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Historic properties.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Fish and wildlife values
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Flood hazards.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Floodplain values.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Land use.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Navigation.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Shore erosion and accretion.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Recreation.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Water supply and conservation.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Water quality.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Energy needs.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Safety.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Food and fiber production.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mineral needs.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Considerations of property ownership.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Needs and welfare of the people.

1. Conservation (Negligible effect):

The existing use or conservation of natural resources is not expected to be substantially effected with implementation of the mitigation measures described in the FEIS.

2. Economics (Beneficial effect):

The project occurs entirely within the City of Phoenix and unincorporated portions of Maricopa County through lands that are subject to property tax. The project would result in conversion of a taxable land base to a nontaxable land base. This reduction in tax revenue experienced by the City of Phoenix would be inconsequential (FHWA and ADOT 2015).

The time spent delayed in traffic congestion represents losses of millions of dollars annually. Real monetary costs include diminished productivity, worker availability, freight inventory, logistics, just-in-time production, and market access (Weisbrod et al. 2001). The project would substantially benefit the region through reduced travel times and improved movement of goods and delivery of services. According to the FHWA ROD, the estimated annual savings is 13 million hours of travel time in 2035 and a total

estimated reduction in travel time from 2020 to 2035 that would save \$3.37 billion (in 2013 dollars).

A frequently submitted public comment during the project study phase was the concern that the new freeway would negatively impact residential property values. As discussed in the EIS, few detailed analyses on the subject exist. However, based on the information available (which includes a case study on the Superstition Freeway in Phoenix), freeway construction may have an adverse impact on some properties, but in the aggregate, property values tend to increase.

3. Aesthetics (Adverse effect):

The project would introduce a substantial human-made feature (a new freeway) into the environment, which is likely to impact views for most residents in the area and for visitors to the far western portion of SMPP. The freeway would cut through a series of three South Mountain ridgelines, resulting in a noticeable scar on the landscape in addition to the freeway itself. In the easternmost portion of the eastern section, the freeway would replace the existing four-lane, east–west arterial Pecos Road at the southern edge of a primarily built-out residential community.

The project includes commitments to minimize impacts in the South Mountains area. Sensitive views along Pecos Road in the eastern section would be affected; however, the road cuts proposed for the western end of the South Mountains would be designed to ensure that the newly exposed rock faces would match the adjacent natural rock features, including scale, shape, slope, and fracturing as much as possible. Native desert vegetation and neutral-colored hardscaping, similar to that found on other Phoenix area freeways, would be used. ADOT is working with municipalities' staff to incorporate aesthetically pleasing features into the project to offset impacts. Regardless, some views would remain adversely altered.

4. General environmental concerns (Neutral as a result of mitigation actions):

While the project may increase the rate of development occurring in the project area, it would not provide new or substantially improved access to a large, undeveloped geographic area or areas that have not already been committed to urban land uses. Much of the buildable area surrounding the project which is not on Community lands has already been developed or is preserved by the SMPP.

The proposed project would not contribute to any new local air quality violations, increase the frequency or severity of any existing violation, or delay timely attainment of the NAAQS or any required interim emissions reductions or other milestones. As determined above, construction emissions of CO, PM₁₀ exhaust, NO_x, and VOC within WUS were modeled and the results indicate there would be no exceedance of the General Conformity applicability rates during construction.

Measures would be implemented in all areas of the project (not just WUS) to reduce impacts to air quality during construction. These measures are identified in Table 3 of the FHWA ROD, and include practices such as using water trucks and dust suppressants on unpaved roads, using equipment that meets USEPA's Tier 4 emission standards or alternative fuels, minimize unnecessary vehicular and machinery activities, and minimize land disturbances. Implementing these measures would reduce construction-related emissions. These measures would be enforced through local ordinances or by FHWA.

5. Wetlands (Negligible effect):

There are no wetlands in the project area.

6. Historic properties (Adverse effect):

Section 106 of the NHPA requires that federal agencies consider the effects of their undertakings on historic properties and implement a government-to-government relationship between the federal government and Native American Tribes. Consultation with tribal authorities, the SHPO, and other stakeholders is required. FHWA, as the lead Federal agency, consulted with Community government officials, the Community's tribal historic preservation Office (THPO), other Native American tribal authorities, and the SHPO. This consultation resulted in concurrence from the SHPO, Arizona State Museum, and the City of Phoenix Historic Preservation Office on properties eligible for listing on the National Register of Historic Places (NRHP), including traditional cultural properties (TCP), project effects, and proposed mitigation and measures to minimize harm to eligible properties. FHWA's consultation is ongoing and will continue until all commitments agreed to by the project sponsors are completed.

Planning efforts to reduce project impacts on cultural resources have been extensive. Coordination with Section 106 consulted parties has resulted in adjustments to the project to avoid and reduce impacts on known cultural resources in the project area. However, avoidance of all impacts will not be possible. The project would affect prehistoric and historic cultural resources:

- The project traverses the location of 16 archaeological sites; archaeological excavations and other forms of data collection will occur to determine the full extent of these sites and any others that may be discovered and mitigate the adverse effects of the undertaking. In most cases, sites will be treated to a phase I testing phase to determine what additional actions are needed to extract the information potential from the site. Depending on the results of the phase I testing, sites may require additional excavations, or data recovery, to remove buried archaeological remains.
- The Selected Alternative will adversely affect the South Mountains TCP and archaeological sites that contribute to its NRHP eligibility; a multifaceted program of tribal outreach and consultation, ethnographic studies, archival research, and archaeological documentation will be implemented to mitigate the adverse effects of the undertaking on the South Mountains TCP.

Because effects on NRHP-eligible sites are not fully known until on-going data recovery is complete, a programmatic agreement (PA) has been developed and executed. The Corps is a concurring party to this agreement, which designates FHWA to act as lead federal agency for the purposes of Section 106 compliance. The PA describes the process for proper treatment and management of affected resources, outlines the specific actions and their responsible parties, and includes the ongoing consultation requirements. The PA was executed in 2006 and revised in 2015 to extend the duration and address changes that occurred when the project transitioned to the P3 project delivery method. In response to ADOT's permit application, the Corps signed the PA as a concurring party on September 26, 2017.

Cultural and religious places of importance, such as the South Mountains, were referenced in the FEIS. To account for these resources, FHWA and ADOT conducted cultural resource studies and continue engaging the Community THPO and other Tribes regarding the identification and evaluation of places of religious and cultural importance to Native Americans. This consultation will continue until all commitments from the FHWA ROD and PA are completed.

While impacts on the South Mountains TCP will be substantial and unique in context, they will not prohibit ongoing access and the cultural and religious practices by Native American Tribes. Mitigation measures and measures to minimize harm have been developed through a process of extensive consultation, analysis of avoidance alternatives, and development of mitigation strategies to accommodate and preserve (to the fullest extent possible from the available alternatives) access to the South Mountains for religious purposes. Five multi-use crossings (bridges) will be constructed in the center segment to allow both people and wildlife to cross under the freeway. These multi-use crossing will ensure that Community members are able to access the South Mountains from Community lands. In addition, the PA developed for the project includes commitments for ADOT and FHWA to fund a TCP evaluation of the South Mountains TCP, as well as a TCP enhancement and management plan, both of which would be prepared by the Community.

7. Fish and wildlife values (Neutral as a result of mitigation actions):

The project design and construction contract documents include binding requirements to protect wildlife and wildlife habitat during construction, such as native plant inventory and salvage; measures to minimize the spread of invasive species and general impacts to habitat; conducting pre-construction surveys for special status species such as burrowing owl and Sonoran desert tortoise; requiring a biological monitor for ground disturbing activities between 24th Street and 51st Avenue; and avoidance of active migratory bird nests.

The project would diminish habitat, foraging, and nesting resources for general wildlife; and would continue the trend of increasing habitat fragmentation as urbanization

continues around SMPP. However, the project includes commitments to protect wildlife during construction and minimize impacts to wildlife movement once the freeway is built. Based on coordination with ADOT, the Arizona Department of Game and Fish, and the Community, potential wildlife crossings were evaluated during project development. Five multi-use crossings (four of which are located at WUS) would be constructed to maintain connectivity for wildlife movement from the South Mountains to lowlands and the Sierra Estrella Mountains to the southwest. Two additional small animal crossing structures, also at WUS, would be constructed along Pecos Road. Fencing designed to funnel wildlife to these crossings while reducing the potential for wildlife-vehicle collisions would also be constructed.

8. Flood hazards (Neutral as a result of mitigation actions):

The project would affect two 100-year floodplains in the project area. However, impacts from floodplain encroachment would be effectively mitigated through elevated bridged crossings of the Salt River and RID Canal using appropriate bridge design. A CLOMR has been submitted to the FEMA and area floodplain managers have been provided the opportunity to review and comment on design plans.

Hydrological and hydraulic analyses conducted to date as part of the design process indicate that downstream impacts would likely not occur as a result of the project (See Hydrology and Hydraulics Review Section below).

Throughout the project, on-site drainage would be captured with catch basins and storm drains and conveyed to first-flush basins to keep on-site drainage separate from off-site drainage until the on-site drainage is treated via the first-flush basins. This also prevents changes to discharge, velocity, or surface elevation of WUS flowing through the project area, which helps avoid or minimizes impacts to drainage patterns, circulation, and fluctuation. Offsite flows WUS would be passed under the freeway and flow characteristics in these drainages would be maintained. ADOT has placed the following requirements on C202P to achieve this:

- The Developer shall not permit any increase in water surface elevation from existing conditions upstream or downstream of the project ROW
- Modifications must be made to new or existing drainage features to achieve no rise in water surface elevation outside of the ROW
- Discharge, velocity, or water surface elevation at the outfalls to existing drainage conveyance features must not increase from the existing conditions

Regular sediment and debris removal from these structures would also ensure that flows continue to pass through the structures as designed, reducing the potential for flood risks to develop over time. In order to minimize impacts, special conditions would be placed on the permit requiring ADOT to prevent any increase in flow characteristics such as discharge, velocity, and surface water elevation that would result in flooding, erosion, or scour on adjacent properties. If increases are unavoidable, mitigation measures would

need to be implemented to reduce any increases to a level that will not cause adverse impacts beyond existing conditions.

As discussed in the 404(b)(1) Guidelines analysis, the Community has expressed concerns regarding the project's potential to result in increased flooding frequency on their lands, which are located downstream of the project and just below the foothills of the South Mountains. Two areas of particular concern are the Vee Quiva Casino and the Pecos Road area, which have seen flooding issues in the past.

The Corps has worked to facilitate discussions between ADOT and the Community's Land Use Planning and Zoning Department's Flood Control Section in order address these concerns. As a result of these discussions, ADOT has shared drainage reports and hydrologic data with the Community as they have been developed. In response, the Community has provided comments, to which ADOT has provided responses. As a result, some designs have been modified to address these concerns, particularly near the casino and upstream of Komatke.

The Engineering Division of the Corps' Los Angeles District independently reviewed the drainage designs and modeling data for the Pecos Segment, as described in the Hydrology and Hydraulics Section below. The review confirmed that, except for Wash C4, the project's drainage design is not likely to cause impacts downstream of the project because existing flow patterns and drainage configurations were being maintained and the velocities were being reduced to a level that would not increase erosion or cause a downstream adverse impact. As a result of the Corps' review, the applicant elected to modify the design for Wash C4 to better maintain flow patterns. As a result, if a permit is issued, a special condition would be included to ensure no discharges of fill material would be allowed to occur in this wash where modifications are proposed (20 feet downstream of the freeway mainline toe of slope) until updated drainage designs are submitted to the Corps for review and the applicant receives a written notice to proceed from the Corps. No additional analysis for compliance with the 404(b)(1) Guidelines would be needed since the modification would not result in additional permanent impacts to WUS and impacts to the aquatic environment have already been considered.

Drainage design and modeling data for the Center Segment have not been submitted by ADOT for the Corps' review. In late October 2017, the Community authorized implementation of the Komatke Area Drainage Master Plan to resolve short-term and long-term flooding in the Komatke Area. This plan was based on the Komatke Area Drainage Master Study, developed to identify existing flood hazards and recommend regional flood mitigation alternatives in the Komatke Area. Because of these two factors it is unclear if the proposed drainage crossings in the Center Segment would have impacts downstream on Community lands. The Corps will undertake a similar review of the Center Segment drainage structures once the information is available and prior to allowing any work within WUS to occur in this segment. As with the Pecos Segment, the Corps' review of the Center Segment's drainage designs and modeling data will provide

independent verification that authorized discharges in that segment will not cause adverse effects from water elevations or velocities downstream. Corps-authorized work in the Center Segment will not occur unless and until the Corps can make that verification. If a permit is issued, a special condition would be included to ensure no discharges of fill material in WUS within the Center Segment are allowed to occur unless and until ADOT 1) considers the information provided in the Komatke Area Drainage Master Study 2) conducts a drainage analysis acceptable to the Corps, 3) submits the drainage reports and hydrologic data to the Corps, and 4) receives written notice to proceed from the Corps.

9. Floodplain values (Negligible effect):

The project would affect the 100-year floodplains associated with the Salt River and the RID Canal. However, impacts from floodplain encroachment would be effectively mitigated through elevated bridged crossings of the Salt River and RID Canal using appropriate bridge design. The City of Phoenix floodplain manager and the Flood Control District of Maricopa County have both reviewed and signed the CLOMR, which has been submitted to FEMA.

The Salt River has been substantially altered from its natural condition. Control of flow by upstream dams and reservoirs has resulted in the channel being dry for years at a time. Major flow occurs only when water is released from the upstream facilities. The dry channel has been subject to sand and gravel operations, which have further altered the channel configuration. These alterations can increase some beneficial values and decrease others, such as wildlife habitat. Because of these altered conditions, the project would not further diminish natural floodplain values. Because of urbanization adjacent to the Salt River and the continuing sand and gravel mining operations, wildlife habitats in the affected areas are of low value. The ability for wildlife to move freely within the remaining habitat would continue because bridges would not impede movement. Therefore, the project would not diminish values of remaining habitat. Bridge piers would have a negligible impact on the floodplain's capacity for groundwater recharge or flood attenuation. Overall, impacts on floodplain values would be negligible.

Floodplain values are also associated with other WUS impacted by the project. However, in areas such as Pecos Road, these values have already been impacted by the existing roadway and development and the freeway is not expected to substantially impact functions such as energy dissipation, surface water storage, groundwater recharge, sediment transport, or habitat connectivity/structure. In other areas where no existing development has occurred, decreases would occur to energy dissipation and habitat connectivity through the placement of concrete box culverts and corrugated metal pipes within WUS. However, through appropriate design and incorporation of measures to reduce energy and accommodate wildlife, these impacts would be minimized. The H&H review conducted by the Corps verified that these increases in velocity were minimized on the Pecos Segment, and the Corps will do the same for the Center Segment during a subsequent review. Regarding wildlife, five multi-use crossings and two small-animal crossings have been incorporated in the design after consultation with AZGFD occurred.

These crossings allow for wildlife to continue to move freeway through natural travel corridors, and should minimize impacts to wildlife.

10. Land use (Negligible effect):

The proposed freeway has been planned through local and regional long-range planning efforts since the mid-1980s. Vacant and agricultural land is rapidly being converted to other uses in the Phoenix metropolitan area, and this trend would be expected to continue with or without the proposed project. In 2000, much of the western section of the project area was agrarian and rural in character. By 2035, project area land uses are expected to have converted to an urbanized setting, with single-family residential communities, commercial cores, and industrial corridors, regardless of whether the project would be constructed. Only 12 percent of the FHWA EIS study area is planned for future agricultural use by local municipal zoning ordinances. The total conversion of existing land use to a transportation use would be negligible when placed in the context of the amount of land in the region available for all types of land development. Therefore, impacts on the availability of existing and planned land uses would be minimal.

11. Navigation (Negligible effect):

There are no navigable waters in the project area and the project would not affect navigation.

12. Shore erosion and accretion (Neutral as a result of mitigation actions):

Shore erosion and accretion in ephemeral systems occurs as a result of erosion, head cuts, or sedimentation. As discussed in the 404(b)(1) analysis, the applicant has committed to maintaining the existing flow characteristics within WUS, which would reduce the risk of increased scour, erosion or sedimentation from occurring. In addition, proposed measures such as placing riprap or concrete aprons to armor areas prone to erosion as well as constructing energy dissipation structures to reduce velocities (as appropriate) would reduce the risk of scour or erosion from occurring. Proposed maintenance of the structures such as sediment removal and erosion repair would ensure that flow carrying capacities would be maintained and reduce the hazard to public that results from the condition of watercourses congested with sediment. By implementing these measures, the effects to shore erosion and accretion are expected to be neutral.

13. Recreation (Neutral as a result of mitigation actions):

No water-related recreation occurs within the project area. However, the project is located directly adjacent to the SMPP and would be constructed on 31.3 acres of former park land (ADOT currently has possession of the former SMPP land within the project ROW by order of immediate possession, but would ultimately own the land in fee). WUS are features that contribute to the recreational value of the SMPP.

Sections of the freeway would be visible from vantage points within the park, such as along the Bursera Trail. The freeway would also generate noise that would be audible from locations in the park, such as trails. However, based on the distance of the freeway

to the closest trail points, noise levels are not likely to be above levels requiring noise abatement for recreational activities. Trail users located 2,000 feet or more away from the freeway would hear an increased hum, but the decibel levels would not warrant abatement measures. The use of mitigation, such as noise barriers, would have little effect for receptors 2,000 feet or more away from the freeway (and at elevated positions). Even if it were shown that noise levels are higher on the trail, noise barriers would not be cost effective for trails given the relatively low usage and receptor benefits. Noise impacts would be experienced temporarily by trail users moving along the trail because only a short portion of the trail is in a direct line to the freeway.

City of Phoenix urban planning documents in mid-1980s acknowledged the planning of the freeway in proximity to SMPP. In 1989, the South Mountain Park Master Plan was adopted by the Phoenix City Council showing the freeway alignment as adopted by the State Transportation Board in 1988. In 1990, the Phoenix Mountain Preserve Act was ratified by the Arizona Legislature. Because the Act did not apply to roadways through a designated mountain preserve if they were adopted into the State Highway System Plan prior to August 15, 1990, the construction of SMF is not prohibited by the Act. The grandfather exception for roadways planned prior to August 15, 1990, is understood to have been incorporated into the Act to allow the freeway alignment to go through SMPP. Alternatives to avoid the park have been studied, but did not identify any feasible and prudent alternatives to avoid impacting the park. The proposed freeway was designed to mostly avoid the 16,000-acre park without going on Community land. The project sponsors continue to engage park stakeholders to minimize impacts and address concerns.

To reduce impacts to the SMPP, the project's footprint within the park was reduced from the original 40 acres proposed in 1988 to 31.3 acres under the current design. Furthermore, the project would skirt the park as much as possible and avoid areas where most recreation activity is focused. As required for Land and Water Conservation Fund-assisted sites, replacement land would be replaced for the converted park land. The applicant would also apply design features such as slope treatments, rock sculpting, native vegetation landscaping and buffering, and native vegetation transplanting to blend the appearance of the freeway and slope cuts with the surrounding natural environment, as feasible.

14. Water supply and conservation (Negligible effect):

There are no reservoirs or surface water features within or immediately downstream of the project area that supply water for human use. However, approximately 121 wells would potentially be affected by the project. If a well is adversely affected by freeway operation, well abandonment and compensation (e.g., drilling a new well) may be required. If the well were acquired, the water would be replaced. The project would also impact irrigation ditches and pipelines, but impacts would be mitigated by re-routing ditches, converting open ditches to pipes that would cross under the freeway, or otherwise replacing the water supplied by these irrigation features.

15. Water quality (Neutral as a result of mitigation actions):

The project is subject to an individual Section 401 water quality certification and an Arizona Pollutant Discharge Elimination System (AZPDES) permit, both of which include requirements to protect water quality during construction. On February 21, 2017, ADEQ issued an individual Section 401 water quality certification for the project, which includes conditions that must be followed to minimize water quality impacts. On October 13, 2017, ADOT provided ADEQ updated information for the WQC regarding changes in design that had occurred since the issuance of the WQC (ADOT also provided this information to the Corps in a revised DA permit application package on October 4th, 2017). In its response, ADEQ did not provide any comments or concerns and stated that it would note the impact changes to their files. On October 31, 2017 ADEQ followed up their response by stating that the modifications did not require recertification and that the February 2017 WQC adequately certifies that the project will not violate applicable surface water quality standards. A storm water pollution prevention plan (SWPPP) has also been developed and is being implemented to protect water quality during construction. The SWPPP specifies best management practices (BMPs) to control erosion and sediment due to construction-related activities, in addition to waste discharges of construction-related contaminants and appropriate hazardous materials handling, storage, and spill response practices. The SWPPP is updated regularly as construction progresses and the functionality of BMPs are monitored and assessed daily. Within the Salt River and the LACC, dewatering operations and rerouting of flows may occur while work is underway. However, special conditions would require that no increase in sediment occurs downstream of the project site when dewatering operations occur, and all fill must be free of contaminants.

As stated in the EIS, the new freeway would concentrate vehicular traffic and the associated accumulation of pollutants throughout the road corridor. However, ADOT is required per the stipulations of their Municipal Separate Storm Sewer System (MS4) permit issued by ADEQ to “protect water quality by reducing, to the maximum extent practicable, any discharge that may cause or contribute to an exceedance of any SWQS of the State of Arizona (A.A.C. Title 18, Chapter 11, Article 1), applicable to receiving waters of the MS4.” As discussed in the 404(b)(1) analysis and the EIS, first flush basins would be constructed along the project to treat the runoff from the road surface. These basins would capture the first ½” of runoff and hold them for a sufficient time to allow the pollutant to settle out before being released to WUS. Because of these mitigation actions, the project is expected to have a negligible impact on water quality.

16. Energy needs (Beneficial effect):

Increased traffic congestion is major contributor to increases in fuel consumption. According to the analysis on energy use in the EIS, the project would increase energy consumption in the area during construction, but is expected to result in less consumption of fuel than if the freeway not built. Results of the analysis indicated that in 2035, the annual regional automobile energy use with the SMF is projected to be approximately 2.848 billion gallons per year, which is 26 million gallons less than the projected use if

the freeway was not built due to the higher vehicle hours traveled at lower, more fuel inefficient speeds that would occur without the freeway.

17. Safety (Beneficial effect):

The project would provide improved accessibility within the local community and to other portions of the greater Phoenix metro area. Currently, semi-trucks and other vehicles traveling between the industrial areas on the west side of Phoenix and destinations east of Phoenix frequently use arterial streets such as 51st Avenue and Riggs Road as a bypass during times of high traffic volume. Fifty-First Avenue travels through primarily residential areas in Laveen and on Community lands, which can be hazardous during times of high volume due to the traffic entering and exiting 51st Avenue from side streets and driveways. As the population in Laveen continues to grow, congestion in the area is likely to increase. Constructing the freeway would provide a safer and more efficient route when compared to 51st Avenue since the freeway would be a high capacity, limited access facility. The freeway would also reduce traffic congestion on arterial streets within the area, improving the operation and safety in the area by reducing the number of accidents that may occur.

18. Food and fiber production (Negligible effect):

The project would convert approximately 708 acres of agricultural land to transportation use and may fragment some agricultural parcels such that the remaining portions of the parcels are no longer suitable for agriculture. However, this conversion would likely occur regardless of whether the freeway is built. Much of the agricultural land in the project area has been converted to urban uses in the last 15 years, and the conversion is likely to continue into the future.

19. Mineral needs (Negligible effect):

The project would adversely affect three sand and gravel companies through ROW acquisition, though only one of the companies is actively mining in the project area. However, sand and gravel mining is a common along the Salt River in the project vicinity and the project is not anticipated to result in a lack of availability of sand and gravel in the Phoenix metro area. Other mineral needs are not expected to be impacted since the mining of precious metals in the area has been historically infrequent in the project vicinity and is not likely to occur in the future.

20. Considerations of property ownership (Neutral as a result of mitigation actions):

Displacements resulting from the project would mostly be residential housing. Local jurisdictions have accommodated the project in their planning and consequently fewer homes and housing units would be impacted had they not made such accommodations. The project would result in displacement of approximately 169 single-family homes, two apartment complexes encompassing 680 multi-family housing units, and 42 businesses. These displacements would be consistent with a project the magnitude of the proposed action located in a growing region. As project sponsors, ADOT and FHWA have used and consistently applied the required acquisition and relocation assistance program

afforded to affected residents and businesses. The program would effectively mitigate relocation impacts.

Land acquisition and relocation assistance services for the project would be available to all individuals in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act. The implementing regulation for federally funded highway projects is 49 C.F.R. Part 24. The Uniform Act's objectives are to:

- Provide uniform, fair, and equitable treatment of people whose property is acquired or who are displaced as a result of a federally funded project
- Ensure relocation assistance is provided to displaced people to lessen the emotional and financial impact of being displaced
- Ensure that no individual or family is displaced unless decent, safe, and sanitary housing is available within the displaced person's financial means
- Improve the housing conditions of displaced people living in substandard housing
- Encourage and expedite acquisition by agreement and without coercion

21. Needs and welfare of the people (Beneficial effect):

Transportation is a basic need that must be addressed to ensure that residents can safely travel to work or school and businesses can reach their customers. Without improvements to the regional transportation system, the ability of the region to meet this need would decrease, impacting the quality of life and the economic viability of the area. The project would help in fulfilling the regions' transportation needs by alleviating the region's congestion, travel delays, and limited travel options for moving people and goods safely through the southwestern quadrant of the phoenix metropolitan area. The project would benefit the needs and welfare of the people.

HYDROLOGY AND HYDRAULICS REVIEW

The Engineering Division of the Corps' Los Angeles District conducted a hydrology and hydraulics (H&H) review of the drainage design and modeling data developed by C202P and ADOT for the Pecos Segment of the SMF. This review was undertaken in response to the Community's concerns that the project could potentially worsen existing flooding conditions on their lands. The objective of the review was to independently verify the analysis conducted by ADOT and C202P, which concluded that downstream impacts in the Pecos Segment would not be expected to occur as a result of the project.

The proposed freeway is located to the north of and directly adjacent to the Community along the Pecos and Center Segments, which is south and west of the South Mountains (See Figure 3 and 4). Potential WUS that may be impacted by the project flow are ephemeral washes that flow from the mountains directly onto the Community after passing through the ROW. In the eastern portion (Pecos Segment) of the project, agricultural operations are located downstream of a residential area and Pecos Road, which was constructed by the City of Phoenix and would be

replaced by the freeway. Flooding has been an issue in this area as Pecos Road is frequently overtopped during significant storm events, impacting the agriculture operations on the Community. Both ADOT and the Community have stated that the drainage structures along Pecos Road are undersized, which result in overtopping of the road.

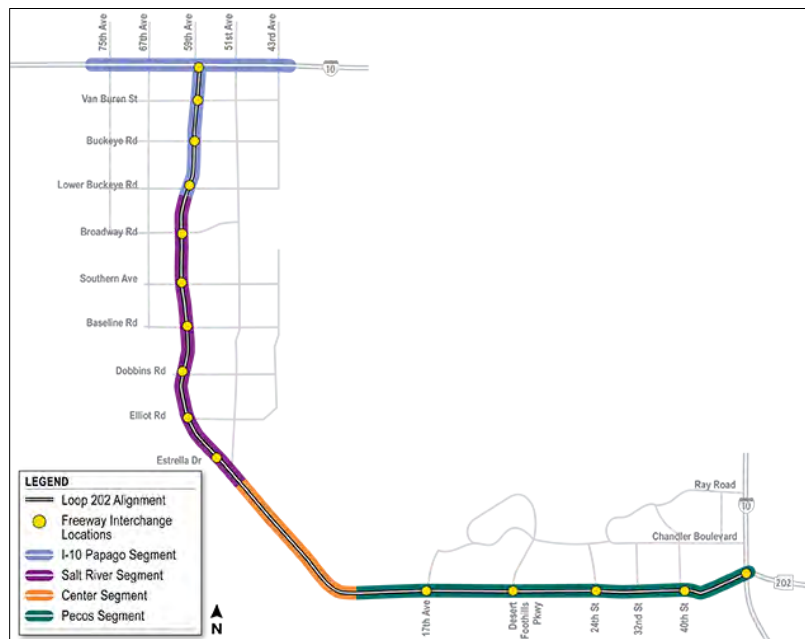


Figure 3 and 4. Project Segments in Relation to the Community and the South Mountains

In the Center Segment, the community of Komatke and a casino operated by the Community are located downstream of the project and have experienced flooding conditions in the past. The area is located on a large alluvial fan that is formed between the two main ridges of the mountain range. Currently, much of the project area in this segment is open desert with the exception of two small residential areas. In order to address the existing flooding concerns, the Community developed the Komatke Area Drainage Master Study in 2016 to identify existing flood hazards and recommend regional flood mitigation alternatives in the Komatke Area (Community, 2016). In late October 2017, the Community Council authorized implementation of the Komatke Area Drainage Master Plan, which quantifies and identifies conceptual solutions to mitigate existing flood conditions (Community, 2017). During government-to-government consultation with the Corps, the Community expressed their concerns that the SMF would result in different conditions than what is accounted for in the plan.

ADOT and C202P have asserted that all drainage structures for the proposed project have been designed to prevent downstream impacts and that the project would not result in any increase in potential for flooding, erosion, or scour, as compared to without-project conditions. In order to implement the environmental commitments and mitigation measures made in the FHWA ROD, culvert structures would be designed to convey flows of the 50-year storm event, at a minimum. With the 100-year storm, water levels would not significantly increase flood damage potential on areas outside of the proposed ROW or as noted in accordance with ADOT's Roadway Design Guidelines (2012a), Section 611.3.C. These structures would be larger than the ones currently in place on Pecos Road, reducing overtopping. However, drainage patterns would be maintained by allowing for overtopping over the proposed shared-use path to maintain sheet-flow characteristics. Onsite flows from the freeway would be directed to first-flush basins to reduce impacts to water quality. Water from these basins would be slowly released into WUS over time to allow pollutants to settle out and to minimize increases in flows occurring within WUS. In addition, the existing configuration of WUS would be maintained downstream of the project, meaning that flows will not be cutoff or redirected to other drainages. ADOT has placed the following technical provisions in the agreement between the department and C202P to ensure that no downstream impacts would occur:

- The Developer [C202P] shall not permit any increase in water surface elevation from existing conditions upstream or downstream of the project ROW
- Modifications must be made to new or existing drainage features to achieve no rise in water surface elevation outside of the ROW
- Discharge, velocity, or water surface elevation at the outfalls to existing drainage conveyance features must not increase from the existing conditions

During the consideration of the Section 404 permit application, drainage information had only been finalized for the Pecos Segment. The Center Segment was still under development since design modification had recently occurred as a result of consultation with the Community and

efforts made by ADOT to address their concerns. H&H information has not been made available yet so as a result, the Corps only conducted the H&H review on the Pecos Segment.

The Corps reviewed the methodology Connect 202 and ADOT used to analyze the existing and proposed 100-yr H&H. The review included spot checking flow rate calculations, water surface elevations, flow velocities, and flow patterns in the vicinity of existing and proposed culverts in the Pecos Segment. Input data for various HEC-RAS models was also checked. Since the information was developed using ADOT's specifications and accepted by the department, the general procedures and analyses results were evaluated, and an in-depth check of all of the C202P's H&H calculations was not conducted.

The evaluation considered changes in the flow patterns and increases in flow velocity to determine if there would be downstream impacts to the Community due to the SMF. C202P, as the developer for the project, provided information along with ADOT for the project. The Corps reviewed the following documents as part of the review:

- a. Arizona Department of Transportation and Connect 202 Partners, An Excerpt from Master Drainage Report, South Mountain Freeway Pecos Segment Hydrology, July 2017.
- b. Arizona Department of Transportation, Letter of Transmittal to Gila River Indian Community, Project No H882701C, 17 August 2017.
- c. Arizona Department of Transportation and Connect 202 Partners, Final Drainage Report Section II, South Mountain Freeway Pecos Segment Hydrology, February 2017.
- d. Arizona Department of Transportation and Connect 202 Partners, SR202L SMF - GRIC Segment A Drainage Comments and Responses.
- e. Arizona Department of Transportation and Connect 202 Partners, SR202L SMF – USACE Review Comments, November 7, 2017)
- f. Flood Control District of Maricopa County, Drainage Design Manual for Maricopa County, Erosion Control, August 2009.
- g. Corps Engineering Manual (EM) 1110-2-1601, Hydraulic Design for Flood Control Channels

The soil types in the area vary between Soil Type A (Deep Sand) and Soil Type C (Clay Loam). Assuming a Silty Loam as an average between the two different soil types, a non-erosive velocity for Silty Loam was assumed acceptable for the project. Per the Maricopa County Drainage design Manual Table 5.1, the non-erosive velocity for Silt Loam is 3.0 feet per second (fps). In addition, EM 1110-2-1601, Table 2-5 indicates a non-erosive velocity of 4.0 fps for

Course Sand and 2.0 fps for Fine Sand. Therefore, even for the areas that are exclusively Soil Type A, an average nonerosive velocity for deep sand is also 3.3 fps. Flows entering GRIC land may cause erosion because they are above 3 fps in the existing condition, however an increase in velocity of less than 0.5 fps should not noticeably increase erosion or cause a downstream adverse impact.

The constraints put on the review were to not increase velocities more than 0.5 feet per second (fps) unless velocities were less than 3.0 fps and to not modify the existing drainage patterns so that the downstream lands are not adversely impacted by the project (i.e. If Pecos Road overtops in the existing condition causing flow to sheet flow onto GRIC land and the project is proposing to concentrate that flow into a culvert, the flow would need to spread that flow back out so that it sheet flows onto GRIC land in the proposed condition.).

As a result of the review, the Corps provided C202P and ADOT 12 comments on the Pecos Segment (Corps, 2017). As of November 8, 2017, the majority of comments had been resolved and the Corps felt that it could reasonably conclude that flow velocities would be reasonably reduced and flows would match the existing flow patterns for the Pecos Segment. C202P would still need to respond to the remaining comments to complete the documentation.

As a result of the Pecos Segment review, C202P elected to modify the design at Wash C4 and another crossing outside of WUS to ensure that existing flow patterns are maintained. Because of the modification in design, if a permit is issued, a special condition would be included to ensure no discharges of fill material would be allowed to occur in Wash C4 until updated design drawings are submitted to the Corps for review, and the applicant receives a written notice to proceed from the Corps. However, for the purposes of the 404(b)(1) Guidelines, no additional analysis would be needed since permanent impacts would not increase and the impacts to the aquatic environment have already been considered.

In regards to the Center Segment, ADOT and C202P have consulted with the Community since June 2017 regarding the design of this segment. As a result, design modifications were made to address the comments received to reduce impacts and maintain existing flow characteristics. Since the drainage analysis was not available for the Center Segment at the time of the review, the Corps will undertake a similar review once the information is available and prior to allowing any work within WUS to occur in this segment. As with the Pecos Segment, the Corps' review of the Center Segment's drainage designs and modeling data will provide independent verification that authorized discharges in that segment will not cause adverse effects from changes in flow patterns or velocities downstream. Corps-authorized work in the Center Segment will not occur unless and until the Corps can make that verification. If the permit is issued, a special condition will be included in the DA permit to ensure no discharges of fill material in WUS within the Center Segment are allowed to occur unless and until ADOT 1) considers the information provided in the Komatke Area Drainage Master Study 2) conducts a drainage analysis acceptable to the Corps, 3) submits the drainage reports and hydrologic data to the Corps, and 4) receives written notice to proceed from the Corps. Since no downstream impacts would be occurring and all existing flow patterns and drainage configurations would

preserved, there would likely be little to no impact on the projects proposed in the Komatke Area Drainage Master Plan.

Summary of Findings

A review of new information and changed conditions indicates that no supplemental EIS analysis is warranted. The proposed changes are limited in scope and impacts are all within or adjacent to the footprint analyzed in the FEIS. The preferred alternative and its related impacts would not significantly change as a result of design of the project or modifications made since the issuance of the FEIS.

APPENDIX A
FEIS REEVALUATIONS

LOOP 202
South Mountain
Freeway

South Mountain Freeway FEIS/ROD Reevaluation #2

in Maricopa County, Arizona



Federal Highway Administration

ADOT

Arizona Department of Transportation

June 20, 2016

Federal-aid Project Number: NH-202-D(ADY)

ADOT Project Number: 202L MA 054 H8827 01D

Record of Decision

June 20, 2016

The Federal Highway Administration (FHWA), in coordination with the Arizona Department of Transportation (ADOT), reevaluated the South Mountain Freeway, Interstate 10 (I-10, Papago Freeway) to I-10 (Maricopa Freeway) Final Environmental Impact Statement and Record of Decision per 23 Code of Federal Regulations § 771.129 to address the clearance of remainder parcels outside the right-of-way footprint analyzed during the National Environmental Policy Act process. FHWA, with concurrence from ADOT, has determined that no substantial changes have occurred in the social, economic, or environmental impacts of the proposed action that would substantially impact the quality of the human, socioeconomic, or natural environment. Therefore, the original environmental document remains valid for the proposed action. It is recommended that the project identified herein be advanced to the next phase of project development.

Robert Samour

Robert Samour, PE
Senior Deputy State Engineer
Arizona Department of Transportation

6/20/16

Date

Karla S. Petty

Karla S. Petty
Arizona Division Administrator
Federal Highway Administration

6/20/16

Date

Table of Contents

List of Acronyms and Abbreviations.....	iii
1. Introduction and Project Description.....	1
Project Location	1
Approved Environmental Documentation.....	1
Previously Identified Impacts	3
Public and Agency Involvement	4
2. Description of Project Changes.....	6
3. Environmental Consequences.....	12
Corridor-wide Analysis	12
Geographical Area Analysis.....	15
Area 1 – I-10 commercial properties	15
Area 2 – Rio Del Rey residential properties	18
Area 3 – Salt River aggregate mining property	20
Area 4 – Laveen agricultural, residential, and utility corridor properties.....	21
Area 5 – Dusty Lane residential and utility corridor properties.....	24
Area 6 – South Mountains vacant properties	29
Area 7 – West Pecos Road residential properties.....	30
Area 8 – Mountain Park Church utility corridor property	32
Area 9 – Lakewood residences outside Project ROW	33
Summary of commitments related to Remainder Parcels.....	34
4. Public/Agency Outreach	36
5. Conclusion and Recommendation	37
Conclusion	37
Recommendation	37
Appendix A – Remainder Parcel Site Maps	
Appendix B – Section 106 Consultation Information	
Appendix C – Farmland Conversion Impact Rating for Corridor Type Projects	

List of Tables

Table 1. Environmental Consequences Assessment, Remainder Parcels	12
Table 2. I-10 Commercial Properties	16
Table 3. Rio Del Rey Residential Properties.....	19
Table 4. Salt River Aggregate Mining Property.....	20
Table 5. Laveen Agricultural, Residential, and Utility Corridor Properties	22
Table 6. Dusty Lane Vacant Land in Utility Corridor	25
Table 7. Dusty Lane SFR or Vacant Land (non-utility corridor)	26
Table 8. South Mountains Vacant Properties	29
Table 9. West Pecos Road Residential Properties	31
Table 10. Mountain Park Church Utility Corridor Property	32
Table 11. Lakewood Residences Outside Project ROW	33

List of Figures

Figure 1. Project Location Map	2
Figure 2. Remainder Parcel Overview Map, Western Section, North.....	8
Figure 3. Remainder Parcel Overview Map, Western Section, South	9
Figure 4. Remainder Parcel Overview Map, Eastern Section, West	10
Figure 5. Remainder Parcel Overview Map, Eastern Section, East	11

List of Acronyms and Abbreviations

ADOT	Arizona Department of Transportation
AG	agricultural
AGFD	Arizona Game and Fish Department
ASM	Arizona State Museum
BIA	United States Bureau of Indian Affairs
CAT	Citizens Advisory Committee
C.F.R	Code of Federal Regulations
CRMP	Cultural Resource Management Program
DEIS	Draft Environmental Impact Statement
EIS	environmental impact statement
EPA	United States Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
HDR	HDR Engineering, Inc.
I-10	Interstate 10
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
PA	Programmatic Agreement
ROD	Record of Decision
ROW	right-of-way
SFR	single family residence
SHPO	State Historic Preservation Office
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
Western	Western Area Power Administration

1. Introduction and Project Description

The Federal Highway Administration (FHWA), in coordination with the Arizona Department of Transportation (ADOT), conducted a reevaluation of the South Mountain Freeway, Interstate 10 (I-10, Papago Freeway) to I-10 (Maricopa Freeway) Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) per 23 Code of Federal Regulations (CFR) § 771.129 to address the addition of remainder parcels to the Project right-of-way (ROW) since the approval of the ROD on March 5, 2015. In the context of this reevaluation, a remainder parcel is defined as land outside of the ROW footprint analyzed in the FEIS/ROD. In most instances, only a part of a parcel was needed for the project, but the part of the parcel not needed for the project was acquired because it was no longer economically viable for the owner or the cost to remedy the damages to the value of the remainder parcel was greater than the cost of the remainder parcel itself; however in some situations, at the owners request, ADOT may acquire the ROW footprint parcel and not pursue the acquisition of the remainder parcel. In all cases, the acquisition was completed in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended. This reevaluation document provides an overview of the freeway project, describes the remainder parcels, assesses the environmental consequences of the remainder parcels, describes past and future public and agency outreach, and presents a conclusion related to the inclusion of the remainder parcels in the freeway project.

Project Location

ADOT is the sponsor of the construction and operation of the South Mountain Freeway. The freeway will constitute a section of the Regional Freeway and Highway System, the Loop 202 (also referred to as State Route 202L). The project is in the southwestern portion of the Phoenix metropolitan area in Maricopa County, Arizona (see Figure 1). The approximately 22-mile-long freeway will be constructed as an eight-lane divided, access-controlled facility, with four travel lanes in each direction. Three lanes will be for general purpose use and one lane will be dedicated to high-occupancy vehicle use.

Approved Environmental Documentation

The approved environmental documentation completed by ADOT, the project sponsor, and FHWA, the lead federal agency, included:

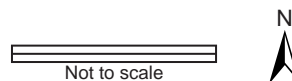
- ▶ Draft Environmental Impact Statement (DEIS) signed on April 16, 2013, and released to the public on April 26, 2013.
- ▶ FEIS signed on September 18, 2014, and released to the public on September 26, 2014.
- ▶ Errata to the FEIS signed on November 19, 2014 and released to the public on November 28, 2014 (the Errata was published to address public comments on the DEIS that were inadvertently omitted from the FEIS).



South Mountain Transportation Corridor
 Federal-aid Project Number: NH-202-D(ADY)
 ADOT Project Number: 202L MA 054 H5764 01C

Figure 1

Project Location Map



April 15, 2016

- ▶ ROD signed on March 5, 2015, and released to the public on March 13, 2015.
- ▶ South Mountain Freeway FEIS/ROD Reevaluation (#1) signed February 19, 2016 addressed the addition of a local street connector and a pedestrian bridge

Clarification of Reevaluation #1

In the Reevaluation document signed February 19, 2016, at the end of the introduction to Section 2, *Description of Project Changes*, it states that the additional scope items were requested by the City of Phoenix after the ROD. ADOT and FHWA would like to clarify that the requests were made by the City of Phoenix during the public comment period of the DEIS and FEIS, not after the ROD. FHWA and ADOT made the decision to include the additional scope items after the ROD, which is consistent with ROD commitment SOC-4 allowing the ability to evaluate additional features during design.

Previously Identified Impacts

The FEIS and ROD present a detailed description of anticipated impacts related to the Selected Alternative. Key elements are listed below. This reevaluation will cover impacts beyond those previously disclosed.

- ▶ The project will convert approximately 1,813 acres of land to a transportation use.
- ▶ The project is consistent with local and regional plans; however, it will introduce visual and noise intrusion adjacent to residential neighborhoods.
- ▶ Implementation of the project in the Western Section will result in adverse impacts on populations protected under Title VI and the environmental justice Executive Order; impacts will not, however, be disproportionately high or cause undue hardship when compared with such impacts on the general population.
- ▶ The project will result in the displacement of approximately 168 single-family homes, two apartment complexes with 680 total units, and 42 businesses.
- ▶ The City of Phoenix will experience an inconsequential reduction of annual property and sales tax revenue due to the conversion of land to a transportation use. Travel time savings for motorists in the region after completion of the project will be over \$200 million per year (in 2013 dollars).
- ▶ The project will not result in any exceedances of the health-based National Ambient Air Quality Standards.
- ▶ The project will require the placement of noise barriers in selected locations to reduce noise to levels that meet ADOT policy and FHWA regulations.
- ▶ The project will affect up to 121 water wells and 94 acres of floodplains.
- ▶ The project will impact Waters of the United States and require appropriate permitting

approvals from the U.S. Army Corps of Engineers (USACE).

- ▶ The project will not affect any currently listed threatened and endangered species. However, the project will result in the conversion of cover, nesting areas, and food resources for wildlife provided by the natural plant communities found in the Study Area. The project will create a physical barrier that could, depending on design, decrease movement of wildlife to and from the South Mountains and Sierra Estrella. In response, multifunctional crossing locations have been identified to provide habitat connectivity under the freeway.
- ▶ The project will affect a number of National Register of Historic Places (NRHP)-eligible prehistoric and historic sites and the South Mountains Traditional Cultural Property.
- ▶ The project will convert 723 acres of prime and unique farmlands to a transportation use.
- ▶ The project will interact with five high-priority hazardous materials sites.
- ▶ Impacts on views from residential and rural uses include construction impacts, new traffic interchanges, and visibility of the new facility. Impacts will not change the low-to-moderate visual quality of views along the freeway.
- ▶ The project will provide benefits related to regional energy consumption.
- ▶ The project will result in the direct use of resources in the South Mountains afforded protection by Section 4(f) of the Department of Transportation Act of 1966. There is no feasible and prudent alternative that avoids use of the South Mountains.

Public and Agency Involvement

ADOT and FHWA undertook an extensive public and agency involvement program during the National Environmental Policy Act (NEPA) phase of the project. Key elements included:

- ▶ Publication of the Notice of Intent on April 20, 2001, in the *Federal Register* (66[77]:20345).
- ▶ Invitations sent in 2001 to USACE, U.S. Environmental Protection Agency (EPA), U.S. Bureau of Indian Affairs (BIA), and U.S. Fish and Wildlife Service (USFWS) to be cooperating agencies were issued. USACE and BIA agreed to be federal cooperating agencies. EPA and USFWS declined. In 2009, the Western Area Power Administration (Western) was invited, and agreed, to be a cooperating agency.
- ▶ Agency scoping letters were sent to 232 federal, State, and local agencies in October 2001. A 2-day agency scoping meeting was held later that month in Phoenix. Agencies were invited to participate in the project through monthly progress meetings during the project duration.
- ▶ Public scoping was initiated in November 2001 and included presentations at 23 neighborhood meetings and two public meetings.
- ▶ Between the public scoping kick-off through the release of the DEIS, over 200 presentations were made to neighborhood groups, homeowners' associations, chambers of commerce, village planning committees, trade associations, and other interested parties. Twelve public meetings were held.

- ▶ ADOT created a Citizens Advisory Team (CAT) made up of groups and organizations in the Study Area. The CAT worked as a voluntary, advisory team to provide advice and input to ADOT and FHWA. Approximately 60 CAT meetings were held, each open to the public.
- ▶ The DEIS was released to the public on April 26, 2013, beginning the 90-day comment period (the minimum requirement under NEPA is 45 days). A public hearing was held May 21, 2013, at the Phoenix Convention Center from 10 a.m. to 8 p.m. Six community forums were held in Study Area communities to supplement the public hearing. Additionally, an online public hearing was created for those who could not attend a meeting in person. Approximately 900 people attended one of the public events, almost 1,900 unique visitors viewed information from the online hearing, and the project team received over 8,000 comments.
- ▶ The FEIS was released to the public on September 26, 2014. A 60-day review period was provided. As a result of the publication of the errata, ADOT and FHWA extended the review period to December 29, 2014. During the review period for the FEIS and errata, approximately 250 comments were received.
- ▶ ADOT and FHWA worked in close coordination with the Gila River Indian Community to hold a community forum on November 15, 2014, at the Boys & Girls Club, Gila River - Komatke. The Gila River Indian Community developed the agenda and facilitated the forum, which consisted of introductions, a description of the comment opportunities and court reporters' roles, an introduction to the South Mountain Freeway video flyover simulation, and an "open-microphone" comment period. Other than invited guests, the meeting was open to only Gila River Indian Community members. FHWA and ADOT project team members were guests at the forum and were in attendance to listen to comments. A translator was provided for those wishing to speak in the native O'odham language.

2. Description of Project Changes

The additional project scope item includes the addition of remainder parcels to the Project ROW footprint analyzed during the FEIS/ROD, as described below. The Project ROW footprint established in the FEIS/ROD defined the area needed to construct and operate the Selected Alternative. The ROW footprint did not follow parcel boundary lines. So in many cases, the ROW footprint cut across parcels leaving part of the parcel within the ROW footprint and part of the parcel outside of the ROW footprint. A determination as to whether the entire parcel or just the part of the parcel within the ROW footprint would be acquired was not made until ADOT began the ROW acquisition and relocation process after the ROD.

During the ROW acquisition and relocation process, ADOT identified 98 remainder parcels that are located outside of the Project ROW footprint analyzed in the FEIS/ROD. Categorical Exclusions (NEPA analysis) were completed for acquisition only for these parcels. This reevaluation is to review the effects of project activities related to these pieces of land, which could include demolition activities, use during the construction and maintenance phases of the project, and the disposal (sell or exchange) of the land during or after construction is complete. Demolition includes activities such as the removal of structures, parking lots, driveways, walls, and irrigated vegetation. The work is performed in conformance with the ROD commitments such as providing dust control, obtaining pertinent permits, protection of native vegetation, and response to address wildlife or cultural resources. During construction, these remainder parcels may be used as staging sites for construction personnel, equipment, or materials. Similarly after construction, remainder parcels may be used for transportation related activities. If the remainder parcels are not used for the project, ADOT will attempt to dispose the land per ADOT policies and procedures as described in Chapter 11 of the Property Management Section of the ADOT Right of Way Procedures Manual (2011).

The total area of the 98 remainder parcels outside the Project ROW is 508 acres, or approximately 28 percent of the Project ROW (for reference, the total Project ROW is approximately 1,800 acres). Maps showing the locations of the remainder parcels are provided in Figures 2, 3, 4, and 5. A site map for each parcel is included in Appendix A.

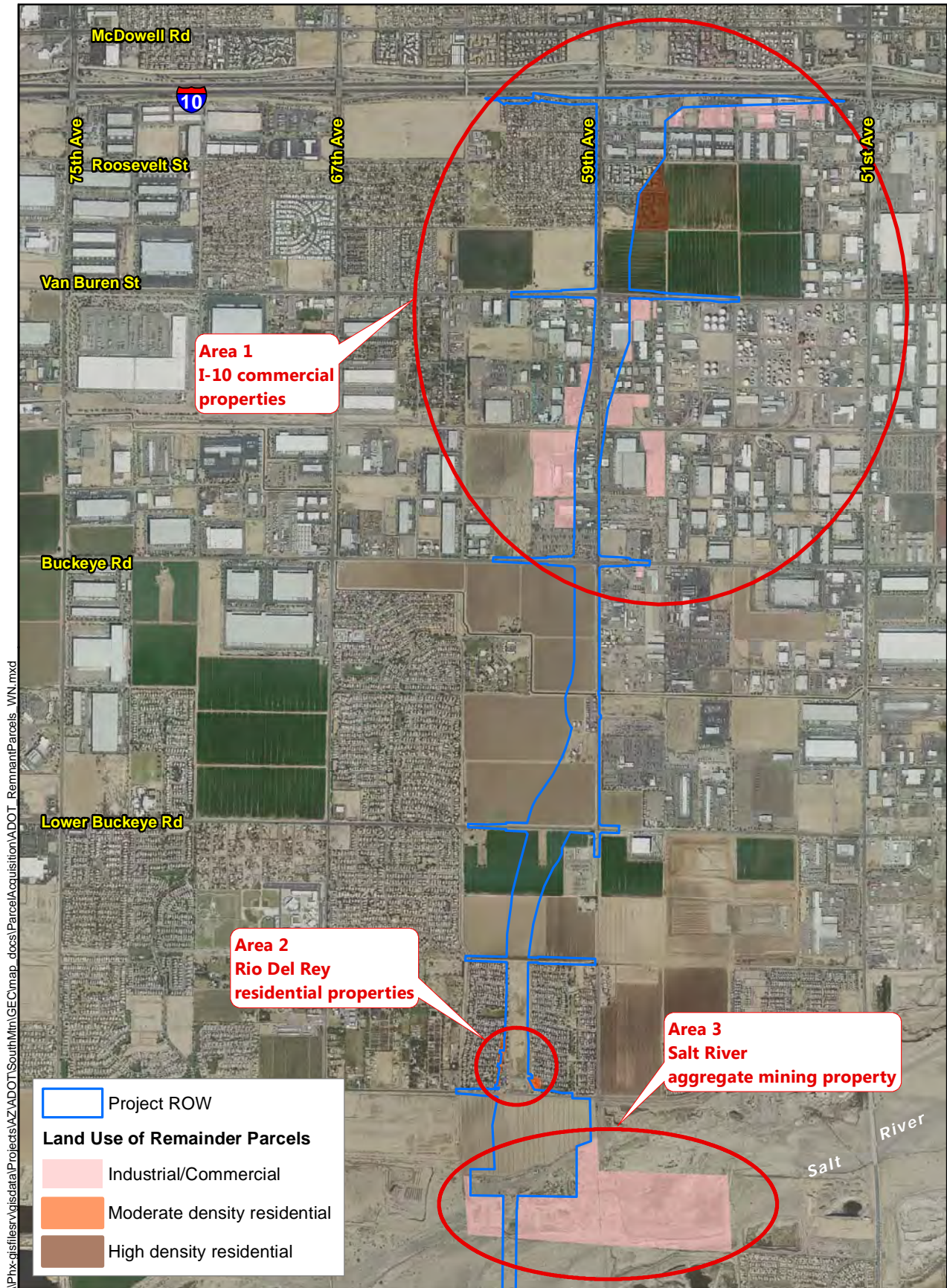
For the discussion of environmental consequences, the remainder parcels are grouped into nine geographic areas (see Figures 2, 3, 4, and 5) as the remainder parcels within each geographic area have similar characteristics.

Also, the remainder parcels fall into four categories:

1. Parcels that are entirely vacant and the remainder parcel is also vacant
2. Parcels that have built improvements within the Project ROW and the remainder parcel is

vacant

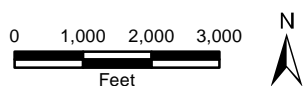
3. Parcels that have built improvements within both the Project ROW and the remainder parcel
4. Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW



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 Federal-aid Project Number: NH-202-D(ADY)
 ADOT Project Number: 202L MA 054 H5764 01C

Figure 2

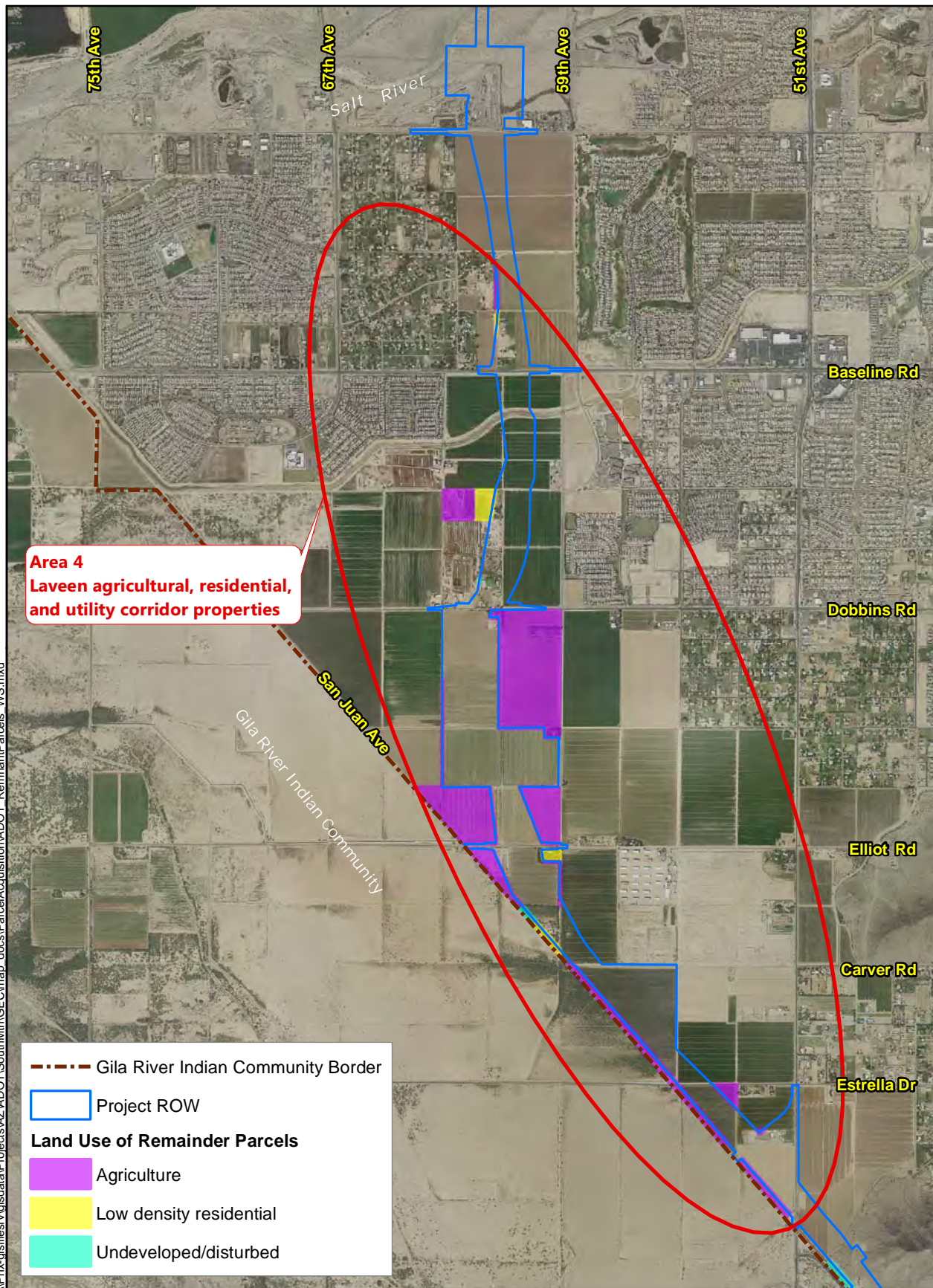
Aerial photography date: July 2013



**Remainder Parcel Overview Map
 Western Section, North**

May, 31, 2016

\\Phx-gisfilesrv\gisdata\Projects\AZ\ADOT\SouthMtn\GEC\map_docs\ParcelAcquisition\ADOT_RemnantParcels_WS.mxd



South Mountain Transportation Corridor
Federal-aid Project Number: NH-202-D(ADY)
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Figure 3

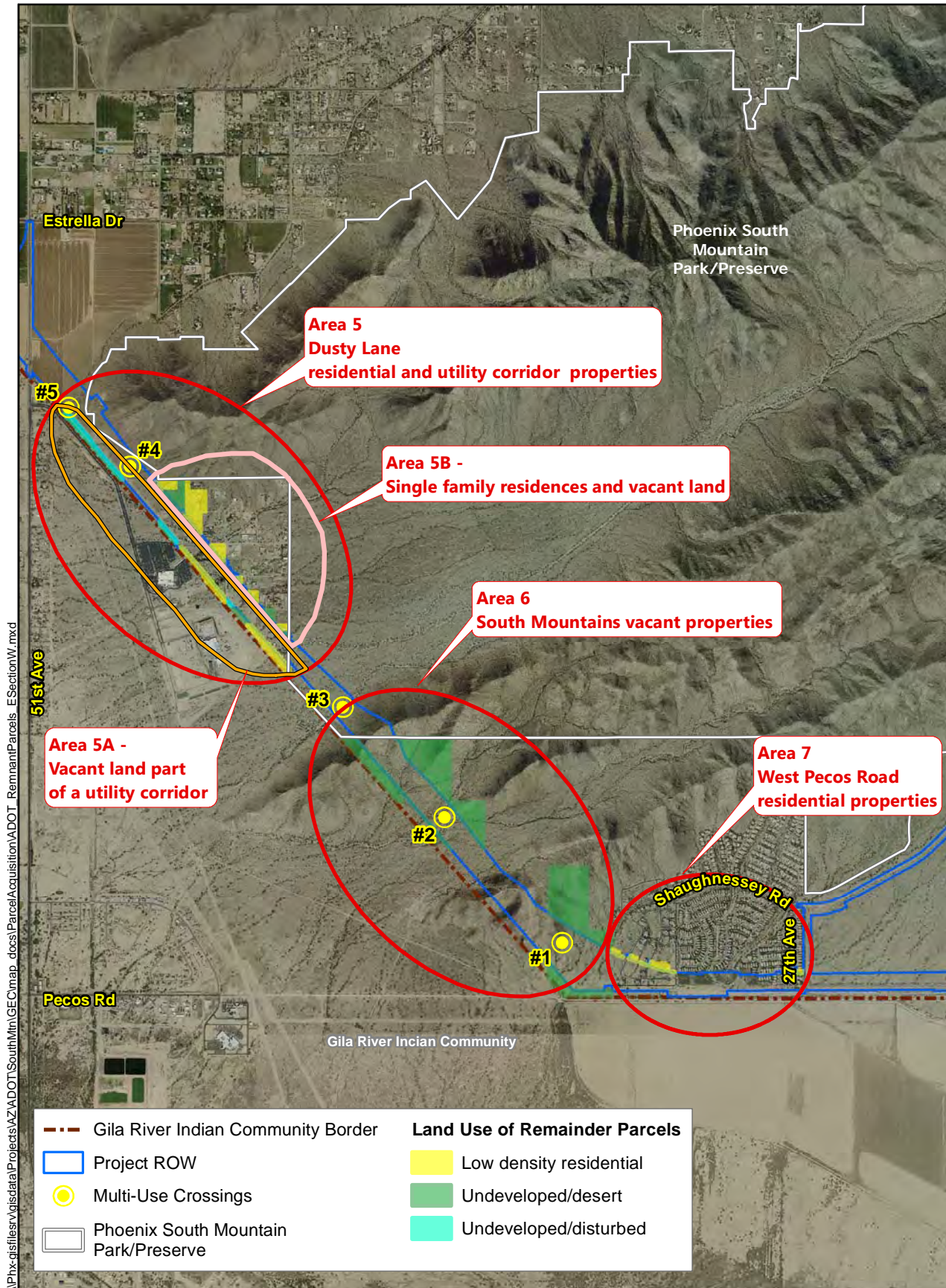
Aerial photography date: July 2013

0 1,000 2,000 3,000
Feet



Remainder Parcel Overview Map
Western Section, South

May, 31, 2016



South Mountain Transportation Corridor
Federal-aid Project Number: NH-202-D(ADY)
ADOT Project Number: 202L MA 054 H5764 01C

Figure 4

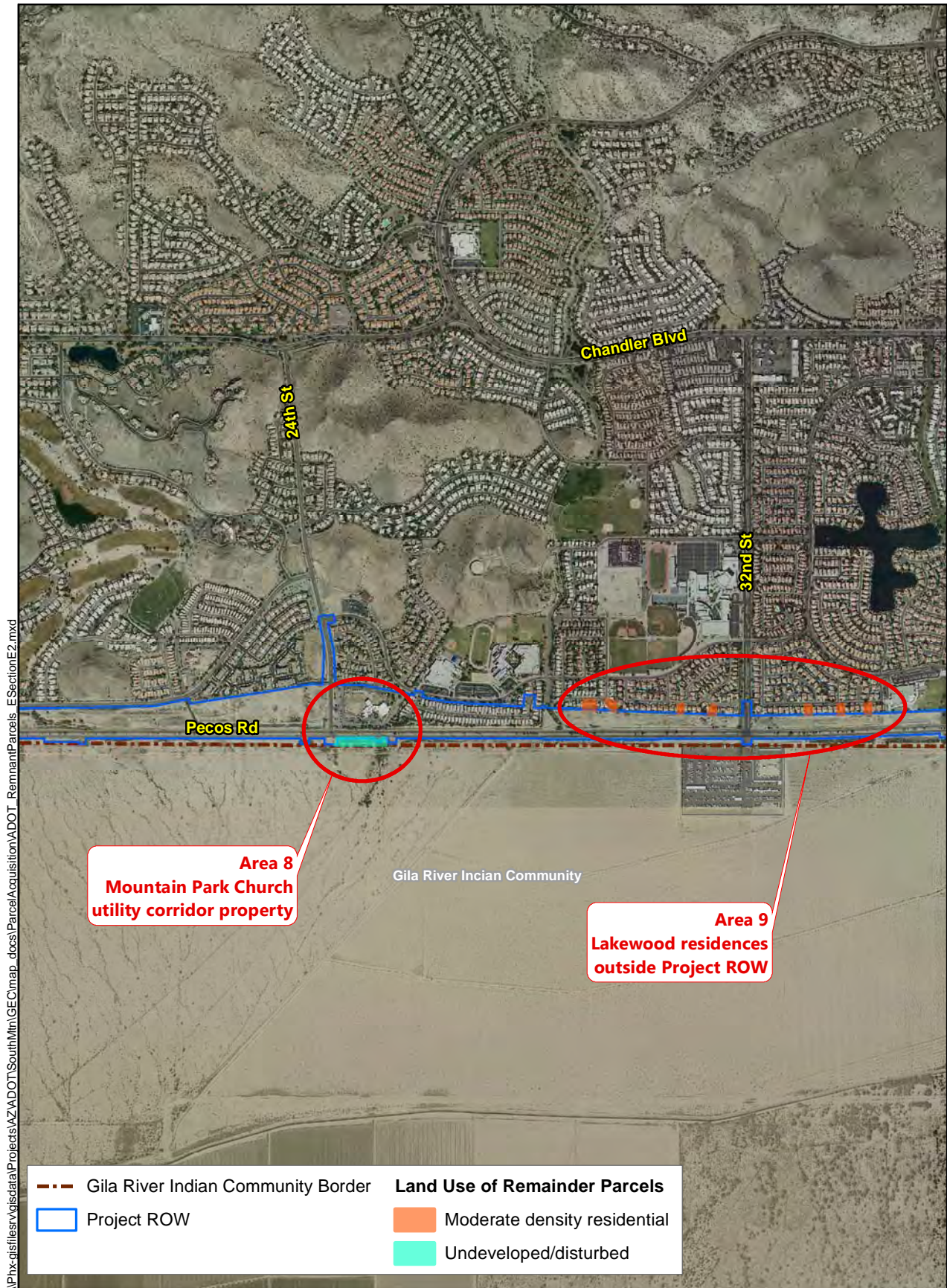
Aerial photography date: July 2013

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Feet



**Remainder Parcel Overview Map
Eastern Section, West**

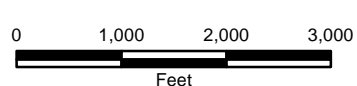
May, 31, 2016



South Mountain Transportation Corridor
Federal-aid Project Number: NH-202-D(ADY)
ADOT Project Number: 202L MA 054 H5764 01C

Figure 5

Aerial photography date: July 2013



Remainder Parcel Overview Map
Eastern Section, East

May, 31, 2016

3. Environmental Consequences

This section presents an analysis of environmental consequences at a corridor-wide level and then provides additional details within each of the nine geographical areas described in the previous section. All of the mitigation and commitments made in the FEIS and ROD for the project apply to the remainder parcels presented in this reevaluation.

Corridor-wide Analysis

The remainder parcels are all located adjacent to the ROW footprint analyzed during the FEIS/ROD. Table 1 and the following sections provide a corridor-wide assessment of the environmental impacts from the entirety of the remainder parcels. The Setting/Resource Circumstance column in Table 1 and the subsequent sections refer to the respective sections found in Chapter 4 of the FEIS.

Table 1. Environmental Consequences Assessment, Remainder Parcels					
Setting/Resource Circumstance	Change in Affected Environment		Change in Environmental Impact		Additional Discussion Included
	Yes	No	Yes	No	
Land Use		X	X		See discussion below
Social Conditions		X		X	
Environmental Justice and Title VI		X		X	
Displacements and Relocations		X	X		See discussion below
Economics		X		X	See discussion below
Air Quality		X		X	
Noise		X		X	
Water Resources		X		X	
Floodplains		X		X	
Waters of the United States		X		X	See discussion below
Topography, Geology, Soils		X		X	
Biological Resources		X	X		See discussion below and additional details in Geographical Area Analysis.
Cultural Resources		X	X		See discussion below and additional details in Geographical Area Analysis.

Table 1. Environmental Consequences Assessment, Remainder Parcels					
Setting/Resource Circumstance	Change in Affected Environment		Change in Environmental Impact		Additional Discussion Included
	Yes	No	Yes	No	
Prime and Unique Farmland		X		X	See discussion below
Hazardous Materials		X		X	See discussion below
Visual Resources		X		X	
Energy		X		X	
Temporary Construction Impacts		X		X	
Material Sources and Waste Material		X		X	
Secondary and Cumulative Impacts		X		X	
Section 4(f)/6(f)		X		X	See discussion below

Land Use

The remainder parcels are made up of 170 acres of agricultural, 227 acres of industrial/commercial, 43 acres of residential, and 68 acres of undeveloped land. The remainder parcels increase the acreage of the overall project by 508 acres or 28 percent; however, because it is anticipated that almost all of this land would be sold or disposed after construction, the extent of this impact is mainly temporary.

Displacements and Relocations

In the Dusty Lane area, there is a well located within the Project ROW that feeds a residential home outside of the Project ROW that ADOT anticipates acquiring (Parcel 7-11591; see page A-74 in Appendix A). This home was not accounted for in the displacements disclosed in the FEIS. All other displacements and relocations associated with the remainder parcels were disclosed in the FEIS.

Economics

The additional acreage of the remainder parcels would not substantially increase economic impacts from those disclosed in the FEIS/ROD because ADOT intends to dispose most of the remainder parcels; therefore, any economic impact related to removal of a land base from property or sales tax would be temporary and the property would either remain in its current land use or convert to another land use based on ownership and jurisdictional plans.

Waters of the US

Although there are waters of the US within remainder parcels, there will be no additional impacts beyond those disclosed in the FEIS because discharge of fill material in the Waters of the US outside of the ROW footprint is prohibited.

Biological Resources

Remainder parcels were evaluated to determine if the acquisition of the parcels would result in new effects or contribute to cumulative effects beyond those addressed in the FEIS. Remainder parcels represent an approximate increase of 13 percent in the total desert habitat land cover type for the South Mountain Freeway project, 129 percent for industrial/commercial, 26 percent for residential, 24 percent for agricultural, and 2 percent for disturbed vacant land.

The evaluation included obtaining information from the USFWS and Arizona Game and Fish Department (AGFD) species databases to update species lists. With the exception of the addition of proposed critical habitat for the yellow-billed cuckoo (*Coccyzus americanus*), the Mexican gray wolf (*Canis lupus baileyi*) 10(j) area, and the common chuckwalla (*Sauromalus ater*), the species and concerns were all addressed in the FEIS and Biological Evaluation. Proposed critical habitat for the yellow-billed cuckoo is over 2 miles from the project limits and the project area does not support suitable habitat for the Mexican gray wolf. Impacts to the common chuckwalla were referenced within the FEIS as general impacts to reptile species and subsequent coordination with the AGFD and Gila River Indian Community resulted in an agreement to have AGFD remove common chuckwalla from suitable rocky habitat prior to construction within that habitat. The following requirement is included in the contractual technical provisions for the Project: Developer shall notify ADOT 20 days prior to initiation of ground disturbing activities in all areas with suitable habitat for chuckwalla (rocky crevices or as defined by AGFD). ADOT will employ AGFD to relocate chuckwalla from the area during the 20 day period.

Impacts to remainder parcels located outside of the footprint would not alter the conclusions for the impacts to biological resources as discussed in the FEIS for the Project. There will be no new effects to species, habitat, or wildlife connectivity because the remainder parcels are adjacent to or near the habitat addressed in the EIS and the habitat in the remainder parcels do not include any unique characteristics. Also, the additional area for undeveloped Sonoran desertscrub habitat is small in relation to similar habitat in the corridor footprint and project area.

Cultural Resources

Survey for cultural resources was completed for the remainder parcels. Three archaeological sites were identified as reported in “*A Class III Cultural Resources Survey of 20 ADOT Parcels in Support of the 202L, South Mountain Freeway Project Environmental Impact Statement Reevaluation, Maricopa County, Arizona*” (Bartholomew and Brodbeck 2016). FHWA

determined site AZ T:12:14(PG) was eligible for listing on the NRHP under Criterion D and that sites AZ T:12:427[Arizona State Museum (ASM)] and AZ T:12:428(ASM) were ineligible for NRHP listing. The effects to historic properties will be mitigated per the Programmatic Agreement (PA) executed for the project on July 21, 2016. Consultation information and the PA are provided for reference in Appendix B.

Prime and Unique Farmlands

The Farmland Conversion Impact Rating for Corridor Type Projects form (NRCS-CPA-106) was resubmitted to the Natural Resources Conservation Service for scoring (see Appendix C). The updated scoring for the Selected Alternative including the remainder parcels was 159, which is below the 160-point threshold for protection consideration. This result is consistent with previous scoring and did not result in changes to the mitigation. ADOT intends to dispose most of the agricultural remainder parcels; therefore, the property would either remain in its current land use or convert to another land use based on ownership and jurisdictional plans.

Hazardous Materials

A Draft Initial Site Assessment for hazardous materials was completed in November 2012 and was updated in an addendum in June 2014 as part of the FEIS/ROD for the Project. Prior to personnel conducting or observing ground disturbing activities on high-risk areas, they shall possess a 40-hour HAZWOPER training/certification. Phase I environmental site assessments are being completed for each parcel.

Section 4(f) and 6(f)

Remainder parcels within Geographical Areas 5, 6, and 7 are within the administrative boundary of the South Mountains Traditional Cultural Property. The remainder parcels are an additional use of the TCP due to the increased area being acquired for the Project. However, the remainder parcels do not change the Section 4(f) analysis presented in the FEIS/ROD because the measures to minimize harm to the South Mountain TCPs will be implemented for these remainder parcels.

Geographical Area Analysis

Area 1 – I-10 commercial properties

Area 1 encompasses the portion of the project between I-10 and Lower Buckeye Road. It is primarily developed with industrial, commercial and multi-family land uses. There are 22 total parcels in this area with remainder parcels outside of the Project ROW, totaling 95.3 acres (see additional details in Table 2 and Appendix A beginning on page A-1). Four of these parcels are entirely outside of the Project ROW and will remain undisturbed by the Project. There are two other vacant parcels that will remain undisturbed by the project. The remaining parcels are

anticipated to require demolition activities. There is a potential for some of these remainder parcels to be used during construction for temporary field offices or lay-down yards, but after construction it is anticipated that all of this land would be disposed per ADOT policy and procedures.

Table 2. I-10 Commercial Properties						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-05933	ADOT	104-26-009	5737 W Buckeye Rd	Office	0.83	4
7-10600	ADOT	104-04-007	210 S 57th Dr	Vacant	1.76	4
7-10612	ADOT - Martinez	104-04-512	5715 W Van Buren St	Vacant	3.42	1
7-10784	ADOT	104-19-003E	445 S 59th Ave	Vacant	11.11	4
7-10906	ADOT	104-04-003	5727 W Van Buren St	Vacant	0.49	4
7-11323	ADC-Ridge at Sun Valley, LLC	103-28-004	801 N. 59th Avenue	Apartments	2.46	3
7-11426	Azejm Land Holdings LLC	103-27-061	1202 N 54th Ave	Warehouse	4.66	3
7-11438	Blue Beacon International Inc	103-27-062A	1235 N 57th Ave	Truck Wash	1.53	3
7-11459	Copper State Rubber of Arizona	104-18-004L, 104-18-004M, 104-18-008, 104-18-009, 104-18-010	740 S 59th Ave	Manufacturing Facility	1.63	3
7-11476	Denio's Roseville Farmers Market and Auction, Inc	104-05-004Z	224 N. 59th Ave	Storage Yard	1.14	3
7-11484	Dolphin Inc	104-05-001J, 104-05-011, 104-05-010B, 104-05-005A, 104-18-003N, 104-18-006A, 104-18-004H, 104-18-004S, 104-18-004N, 104-18-015	350 S 59th Ave	Industrial Manufacturing	32.13	3

Table 2. I-10 Commercial Properties						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-11500	59 NKW Properties LLC	104-04-045	249 S 59th Ave	Apache Rentals	6.91	3
7-11515	Gp Southwest	104-18-003G	842 S 59th Ave	Driver Training	1.48	3
7-11523	Ampj Hospitality Inc	103-27-028B	1242 N 53rd Ave	Motel	1.70	3
7-11542	JGZ Properties I LLC	104-18-003C	802 S 59th Ave	Commercial	3.68	3
7-11634	JMD Hospitality, LLC	103-27-029B	1241 N 53rd Ave	Motel	1.81	3
7-11669	Ryder Truck Rental Inc	103-27-017B, 103-27-018, 103-27-019, 103-27-020, 103-27-021B	1239 N 56th Ave	Truck Rentals	6.07	3
7-11691	SJW Land Company	104-04-013, 104-04-014, 104-04-015, 104-04-018	1 N 59th Ave	Refrigerated Warehouse	1.17	3
7-11696	Southwest Village Apartments LLC	103-28-003K	777 N 59th Ave	Apartments	9.54	3
7-11731	West Valley Storage Solutions LLC	103-27-027C	1239 N 54th Ave	Mini - Storage	1.05	3
7-11755	Rimex, Inc., a Nevada corporation	104-04-035	5801 W. Van Buren	Commercial Bldg.	0.43	2
7-11756	Southwest Village Investments I, LLC	103-28-003J	N/A	Vacant	0.29	1
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW						

Additional details related to cultural resources and biological resources include:

CULTURAL RESOURCES

With exceptions noted below, all of the remainder parcels within Area 1 are completely disturbed by modern development with no native ground surface remaining and as such, these

parcels were not surveyed for cultural resources. The historic building inventory performed for the EIS/ROD did not identify any historic buildings or structures.

Parcel 7-11756 is a vacant parcel and was surveyed for cultural resources by HDR Engineering (HDR). The results are reported in “*A Final Class III Survey of the W59 and E1 Alignments for the South Mountain Freeway, Maricopa County, Arizona*” (Brodbeck 2015). Section 106 consultation was conducted and SHPO concurred with the adequacy of the report (Petty [FHWA] to Jacobs [State Historic Preservation Office {SHPO}] July 23, 2015, SHPO concurrence July 29, 2015).

Parcels 7-10600, 7-10612, 7-10784, and 7-10906 are vacant lots that were surveyed for cultural resources. The results are reported in “*A Class III Cultural Resources Survey of 20 ADOT Parcels in Support of the 202L, South Mountain Freeway Project Environmental Impact Statement Reevaluation, Maricopa County, Arizona*” (Bartholomew and Brodbeck 2016). SHPO concurred with the adequacy of the report (Petty [FHWA] to Jacobs [SHPO] March 28, 2016, SHPO concurrence April 5, 2016).

BIOLOGICAL RESOURCES

With exceptions noted below, all of these remainder parcels are completely developed; vegetation is generally absent and the parcels have limited value for wildlife.

Parcel 7-11756 is a vacant, cleared area adjacent to an apartment complex to the north and a farm field to the south. Vegetation occurs in a small depression that includes weedy species and grasses. The property has little value for wildlife. Parcel 7-10612 is a vacant, cleared lot bordered by industrial development and an agricultural field. Water collects in low patches where weedy species and a number of small mesquite trees are growing. Landscape trees border the parcel. This parcel has limited value for wildlife but likely provides habitat for some lizards and birds. Parcel 7-10784 is a vacant, cleared lot within an industrial development. Patches of weedy species grow in low areas that collect water and a few trees grow along an abandoned railroad spur. This parcel has limited value for wildlife but likely provides some habitat for some lizards and birds. Parcel 7-10906 is a vacant, cleared lot bordered by industrial development and an agricultural field. Vegetation includes weedy species and a number of small paloverde trees. Landscape trees border one end of the parcel. This parcel has limited value for wildlife but likely provides habitat for some lizards and birds. Parcel 7-10600 is a vacant, cleared lot within an industrial development. Patches of weedy species grow in low areas that collect water. This parcel has limited value for wildlife.

Area 2 – Rio Del Rey residential properties

Area 2 encompasses the single-family residential neighborhood just north of Broadway Road on each side of the Project ROW. There are 10 total parcels in this area with remainder parcels

outside of the Project ROW, totaling 1.0 acres (see additional details in Table 3 and Appendix A beginning on page A-24). All of these parcels are planned for demolition. The remainder parcels are non-economical remnants and will most likely remain in ADOT ownership after construction. If the parcels remain in ADOT's possession after construction they would be landscaped and maintained along with the adjacent Project ROW.

Table 3. Rio Del Rey Residential Properties						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-11516	Granado Luz Adriana	104-57-051	6201 W Encinas St	SFR ^b	0.07	3
7-11522	Felipe N. Oblea and Erika Gallardo De Negrete,	104-57-239	4227 S 61st Ave	SFR	0.17	3
7-11532	Hoffman Sandra	104-57-076	6202 W Encinas Ln	SFR	0.13	3
7-11553	Kenneth C. Kilgore, Jr. and Machele Kilgore,	104-57-238	4232 S. 61st Avenue	SFR	0.15	3
7-11566	Bailey, Colette	104-57-077	6201 W Southgate Ave	SFR	0.13	3
7-11582	Lopez Melissa D/Bravo Alan R	104-57-025	6201 W Wood St	SFR	0.01	3
7-11589	Maricopa Rentals Limited Partnership	104-57-050	6202 W Wood St	SFR	0.05	3
7-11613	Laura Nava,	104-57-236	4239 S. 61st Avenue	SFR	0.11	3
7-11637	Perez Felipe/Lucia M	104-57-023	6206 W Pueblo Ave	SFR	0.04	3
7-11672	SS 1 Holding -2 LLLP,	104-57-237	4235 S. 61st Avenue	SFR	0.14	3
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW ^b single family residence						

Additional details related to cultural resources and biological resources include:

CULTURAL RESOURCES

The remainder parcels in Area 2 are completely disturbed residential development with no native ground surface remaining; as such, they were not surveyed for cultural resources.

BIOLOGICAL RESOURCES

The remainder parcels are single family residences within a suburban neighborhood with limited landscaped vegetation that have limited value for wildlife.

Area 3 – Salt River aggregate mining property

Area 3 encompasses a sand and gravel mining property located between 51st and 63rd avenues on the north side of the Salt River (see additional details in Table 4 and Appendix A beginning on page A-35). The remainder land from this single parcel (7-11716) is 144.4 acres and falls east and west of the freeway. The land has been previously disturbed by mining but is no longer an active mining area. No demolition activities are anticipated. ADOT intends to retain the remainder property in the current condition after construction as protection against future mining in the river bed near the freeway.

Table 4. Salt River Aggregate Mining Property						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category ^a
7-11716	Union Rock & Materials Group	104-65-001, 104-65-002D, 104-65-004B, 104-65-002C	4802 S 59th Ave	Mining/ river bed	57.44	3
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW						

Additional details related to cultural resources and biological resources include:

CULTURAL RESOURCES

Parcel 7-11716 was partially surveyed for cultural resources by the Gila River Indian Community Cultural Resource Management Program (CRMP). The results are reported in “*A Class III Cultural Resource Survey of Five Alternative Alignments in the South Mountain Freeway Corridor Study Area, Maricopa County, Arizona*” (Darling 2005). SHPO previously concurred with the adequacy of the report (Jacobs [SHPO] to Greenspan [ADOT, January 23, 2006). The remainder of the parcel was surveyed by SWCA, Inc., Environmental Consultants as part of a separate undertaking. The results of the SWCA survey are reported in *Archaeological*

Survey at Pioneer Concrete's 59th Avenue Site, Maricopa County, Arizona (Mitchell and Ryden 2001). Prior consultation for this report was not available.

BIOLOGICAL RESOURCES

The property is part of the dry Salt River main channel and riverbank that has been heavily disturbed by gravel mining. This area is mainly gravel and sand with little vegetation present. Some plants typically found in the Sonoran creosote desertscrub community are present in low densities. These include mesquite and creosotebush (*Larrea tridentata*), as well as a larger number of weedy species such as tamarisk (*Tamarix* sp.), burrobrush (*Ambrosia dumosa*) desert broom (*Baccharis sarothroides*), common sunflower (*Helianthus annuus*), carelessweed (*Amaranthus palmeri*), and prickly Russian thistle (*Salsola tragus*).

Although heavily altered, the parcel provides some habitat for a variety of wildlife due to its location within the Salt River channel. The Salt River, which is identified as a potential wildlife linkage zone and is addressed within the FEIS, is important for maintaining wildlife movement and dispersal through the area. Western burrowing owls (*Athene cunicularia*), which are protected by the Migratory Bird Treaty Act and have been identified by the AGFD as a Species of Greatest Conservation Need, may have burrows in this area. Due to its location along and within the Salt River, the parcel will not be developed and will be allowed to grow vegetation naturally or eventually be incorporated into the Rio Salado Oeste habitat restoration project that would increase the parcel's value to wildlife over time.

Area 4 – Laveen agricultural, residential, and utility corridor properties

Area 4 encompasses the area between Southern Avenue and 51st Avenue. There are 15 total parcels in this area with remainder parcels outside of the Project ROW, totaling 182.3 acres (see additional details in Table 5 and Appendix A beginning on page A-37). These parcels are mixed among parcel categories 1, 2, and 3. There is a potential for some of these remainder parcels to be used during construction for temporary field offices or lay-down yards, but after construction it is anticipated that all of this land would be disposed. Structures that are in disrepair or a safety hazard may be demolished prior to disposal.

Table 5. Laveen Agricultural, Residential, and Utility Corridor Properties

ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-11182	ADOT - La Salvia	300-02-031A, 300-02-032A, 300-02-033, 300-02-034, 300-02-037A, 300-02-037B, 300-02-038, 300-02-041, 300-02-042, 300-03-016D	NA ^b	AG ^c (SFR ^d)	143.13	3
7-11316	ADOT	300-02-021G	NA	Vacant	9.99	4
7-11462	Ellis & Williams	300-03-016J	5901 W Elliot Rd.	SFR	1.20	3
7-11492	Edwards Paul F/Melanie A	300-03-018F, 300-03-018G	11202 S. 59th Ave.	SFR / Business	1.73	3
7-11494	Erran Gary J/Shai	300-03-016H	10828 South 59th Avenue	SFR	0.59	3
7-11499	Wild Paw Enterprises, LLC	300-02-021F	8444 S. 61st Ave	SFR	6.77	3
7-11502	Michael Foerst	300-02-021H	6104 W. Dobbins	SFR	0.01	2
7-11554	Kloeber Family Trust	300-03-019D	12722 S. 51st Avenue	SFR / Business	0.17	2
7-11558	KS LLC	300-03-016E	NA	AG	0.89	1
7-11575	Lines Brothers Land & Cattle LLC	104-86-002H	6015 W. Vineyard	AG	1.04	1
7-11576	Lines (family)	300-03-019G, 300-03-20A, 300-03-023F; 300-07-002B, 300-07-010D, 300-07-011	12432 S. 51st Avenue	AG	3.79	1
7-11610	Moss Michael L/Kathy A	104-86-001R	7221 S. 61st Dr	SFR	0.09	2
7-11611	Moss Michael L/Kathy A	104-86-001P	NA	Vacant	0.28	1

Table 5. Laveen Agricultural, Residential, and Utility Corridor Properties						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-11704	Taylor Morrison / Arizona, Inc	300-03-002A, 300-03-032, 300-03-037, 300-03-021	NA	AG	12.16	1
7-11786	Daniel C. Kohn	300-03-016F	5919 West Elliot Road	SFR	0.47	3
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW ^b not applicable; ^c agricultural; ^d single family residence						

Additional details related to cultural resources and biological resources include:

CULTURAL RESOURCES

The parcels in Area 4 were surveyed for cultural resources by CRMP and HDR. The results of the surveys are reported in “*A Class III Cultural Resource Survey of Five Alternative Alignments in the South Mountain Freeway Corridor Study Area, Maricopa County, Arizona*” (Darling 2005), “*An Addendum Cultural Resources Report for the 202L, South Mountain Freeway EIS & L/DCR Project, Maricopa County, Arizona*” (Brodbeck and Pratt 2005) , “*A Class I and Class III Cultural Resource Survey for the Proposed Western Transmission Line Realignment, in Support of the South Mountain Loop 202 Alignment, in the Gila River Indian Community, the Unincorporated Community of Laveen and the City of Phoenix, Maricopa County, Arizona*” (McCool and Loendorf 2012), and “*A Final Class III Survey of the W59 and E1 Alignments for the South Mountain Freeway Project, Maricopa County, Arizona*” (Brodbeck and others 2015). SHPO previously concurred with adequacy of these reports through Section 106 consultation (Jacobs [SHPO] to Greenspan [ADOT, January 23, 2006; Greenspan [ADOT] to Jacobs [SHPO] September 29, 2005, SHPO concurrence October 3, 2005; Petty [FHWA] to Jacobs [SHPO] October 31, 2012, SHPO concurrence November 5, 2012; Petty [FHWA] to Jacobs [SHPO] July 23, 2015, SHPO concurrence July 29, 2015).

Parcel 7-11499 was partially surveyed for cultural resources by CRMP as reported in “*A Class III Cultural Resource Survey of Five Alternative Alignments in the South Mountain Freeway Corridor Study Area, Maricopa County, Arizona*” (Darling 2005). The remainder of the property was surveyed by HDR (Brodbeck and others 2015). SHPO concurred with the adequacy of both reports (Jacobs [SHPO] to Greenspan [ADOT, January 23, 2006; Petty [FHWA] to Jacobs [SHPO] July 23, 2015, SHPO concurrence July 29, 2015).

BIOLOGICAL RESOURCES

There are varying conditions as noted below, however due to human use, these parcels have limited value for most wildlife. Mammal species that may use the existing habitat include various rodent and skunk species, gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), javelina (*Tayassu tajacu*), and mule deer (*Odocoileus hemionus*). Nesting migratory birds may use the trees, burrowing owls may use banks of irrigation canals, and various protected bats and reptiles may use outbuildings on agricultural parcels. Details of the parcels with significant vegetation present are as follows:

- ▶ Parcels 7-11462 and 7-11494 are heavily wooded with mature landscape trees; they are isolated residential parcels located adjacent to each other and surrounded by agricultural land.
- ▶ Parcels 7-11492, 7-11502, and 7-11786 are low-density, rural residential parcels surrounded by agricultural land uses.
- ▶ Parcel 7-11558 is an agricultural parcel in which the remnant land is encumbered by a utility easement.
- ▶ Parcel 7-11316 is moderately to heavily wooded with various aged trees that have been previously removed in sections and in the eastern third have grown to a mature stage; it is a vacant parcel completely outside of the Project ROW and surrounded by agricultural land.

In accordance with the commitments in the FEIS/ROD, surveys for migratory birds, burrowing owls, reptiles, and bats will be conducted as warranted according to the habitat present on these parcels.

Area 5 – Dusty Lane residential and utility corridor properties

Area 5 encompasses the single-family residential neighborhood just east of 51st Avenue along Dusty Lane. There are 25 total parcels in this area with remainder parcels outside of the Project ROW, totaling 22.6 acres (see additional details in Table 6, Table 7, and Appendix A beginning on page A-53). The remnant parcels in this area have been subdivided based on those that are west of the freeway (Area 5A- vacant land part of a utility corridor) and east of the freeway (Area 5B - single family residences and vacant land).

AREA 5A – VACANT LAND IN UTILITY CORRIDOR

Area 5A is made up of 11 parcels (see additional details in Table 6 and Appendix A beginning on page A-53). The remainder parcels are a narrow strip of partially disturbed land that includes an overhead high voltage transmission line and underground water line corridor. No demolition or construction will occur within these remainder parcels. Because of the utility corridor, these remainder parcels have no economical value. Unless the utility owner decides to acquire the

remainder parcels from ADOT, the remainder parcels will remain in their current state in ADOT ownership after construction.

Table 6. Dusty Lane Vacant Land in Utility Corridor						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-11481	Robert & Candice Diaz	300-04-051, 300-04-002D	4543 W Ivanhoe St.	SFR ^b	0.30	1
7-11565	Walter Lay	300-04-021A	4601 W Sandy Rd	SFR	0.56	1
7-11616	Nathan Family Trust / Stephen & Martha Nathan	300-07-003F	14801 S 27th Ave	Vacant	1.49	1
7-11619A	Arthur & Carmina Nephew (Parcel 1)	300-04-028J	15004 S. 43rd Ave	SFR	0.50	2
7-11619B	Arthur & Carmina Nephew (Parcel 2)	300-04-028K	15004 S. 43rd Ave	SFR	1.72	2
7-11640	City of Phoenix	300-07-003L	4847 W Dusty Lane	Vacant	0.48	1
7-11650	Eleazar & Guadalupe Ramirez; Ernesto Ramirez	300-04-054	14800 S. 45th Ave	SFR	1.06	2
7-11702	ADOT	300-04-028L	15030 S 43rd Ave	SFR	0.69	2
7-11724	Richard & Teresa Villa	300-04-053	14600 S. Dusty Lane	SFR	0.38	2
7-11740	David Olivarez & Jack Strong. Jack Strong Revocable Trust	300-07-003R	NA	Vacant	0.46	1
7-11913	City of Phoenix	300-04-017V, 300-04-050	14717 S 45th Ave	Vacant	0.77	1
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW ^b single family residence						

Additional details related to cultural resources and biological resources include:

Cultural Resources

The parcels in Area 5 were surveyed for cultural resources by CRMP. The results are reported in *“A Class III Cultural Resource Survey of Five Alternative Alignments in the South Mountain*

Freeway Corridor Study Area, Maricopa County, Arizona” (Darling 2005). SHPO concurred with the adequacy of the report (Jacobs [SHPO] to Greenspan [ADOT, January 23, 2006).

Biological Resources

The remainder parcels are located between a low-density rural neighborhood and the Gila River Indian Community’s casino property adjacent to Dusty Lane. The remainder parcels include an overhead high voltage transmission line corridor. The construction, maintenance access, and vehicular traffic associated with the powerline and Dusty Lane has resulted in highly disturbed vegetation and soils in this area. Vegetation is mostly sparse and although native plant species such as creosotebush, mesquite and a small number of saguaros (*Carnegiea gigantea*) are present, the soils are highly disturbed. The parcels provide habitat for some species, including reptiles, birds, and small mammals such as rodents and rabbits. Larger mammals such as coyote, bobcat, and javelina may move through the parcels to access habitat in the vicinity.

Since the remainder parcels are part of a utility corridor and there are no plans to perform any demolition or construction within these parcels, there will be no additional effects on wildlife that may use or cross the remainder parcels beyond those identified in the FEIS/ROD.

AREA 5B - SFR OR VACANT LAND (NON-UTILITY CORRIDOR)

Area 5B is made up of 14 parcels (see additional details in Table 7 and Appendix A beginning on page A-65). These parcels are mixed among parcel categories 1, 2, and 3. There is a potential for some of these remainder parcels to be used during construction for temporary field offices or lay-down yards, but after construction it is anticipated that all of this land would be disposed. Structures that are in disrepair or a safety hazard may be demolished prior to disposal.

Table 7. Dusty Lane SFR or Vacant Land (non-utility corridor)						
ADOT Parcel No.	Owner’s Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-11437	Dennis Berube	300-04-017X	4418 W Galveston St	SFR ^b	0.01	2
7-11450	Marcelino Corona Sanchez & Micaela Vasquez	300-04-025A	15000 S. 43rd Ave	Vacant with well on parcel 2	0.03	1
7-11460	Tomas & Maria Cortez	300-04-021E	4544 W Ivanhoe St	SFR	0.04	3
7-11463	Robert & Maia Crawley	300-04-017S, 300-04-017U	4427 W Monterey St	SFR / Vacant	0.08	2

Table 7. Dusty Lane SFR or Vacant Land (non-utility corridor)						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-11490	Vivian Durazo; Gregorio Robles; Maria Martinez	300-04-049	NA	Vacant	0.66	1
7-11520	Charlie Hamilton & Debora Pinkham	300-04-021G	4607 W Sandy Rd	SFR	0.41	3
7-11556	Troy Koile	300-04-002B	14405 S. 45th Ave	SFR	1.11	3
7-11580	Brian & Ellen Loehnis	300-04-002E	14428 S. 45th Ave	SFR	0.01	2
7-11591	Desiderio & Kathryn Marquez	300-04-003J, 300-04-003K	4535 W Ray Rd	SFR with well	3.95	3
7-11618	Harold & Crystal Nelson, Trustees of the Harold & Crystal Nelson Revocable Trust	300-04-024A	14910 S. 43rd Ave	SFR	0.50	3
7-11620	Roy New Successor Trustee of the New Family Irrevocable Trust	300-04-003C	4631 W Ray Rd	SFR with well	2.16	3
7-11636	Enrique Pena	300-04-017Y	4410 W Galveston St	SFR	0.42	3
7-11676	Harry Sanaski	300-04-003H	NA	Vacant with well	3.44	1
7-11735	Stephen & Ellen Zalecki	300-04-021C	4545 W Sandy Lane Dr	SFR	1.36	3
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW ^b single family residence						

Additional details related to cultural resources and biological resources include:

Cultural Resources

HDR surveyed a portion of Parcel 7-11676 which had not been previously covered. The results

are reported in “*A Class III Cultural Resources Survey of 20 ADOT Parcels in Support of the 202L, South Mountain Freeway Project Environmental Impact Statement Reevaluation, Maricopa County, Arizona*” (Bartholomew and Brodbeck 2016). SHPO concurred with the adequacy of the report (Petty [FHWA] to Jacobs [SHPO] March 28, 2016, SHPO concurrence April 5, 2016).

The remainder of the parcels in Area 5B was surveyed for cultural resources by CRMP. The results are reported in “*A Class III Cultural Resource Survey of Five Alternative Alignments in the South Mountain Freeway Corridor Study Area, Maricopa County, Arizona*” (Darling 2005). SHPO concurred with the adequacy of the report (Jacobs [SHPO] to Greenspan [ADOT], January 23, 2006).

Biological Resources

The parcels are part of a low-density rural neighborhood with some parcels adjacent to the Phoenix South Mountain Park/Preserve. Some parcels include primarily the residential buildings and outbuildings and others are undisturbed Sonoran desertscrub that include vegetation that is characterized as low quality Sonoran desert tortoise (*Gopherus morafkai*) habitat (see AGFD 2014 report “Habitat Evaluation for Sonoran Desert Tortoise along the Proposed Right-of-Way for the Loop 202 South Mountain Freeway available at azdot.gov/southmountainfreeway). Mesquite, paloverde (*Parkinsonia* spp.), creosotebush, and saguaros are the predominant plant species. Although native habitat conditions have been altered in much of the developed neighborhood, the undisturbed parcels and proximity to undisturbed native habitat are likely to attract and provide habitat for the wide variety of wildlife found in the area, throughout the parcels.

The clearing or use of these parcels for project construction will be limited to previously disturbed areas to minimize the impacts on undisturbed desertscrub habitat. This will help maintain the amount of native wildlife habitat and resources in the area and minimize the displacement of wildlife. Demolition of buildings also has the potential to cause direct mortality to wildlife, including reptiles, small mammals, and migratory birds that may use the buildings for refuge, denning, and nesting habitat. Parcels that are disturbed by demolition or construction activities will be seeded with native species after use of those parcels, allowing regrowth of habitat. Since ADOT is likely to dispose these parcels after construction, the parcels would revert to current zoning for single-family residential development and wildlife habitat suitability in the future would be dependent on the density of development. Temporary impacts on wildlife in these parcels due to construction disturbance and noise are anticipated to be the same as for the overall project described in the FEIS/ROD due to the proximity to the ROW boundary.

If any Sonoran Desert tortoises are encountered during construction activities, the most current AGFD guidelines for handling Sonoran desert tortoises will be followed (see AGFD Web site

<azgfd.com/Wildlife/NonGameManagement/Tortoise>).

Area 6 – South Mountains vacant properties

Area 6 encompasses vacant parcels within the area of the South Mountains. There are seven total parcels in this area with remainder parcels outside of the Project ROW, totaling 58.2 acres (see additional details in Table 8 and Appendix A beginning on page A-80). Depending on the resolution of Maricopa County Case No. CV2015-011890, the remainder land north of the Project ROW within Parcels 7-11434, 7-11600, and 7-11443 is expected to be disposed to the City of Phoenix to be incorporated into the Phoenix South Mountain Park/Preserve. The remainder land north of the Project ROW from Parcels 7-11451, 7-11518, 7-11617, and 7-11926 will be disposed per ADOT policies and procedures. The land south of the Project ROW from Parcels 7-11443 and 7-11926, which is part of a utility easement, will remain in its current condition in ADOT's possession.

Table 8. South Mountains Vacant Properties

ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category ^a
7-11434	BBC Phoenix LLC	300-04-013E, 300-04-015X	NA ^b	Vacant	7.73	1
7-11443	Cach Holdings LLC	300-04-011A	NA	Vacant	11.41	1
7-11451	Mark Clounch dba Mark_L Assoc. Profit Sharing Plan	300-05-004F	14645 S. 4th Ave	Vacant	7.85	1
7-11518	Randolph Dean Gross & Beth Deborah Gross Revocable Living Trust	300-05-004D	14801 S. 27th Ave	Vacant	5.91	1
7-11600	Matmon LLC	300-04-011D, 300-04-013G, 300-04-015D, 300-04-015J, 300-04-015K	NA	Vacant	15.36	1
7-11617	National Christian Foundation Real Estate Inc	300-05-004E	14801 S 27th Ave	Vacant	7.36	1
7-11926	BBC Phoenix LLC	300-05-006B	NA	Vacant	2.56	1
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW ^b not applicable						

Additional details related to cultural resources and biological resources include:

CULTURAL RESOURCES

The parcels in Area 6 were surveyed or partially surveyed for cultural resources by CRMP. The results are reported in “*A Class III Cultural Resource Survey of Five Alternative Alignments in the South Mountain Freeway Corridor Study Area, Maricopa County, Arizona*” (Darling 2005). SHPO concurred with the adequacy of the report (Jacobs [SHPO] to Greenspan [ADOT], January 23, 2006).

All of the parcels that were previously only partially surveyed were surveyed by HDR in 2016. The results are reported in “*A Class III Cultural Resources Survey of 20 ADOT Parcels in Support of the 202L, South Mountain Freeway Project Environmental Impact Statement Reevaluation, Maricopa County, Arizona*” (Bartholomew and Brodbeck 2016). SHPO concurred with the adequacy of the report (Petty [FHWA] to Jacobs [SHPO] March 28, 2016, SHPO concurrence April 5, 2016).

BIOLOGICAL RESOURCES

The parcels are part of the South Mountains and lie near the South Mountain Park/Preserve. The parcels typically include rocky slopes, rock outcrops, small hills, and alluvial slopes with undisturbed Sonoran desert scrub vegetation that is characterized as medium quality Sonoran desert tortoise habitat in parcels 7-11434, 7-11443, and 7-11600 and low quality Sonoran desert tortoise habitat in the remainder parcels (see AGFD 2014 report “Habitat Evaluation for Sonoran Desert Tortoise along the Proposed Right-of-Way for the Loop 202 South Mountain Freeway available at azdot.gov/southmountainfreeway). Common chuckwalla (*Sauromalus ater*) habitat is located within the rocky outcrops within most of the parcels. Washes cross through some of the parcels.

The remainder parcels in this area will not undergo any demolition or construction activities as part of the Project. The disposal of parcels to the City of Phoenix for incorporating into South Mountain Park/Preserve will provide some additional long-term protection for wildlife and habitat in an area undergoing development, particularly for wildlife movement at Crossing 2 (see Figure 4) where the parcels are located; however, it is uncertain what the disposition of approximately 60 acres of private property immediately opposite of Crossing 2 will be. The disposal of the other parcels could result in habitat loss, increased habitat fragmentation, and human-related disturbance to wildlife depending on the future use of the land. The use of the parcels that are part of the utility corridor will remain the same with no additional effects on wildlife that may use or cross the parcels beyond those identified in the FEIS/ROD.

Area 7 – West Pecos Road residential properties

Area 7 encompasses residential parcels located at the far west end of Pecos Road. There are nine total parcels in this area with remainder parcels outside of the Project ROW, totaling 1.0 acres

(see additional details in Table 9 and Appendix A beginning on page A-88). One of the parcels (7-11911) has an existing single family residence that will be demolished. All of the other parcels are vacant. The remainder parcels will most likely be disposed after construction.

Table 9. West Pecos Road Residential Properties						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-10535	ADOT	300-05-678	17002 S 31st Ln	Vacant	0.05	1
7-10537	ADOT	300-05-705	3209 W Redwood Ln	Vacant	0.01	1
7-10539	ADOT	300-05-704	3205 W Redwood Ln	Vacant	0.03	1
7-11453	John and Sharon Cochran	300-05-664	3053 W Redwood Lane	Vacant	0.23	1
7-11528	David & Carmen Hernandez	300-05-663	3049 W Redwood Lane	Vacant	0.34	1
7-11644	Glen Zilly	300-05-668	3040 W Cedarwood Lane	Vacant	0.22	1
7-11732	Paul & Shelley Wiest	300-05-662	3045 W Redwood Lane	Vacant	0.41	1
7-11911	Boyd & Brianna Johnson	300-05-617	17013 S 27th Ave	SFR ^b	0.13	3
7-11912	John and Sharon Cochran	300-05-697	16913 S. 32nd Lane	Vacant	0.30	1
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW ^b single family residence						

Additional details related to cultural resources and biological resources include:

CULTURAL RESOURCES

Parcel 7-11911 is a completely developed residential development with no native ground surface remaining; as such, the parcel was not surveyed for cultural resources. The other parcels were surveyed for cultural resources by CRMP. The results are reported in “*A Class III Cultural Resource Survey of Five Alternative Alignments in the South Mountain Freeway Corridor Study Area, Maricopa County, Arizona*” (Darling 2005). SHPO concurred with the adequacy of the report (Jacobs [SHPO] to Greenspan [ADOT], January 23, 2006).

BIOLOGICAL RESOURCES

Parcel 7-11911 is a single family residence within a medium-density suburban neighborhood.

The other parcels are undeveloped lots within a low-density residential development with Sonoran desertscrub vegetation that has degraded as a result of the development's construction activities. The undeveloped parcels are within a walled and gated community that also has walled constructed residences that may hinder use and movement by many species of wildlife except birds and reptiles; however the parcels do provide some habitat for wildlife species found in the area.

Demolition of the single-family residence on Parcel 7-11911 is not expected to affect wildlife as there are no trees and very little vegetation growing on the property. Use of the undeveloped parcels is not anticipated and there would be no impacts on wildlife or habitat. Temporary impacts on wildlife in these parcels due to construction disturbance and noise are anticipated to be the same as for the overall project described in the FEIS/ROD due to the proximity to the ROW boundary.

Since disposal of the parcels is anticipated after project construction, the parcels would remain zoned for single-family residential development and future wildlife habitat suitability would depend on the plans of the future owner.

Area 8 – Mountain Park Church utility corridor property

Area 8 encompasses the utility corridor south of Pecos Road that is part of the Mountain Park Church parcel. The area includes 1.1 acres (see additional details in Table 10 and Appendix A beginning on page A-98). The property is a narrow strip of disturbed land that includes an overhead high voltage transmission line corridor. There is no plan to perform any demolition or construction within this land. Because of the utility corridor, this parcel has no economical value and will remain in its current state. Unless the utility owner decides to acquire the parcel from ADOT, it will remain in ADOT ownership after construction.

Table 10. Mountain Park Church Utility Corridor Property						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-11184	Mountain Park Church	301-70-009N, 301-70-009P	2408 E Pecos Rd	Church	1.13	2
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW						

Additional details related to cultural resources and biological resources include:

CULTURAL RESOURCES

The property was previously surveyed for cultural resources by CRMP. The results are reported in “*A Class III Cultural Resource Survey of Five Alternative Alignments in the South Mountain Freeway Corridor Study Area, Maricopa County, Arizona*” (Darling 2005). SHPO concurred with the adequacy of the report (Jacobs [SHPO] to Greenspan [ADOT], January 23, 2006).

BIOLOGICAL RESOURCES

The property is part of a suburban, developed housing subdivision; the remainder parcel is located immediately adjacent to Pecos Road and includes an overhead transmission line and access road. Vegetation consists primarily of desert broom that collects along a depression along the roadway shoulder. The parcel provides habitat for reptiles and some birds but generally has limited value for wildlife.

Area 9 – Lakewood residences outside Project ROW

Area 9 encompasses an area of the Lakewood neighborhood north of the freeway between 28th Street and 40th Street. The area includes 1.36 acres (see additional details in Table 11 and Appendix A beginning on page A-100). Within this area, there are eight single family residences that were acquired prior to the ROD due to hardships. These parcels were located within the Project ROW at one time during the NEPA process; however, they are no longer within the ROW footprint cleared in the ROD. ADOT has been renting these parcels since they acquired them and will dispose them in the future.

Table 11. Lakewood Residences Outside Project ROW						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
7-10465	ADOT	301-79-466	3429 E Cedarwood Ln	SFR ^b	0.18	4
7-10466	ADOT	301-70-121	2901 E Redwood Ln	SFR	0.13	4
7-10531	ADOT	301-79-461	3401 E Cedarwood Ln	SFR	0.18	4
7-10796	ADOT	301-70-115	2925 E Redwood Ln	SFR	0.24	4
7-10805	ADOT	301-70-119	2909 E Redwood Ln	SFR	0.14	4
7-10806	ADOT	301-70-746	3123 E Redwood Ct	SFR	0.17	4
7-10891	ADOT	301-79-455	3247 E Cedarwood Ln	SFR	0.18	4
7-10984	ADOT	301-70-750	3037 E Redwood Ln	SFR	0.14	4

Table 11. Lakewood Residences Outside Project ROW						
ADOT Parcel No.	Owner's Name	Assessor Parcel Number	Site Address	Property Type	Remnant Parcel Area (acres)	Parcel Category^a
Notes: ^a Parcel categories are defined as: 1) Parcels that are entirely vacant and the remainder parcel is also vacant; 2) Parcels that have built improvements within the Project ROW and the remainder parcel is vacant; 3) Parcels that have built improvements within the Project ROW and the remainder parcel; 4) Parcels that were acquired as hardship or protective acquisitions that are now entirely outside of the Project ROW ^b single family residence;						

Additional details related to cultural resources and biological resources include:

CULTURAL RESOURCES

The parcels are completely disturbed by residential development and no native ground surface remains; as such, they were not surveyed for cultural resources.

BIOLOGICAL RESOURCES

The parcels are single family residences within a suburban neighborhood and have limited value for wildlife other than landscape vegetation that can provide habitat for migratory birds. Since the parcels will be maintained and sold, there will be no new impacts on wildlife.

Summary of commitments related to Remainder Parcels

This section summarizes the commitments made in the Geographic Area Analysis related to prohibiting construction activities within certain remainder parcels. The commitments listed below will be implemented and tracked along with the commitments and mitigations measures presented in the ROD and incorporated as necessary into the contractual technical provisions for the Project.

- ▶ Area 3 - Due to the location of Parcel 7-11716 along and within the Salt River, the parcel will not be developed and will be allowed to grow vegetation naturally or eventually be incorporated into the Rio Salado Oeste habitat restoration project.
- ▶ Area 5A - No demolition or construction will occur within these remainder parcels, which are a narrow strip of partially disturbed land that includes an overhead high voltage transmission line and underground water line corridor.
- ▶ Area 5B - The clearing or use of these parcels for Project construction will be limited to previously disturbed areas to minimize the impacts on undisturbed desertscrub habitat.
- ▶ Area 6 – No demolition or construction will occur within the remainder parcels that are a narrow strip of partially disturbed land that includes an overhead high voltage transmission line and underground water line corridor. The other remainder parcels in this area will not

undergo any demolition or construction activities as part of the Project and will be disposed in accordance with ADOT policy and procedures.

4. Public/Agency Outreach

Land acquisition and relocation assistance services for the project are available to all individuals in accordance with the Uniform Act, as amended. The implementing regulation for the Uniform Act on federally funded highway projects is 49 C.F.R. Part 24. The Uniform Act's objectives are to:

- ▶ provide uniform, fair, and equitable treatment of people whose property is acquired or who are displaced as a result of a federally funded project
- ▶ ensure relocation assistance is provided to displaced people to lessen the financial impact of being displaced
- ▶ ensure decent, safe, and sanitary housing will be made available to displacees within the person's financial means.
- ▶ encourage and expedite acquisition by agreement and without coercion

As part of the Uniform Act, ADOT and its consultants and contractors must prevent discrimination in all highway programs and must ensure compliance with Title VI of the Civil Rights Act of 1964, as amended (42 United States Code § 2000d, et seq.). Accordingly, no person can be excluded from participation in, denied the benefits of, or in any other way be subjected to discrimination under any federally funded program or activity because of his or her race, color, or national origin. For this project, all eligible displaced people will receive the same opportunities with regard to services, benefits, and financial aid. To ensure participation, informational meetings will be scheduled in convenient, accessible locations and at various times.

ADOT and FHWA consistently apply the required acquisition and relocation assistance program (Uniform Act) afforded to affected residents and businesses.

5. Conclusion and Recommendation

Since the ROD was signed, the project development process has continued with preliminary engineering, utility locating and coordination, geotechnical investigations, property acquisition, residential and business relocations, and demolition of parcels needed for the project. On February 26, 2016, ADOT entered into a contract with Connect 202 Partners, LLC, to design, build, and maintain the freeway for a 30-year term. Construction will not begin until after July 13, 2016.

Since approval of the ROD, the following changes in laws or regulations that would affect the analysis of protected resources occurred:

- ▶ The US Fish and Wildlife Service determined that the Sonoran desert tortoise does not warrant endangered species protection and was removed from the Endangered Species Act candidate list; ADOT signed a Candidate Conservation Agreement for the Sonoran desert tortoise as a participating agency

The Selected Alternative with the proposed additional scope items analyzed in the previous section still meets the purpose and need for the proposed action from the FEIS and ROD. No changes to the purpose and need for the project are proposed.

Conclusion

A Supplemental FEIS is not warranted for the following reasons:

- ▶ The proposed modifications are limited in scope and impacts and are all within or adjacent to the ROW footprint analyzed in the FEIS/ROD.
- ▶ The Selected Alternative and its related impacts identified in the FEIS and ROD would not significantly change as a result of the modifications described herein.

Recommendation

FHWA, in coordination with ADOT, reevaluated the South Mountain Freeway, I-10 (Papago Freeway) to I-10 (Maricopa Freeway) FEIS and ROD per 23 C.F.R. § 771.129. FHWA, with concurrence from ADOT, has determined that no substantial changes have occurred in the social, economic, or environmental impacts of the proposed action that would substantially impact the quality of the human, socioeconomic, or natural environment. Therefore, the original environmental document remains valid for the proposed action. It is recommended that the project identified herein be advanced to the next phase of project development.

LOOP 202
South Mountain
Freeway

South Mountain Freeway FEIS/ROD Reevaluation #5

in Maricopa County, Arizona



Federal Highway Administration

ADOT

Arizona Department of Transportation

June 1, 2017

Federal-aid Project Number: NH-202-D(ADY)

ADOT Project Number: 202L MA 054 H8827 01C

Record of Decision

June 1, 2017

The Federal Highway Administration (FHWA), in coordination with the Arizona Department of Transportation (ADOT), reevaluated the South Mountain Freeway, Interstate 10 (I-10, Papago Freeway) to I-10 (Maricopa Freeway) Final Environmental Impact Statement and Record of Decision per 23 Code of Federal Regulations § 771.29 to address the clearance of 47 parcels of new easement and/or right-of-way to be added to the project since the approval of the ROD on March 5, 2015.

FHWA, with concurrence from ADOT, has determined that no substantial changes have occurred in social, economic, or environmental impacts of the proposed action that would substantially impact the quality of the human, socioeconomic, or natural environmental. Therefore, the original environmental document remains valid for the proposed action.

Robert Samour

Robert Samour, PE
Senior Deputy State Engineer
Arizona Department of Transportation

6/2/17

Date

Karla S. Petty

Karla S. Petty
Arizona Division Administrator
Federal Highway Administration

6/5/2017

Date

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Table of Contents

List of Acronyms and Abbreviations.....	iv
1.0 Introduction and Project Description.....	1
1.1 Project Location.....	1
1.2 Approved Environmental Documentation	1
1.3 Previously Identified Impacts	3
1.4 Public and Agency Involvement	4
2.0 Description of Project Change.....	6
3.0 Environmental Consequences.....	18
3.1 Land Use	19
3.2 Displacements and Relocations.....	19
3.3 Water Resources	19
3.4 Waters of the United States	19
3.5 Topography, Geology, Soils	20
3.6 Biological Resources	20
3.7 Cultural Resources.....	21
3.8 Prime and Unique Farmland.....	21
3.9 Hazardous Materials.....	22
3.10 Visual Resources	22
3.11 Temporary Construction Impacts.....	22
3.12 Material Sources and Waste Material.....	22
4.0 New commitments related to New Parcel Acquisitions.....	22
5.0 Public/Agency Outreach.....	23
6.0 Conclusion and Recommendation.....	23
6.1 Conclusion	23
6.2 Recommendations.....	23

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Figures

Overview Figure.....	2
Figure 1. Detail Map	10
Figure 2. Detail Map	11
Figure 3. Detail Map	12
Figure 4. Detail Map	13
Figure 5. Detail Map	14
Figure 6. Detail Map	15
Figure 7. Detail Map	16
Figure 8. Detail Map	17

Tables

Table 1. New Parcel Summary.....	9
Table 2. Environmental Consequences Assessment, Acquisition of New Parcels	18

Appendix-A Parcel Maps

Appendix-B Section 106 Consultation Summary

Appendix-C NRCS Exempt Letter

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

List of Acronyms and Abbreviations

ADOT	Arizona Department of Transportation
BIA	Bureau of Indian Affairs
CAT	Citizens Advisory Team
CFR	Code of Federal Regulations
DEIS	Draft Environmental Impact Statement
EPA	Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
HOV	high occupancy vehicle
I-10	Interstate 10
N/A	Not Applicable
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
ROD	Record of Decision
ROW	right-of-way
SMF	South Mountain Freeway
TI	Traffic Interchange
UA	Uniform Act
USACE	U.S Army Corps of Engineers
USFWS	U.S Fish and Wildlife Service
Western	Western Area Power Administration

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

1.0 Introduction and Project Description

The Federal Highway Administration (FHWA), in coordination with the Arizona Department of Transportation (ADOT), conducted a reevaluation of the South Mountain Freeway (SMF), Interstate 10 (I-10, Papago Freeway) to I-10 (Maricopa Freeway) Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) per 23 Code of Federal Regulations (CFR) § 771.129 to address the identification of 47 parcels where new easement and/or right-of-way (ROW) is required since the approval of the ROD on March 5, 2015. All 47 parcels are located outside of the ROW footprint analyzed in the FEIS/ROD (Overview Figure). Parcels that are being acquired as ROW are fee title and will become State-owned lands permanently incorporated into the State Highway System. The easements are divided into two basic categories, temporary construction and perpetual drainage. In both cases the underlying ownership will remain unchanged. Temporary construction easements (TCEs) will grant ADOT rights to occupy the land during construction but will expire when the project is finished and the unencumbered fee interest in the land will revert back to the owner. For perpetual drainage easements, ADOT will have the rights to construct drainage conveyances and will also have rights to access and maintain those conveyances after the project is completed. Instances of parcels being used for construction under a State Board Resolution are the same as TCEs but the owner is not financially compensated for use of the easement, typically because the owner is a municipal entity.

Acquisitions are being completed in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended. This reevaluation document provides an overview of the freeway project, describes the new actions requiring the expansion of rights-of-ways and easements, assesses the environmental consequences of the expansion of rights-of-ways and easements, describes past and future public and agency outreach, and presents a conclusion related to the inclusion of the new ROW and easement parcels in the freeway project.

1.1 Project Location

ADOT is the sponsor of the construction and operation of the South Mountain Freeway. The freeway will constitute a section of the Regional Freeway and Highway System, the Loop 202 (also referred to as State Route 202L). The project is in the southwestern portion of the Phoenix metropolitan area in Maricopa County, Arizona (refer to Overview Figure). The approximately 22-mile-long freeway will be constructed as an eight-lane divided, access-controlled facility, with four travel lanes in each direction. Three lanes will be for general purpose use and one lane will be dedicated to high-occupancy vehicle use.

1.2 Approved Environmental Documentation

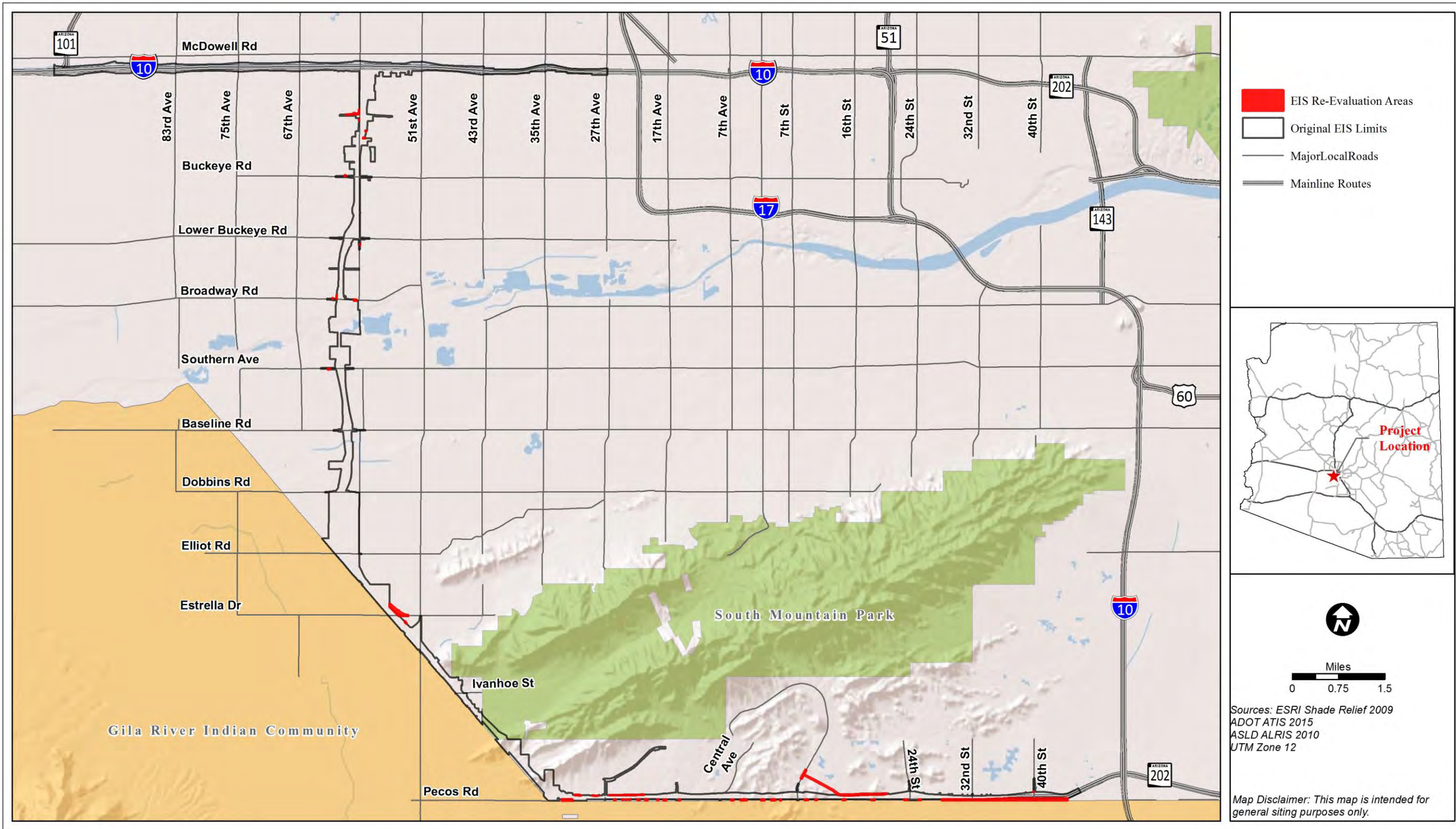
The approved environmental documentation completed by ADOT, the project sponsor, and FHWA, the lead federal agency, included:

- Draft Environmental Impact Statement (DEIS) signed on April 16, 2013, and released to the public on April 26, 2013.
- FEIS signed on September 18, 2014, and released to the public on September 26, 2014.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Overview Figure



SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

- Errata to the FEIS signed on November 19, 2014 and released to the public on November 28, 2014 (the Errata was published to address public comments on the DEIS that were inadvertently omitted from the FEIS).
- ROD signed on March 5, 2015, and released to the public on March 13, 2015.
- South Mountain Freeway FEIS/ROD Reevaluation (#1) signed February 19, 2016 addressed the addition of a local street connector and a pedestrian bridge.
- South Mountain Freeway FEIS/ROD Reevaluation (#2) signed June 20, 2016 addressed the addition of remainder parcels to the Project ROW.
- South Mountain Freeway FEIS/ROD Reevaluation (#3) signed August 10, 2016 addresses the addition of Chandler Boulevard: 27th Avenue to 19th Avenue.
- South Mountain Freeway FEIS/ROD Letter-to-file (#1) signed August 18, 2016 addresses the addition of high occupancy vehicle (HOV) median widening at the I-10 Maricopa Traffic Interchange (TI).
- South Mountain Freeway FEIS/ROD Reevaluation (#4) signed April 4, 2017, is for changing partial-parcel acquisitions to entire-parcel acquisitions between Vineyard Road and Lower Buckeye Road.

1.3 Previously Identified Impacts

The FEIS and ROD present a detailed description of anticipated impacts related to the Selected Alternative. Key elements are listed below. This reevaluation will cover impacts beyond those previously disclosed.

- The project will convert approximately 1,813 acres of land to a transportation use.
- The project will acquire approximately 508 acres of land as remainder parcels that will eventually be sold or disposed after construction.
- The project is consistent with local and regional plans; however, it will introduce visual and noise intrusion adjacent to residential neighborhoods.
- Implementation of the project in the Western Section will result in adverse impacts on populations protected under Title VI and the environmental justice Executive Order; impacts will not, however, be disproportionately high or cause undue hardship when compared with such impacts on the general population.
- The project will result in the displacement of approximately 169 single-family homes, two apartment complexes with 680 total units, and 42 businesses.
- The City of Phoenix will experience an inconsequential reduction of annual property and sales tax revenue due to the conversion of land to a transportation use. Travel time savings for motorists in the region after completion of the project will be over \$200 million per year (in 2013 dollars).
- The project will not result in any exceedances of the health-based National Ambient Air Quality Standards.
- The project will require the placement of noise barriers in selected locations to reduce noise to levels that meet ADOT policy and FHWA regulations.
- The project will affect up to 122 water wells and 94 acres of floodplains.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

- The project will impact Waters of the United States and require appropriate permitting approvals from the U.S. Army Corps of Engineers (USACE).
- The project will not affect any currently listed threatened and endangered species. However, the project will result in the conversion of cover, nesting areas, and food resources for wildlife provided by the natural plant communities found in the Study Area. The project will create a physical barrier that could, depending on design, decrease movement of wildlife to and from the South Mountains and Sierra Estrella. In response, multifunctional crossing locations have been identified to provide habitat connectivity under the freeway.
- The project will affect a number of National Register of Historic Places (NRHP)-eligible prehistoric and historic sites and the South Mountains Traditional Cultural Property.
- The project will convert 723 acres of prime and unique farmlands to a transportation use.
- The project will indirectly convert 177 acres of prime and unique farmlands to uses other than agriculture.
- The project will interact with five high-priority hazardous materials sites.
- Impacts on views from residential and rural uses include construction impacts, new traffic interchanges, and visibility of the new facility. Impacts will not change the low-to-moderate visual quality of views along the freeway.
- The project will provide benefits related to regional energy consumption.
- The project will result in the direct use of resources in the South Mountains afforded protection by Section 4(f) of the Department of Transportation Act of 1966. There is no feasible and prudent alternative that avoids use of the South Mountains.

1.4 Public and Agency Involvement

ADOT and FHWA undertook an extensive public and agency involvement program during the National Environmental Policy Act (NEPA) phase of the project. Key elements included:

- Publication of the Notice of Intent on April 20, 2001, in the Federal Register (66[77]:20345).
- Invitations sent in 2001 to USACE, U.S. Environmental Protection Agency (EPA), U.S. Bureau of Indian Affairs (BIA), and U.S. Fish and Wildlife Service (USFWS) to be cooperating agencies were issued. USACE and BIA agreed to be federal cooperating agencies. EPA and USFWS declined. In 2009, the Western Area Power Administration (Western) was invited, and agreed, to be a cooperating agency.
- Agency scoping letters were sent to 232 federal, State, and local agencies in October 2001. A 2-day agency scoping meeting was held later that month in Phoenix. Agencies were invited to participate in the project through monthly progress meetings during the project duration.
- Public scoping was initiated in November 2001 and included presentations at 23 neighborhood meetings and two public meetings.
- Between the public scoping kick-off through the release of the DEIS, over 200 presentations were made to neighborhood groups, homeowners' associations, chambers of commerce, village planning committees, trade associations, and other interested parties. Twelve public meetings were held.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

- ADOT created a Citizens Advisory Team (CAT) made up of groups and organizations in the Study Area. The CAT worked as a voluntary, advisory team to provide advice and input to ADOT and FHWA. Approximately 60 CAT meetings were held, each open to the public.
- The DEIS was released to the public on April 26, 2013, beginning the 90-day comment period (the minimum requirement under NEPA is 45 days). A public hearing was held May 21, 2013, at the Phoenix Convention Center from 10 a.m. to 8 p.m. Six community forums were held in Study Area communities to supplement the public hearing. Additionally, an online public hearing was created for those who could not attend a meeting in person.
- Approximately 900 people attended one of the public events, almost 1,900 unique visitors viewed information from the online hearing, and the project team received over 8,000 comments.
- The FEIS was released to the public on September 26, 2014. A 60-day review period was provided. As a result of the publication of the errata, ADOT and FHWA extended the review period to December 29, 2014. During the review period for the FEIS and errata, approximately 250 comments were received.
- ADOT and FHWA worked in close coordination with the Gila River Indian Community to hold a community forum on November 15, 2014, at the Boys & Girls Club, Gila River – Komatke. The Gila River Indian Community developed the agenda and facilitated the forum, which consisted of introductions, a description of the comment opportunities and court reporters' roles, an introduction to the South Mountain Freeway video flyover simulation, and an "open-microphone" comment period. Other than invited guests, the meeting was open to only Gila River Indian Community members. FHWA and ADOT project team members were guests at the forum and were in attendance to listen to comments. A translator was provided for those wishing to speak in the native O'odham language.
- An open house meeting on June 15, 2016, at Pecos Community Center, 17010 S. 48th St., Phoenix, was sponsored by State Representative Jill Norgaard in collaboration with State Representative Bob Robson, State Senator Jeff Dial, and City of Phoenix Councilman Sal DiCiccio. The purpose of the meeting was to provide a briefing on noise-abatement plans, traffic management and scheduling, bike paths, and aesthetics.
- A public open house meeting was held on August 24, 2016, at the Kings Ridge Preparatory Academy Cafeteria, 3650 S 64th Lane, Phoenix, to discuss the location and aesthetic treatment of the planned pedestrian bridge located between Broadway and Lower Buckeye Roads. Thirteen people attended the presentation and participated in a question and answer session.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

- Three public meetings were held in 2016 to provide details and seek input on preliminary design plans, including information on the freeway's location, profile, interchange configurations and noise barrier locations, as well as initial concepts for landscaping and visual appearance:
 - September 27, 2016, at the Desert Vista High School, Multipurpose Room, 16440 S. 32nd St., Phoenix
 - September 28, 2016, at the Betty Fairfax High School, Multipurpose Room, 8225 S. 59th Ave., Laveen
 - October 6, 2016, at the Fowler Elementary School, Multipurpose Room, 6707 W. Van Buren St., Phoenix

Approximately 800 people participated in these meetings and the more than 660 comments, questions, emails and phone calls were collected by the Project team.

- A meeting for leaders from cities, regional agencies, schools, Title VI organizations, large employers, associations, and community public information officers was held December 20, 2016, at 411 N Roosevelt Ave, Chandler, to provide a 6-month construction look ahead for the period between January 2017 and July 2017.
- Since September 2016 outreach has included the following metrics:
 - 764 stakeholders have been engaged through attending a public meeting or contacting the Project team.
 - 305 inquiries from members of the public have been received.
 - 135 public parties were contacted by the Project team to complete questionnaires and surveys.
 - 6 construction alerts have been issued for specific activities.
 - 1 Construction notice has been issued in both English and Spanish to provide a 6-month look ahead for the period between January 2017 and July 2017.
 - ADOT has issued media releases on average once per week since September 2016 to keep the public apprised of project updates.

2.0 Description of Project Change

New ROW and easements summarized in the table below are for stormwater drainage facilities, utility relocations, changes to grading and slopes, changes to the location of ramps at the planned Estrella Drive Traffic Interchange (TI), modifications to the local road system, modifications to driveways and access points, and slight variations from the preliminary ROW plans to the final ROW boundary (refer to Figures 1 through 8 following Table 1).

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Number; ADOT Parcel No.	Acre- age	Type	Purpose/ Notes		Number; ADOT Parcel No	Acre- age	Type	Purpose/ Notes
2 Not applicable (N/A)	9.67	Incorporating land owned by ADOT into the highway system as perpetual drainage easement ^b	Construct and maintain stormwater detention facility		3 7-11915	0.03	Temporary construction easement ^c	Modify driveway entrance
4 7-11561	14.23	Perpetual drainage easement ^b	Construct and maintain stormwater detention facility		5 7-11561	3.72	Perpetual drainage easement ^b	Construct and maintain stormwater detention facility
8 7-11469	0.23	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		9 7-11504	0.34	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
10 7-11504	0.26	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		11 7-11504	0.43	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
12 7-11504	0.26	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		13 7-11504	0.28	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
14 7-11504	0.17	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		15 7-11504	0.68	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
16 7-11504	0.28	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		17 7-11504	0.09	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
18 7-11504	0.72	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		19 7-11504	0.15	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
20 7-11504	0.17	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		21 7-11504	0.13	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
22 7-11421	0.13	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		23 7-11421	0.08	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
24 7-11421	0.34	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		25 7-11421	0.10	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
26 7-11421	0.02	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		27 7-11421	0.11	Perpetual drainage easement ^b	Construct and maintain stormwater facilities

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Number; ADOT Parcel No.	Acre- age	Type	Purpose/ Notes		Number; ADOT Parcel No	Acre- age	Type	Purpose/ Notes
28 7-11421	0.11	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		29 7-11421	0.14	Perpetual drainage easement ^b	Construct and maintain stormwater facilities
30 7-11421	0.17	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		32 7-11421	0.77	Fee ROW ^d	Not covered in FEIS. Resolve discrepancy between preliminary and final ROW boundary
33 7-11784	0.07	Fee ROW ^d	Construct and maintain stormwater facilities		34 7-11506	0.28	Fee ROW ^d	Not covered in FEIS. Resolve discrepancy between preliminary and final ROW boundary
35 7-11445	2.16	Perpetual drainage easement ^b	Construct and maintain stormwater facilities		37a 7-11547	9.64	Fee ROW ^d	Reconfigure ramps and crossroad at Estrella Drive Traffic Interchange
37b 7-11576	0.09	Fee ROW ^d	Reconfigure ramps and crossroad at Estrella Drive Traffic Interchange		38 7-11461	0.06	Temporary construction easement ^c	Modify driveway entrance
39 7-11657	0.01	Fee ROW ^d	Modify local road system		40 7-11657	0.05	Fee ROW ^d	Resolve discrepancy between preliminary and final ROW boundary
41 7-11657	0.001	Fee ROW ^d	Match slope to surrounding terrain		42 7-11657	0.02	Fee ROW ^d	Match slope to surrounding terrain
43 7-11940	0.01	Fee ROW ^d	Resolve discrepancy between preliminary and final ROW boundary		44 7-11607	0.15	Temporary construction easement ^c	Modify driveway entrance
45 7-11500	0.21	Fee ROW ^d	Cul-de-sac		46 7-11541	0.08	Temporary construction easement ^c	Modify driveway

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Number; ADOT Parcel No.	Acre- age	Type	Purpose/ Notes		Number; ADOT Parcel No	Acre- age	Type	Purpose/ Notes
47 7-11525	0.67	Temporary Construction Easement and Fee ROW ^d	Bus Bay and Street Widening		48 N/A	14.07	Temporary construction easement ^c	Relocate water main
50 City Street	0.59	State Board Resolution ^c	Modify local road system		52 City Street	0.02	State Board Resolution	Modify local road system
54 7-11547	0.24	State Board Resolution ^c	Modify local road system					
Total acres:						62.23		

Notes:

^aParcel numbers 1, 6, 7, 31, 36, 49, 51 and 53 have been omitted from Reevaluation #5 due to administrative reasons, and will be included in separate and subsequent reevaluations if needed. The numbering of the parcels has been left as-is to maintain consistency with the previously submitted cultural resources survey report for Reevaluation #5.

^bPermanent easement allowing disturbance for both construction and perpetual maintenance.

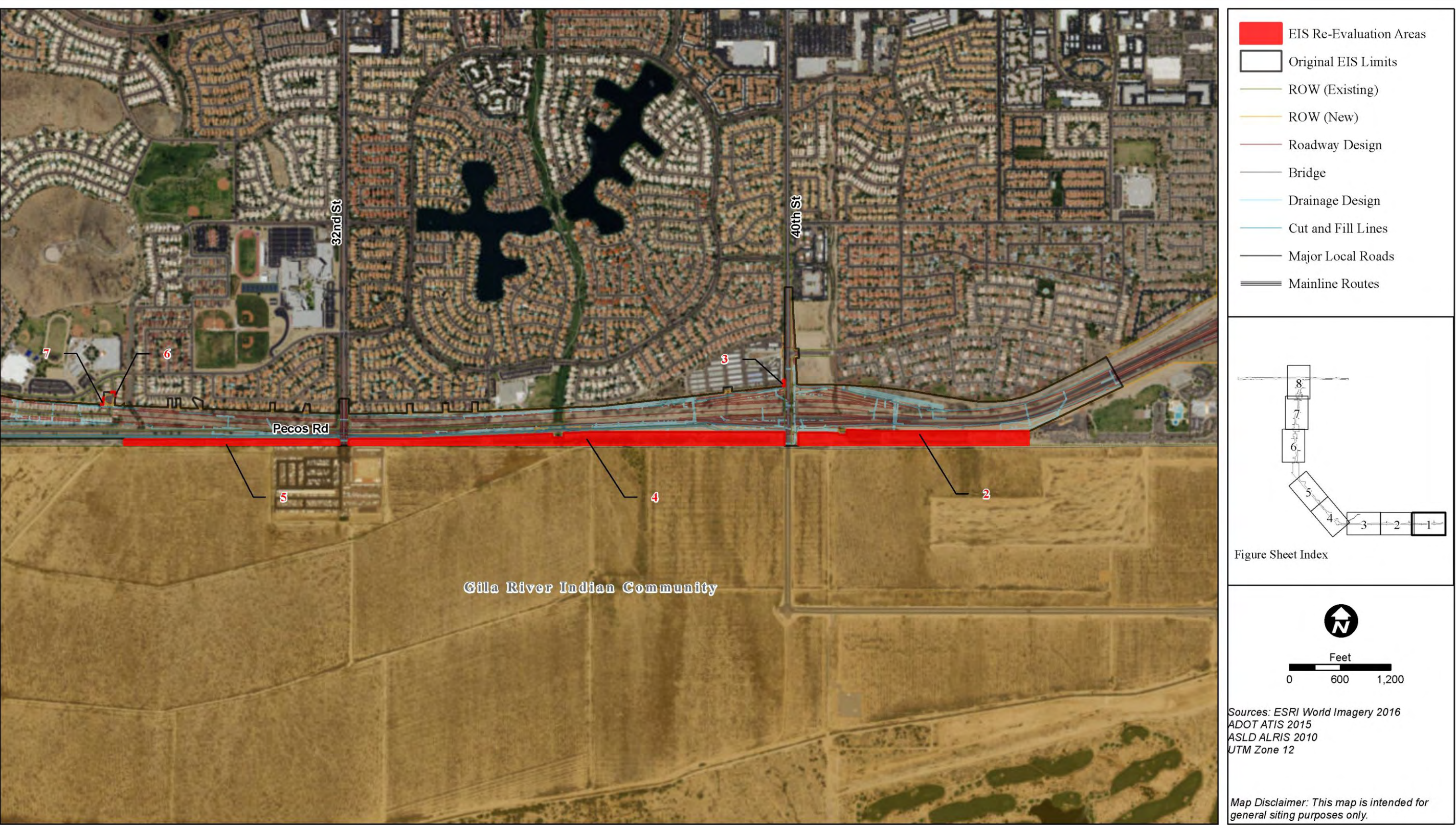
^cTemporary easement for use during construction period only.

^dPermanent ROW allowing disturbance for both construction and perpetual maintenance.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Figure 1. Detail Map



FEIS/ROD Reevaluation #5 – Rev 2

Figure 2. Detail Map



SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Figure 3. Detail Map



SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Figure 4. Detail Map

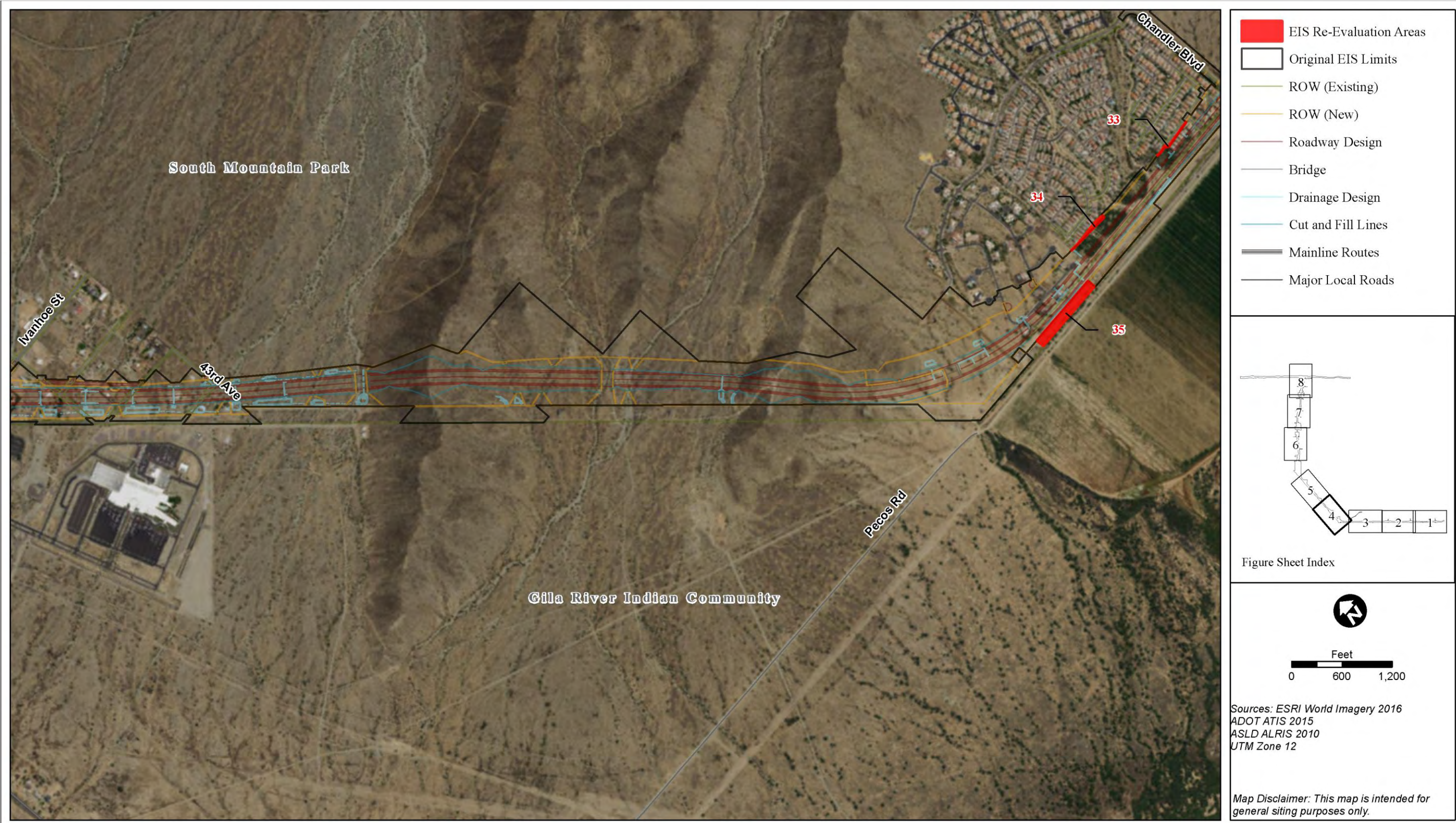


Figure 5. Detail Map

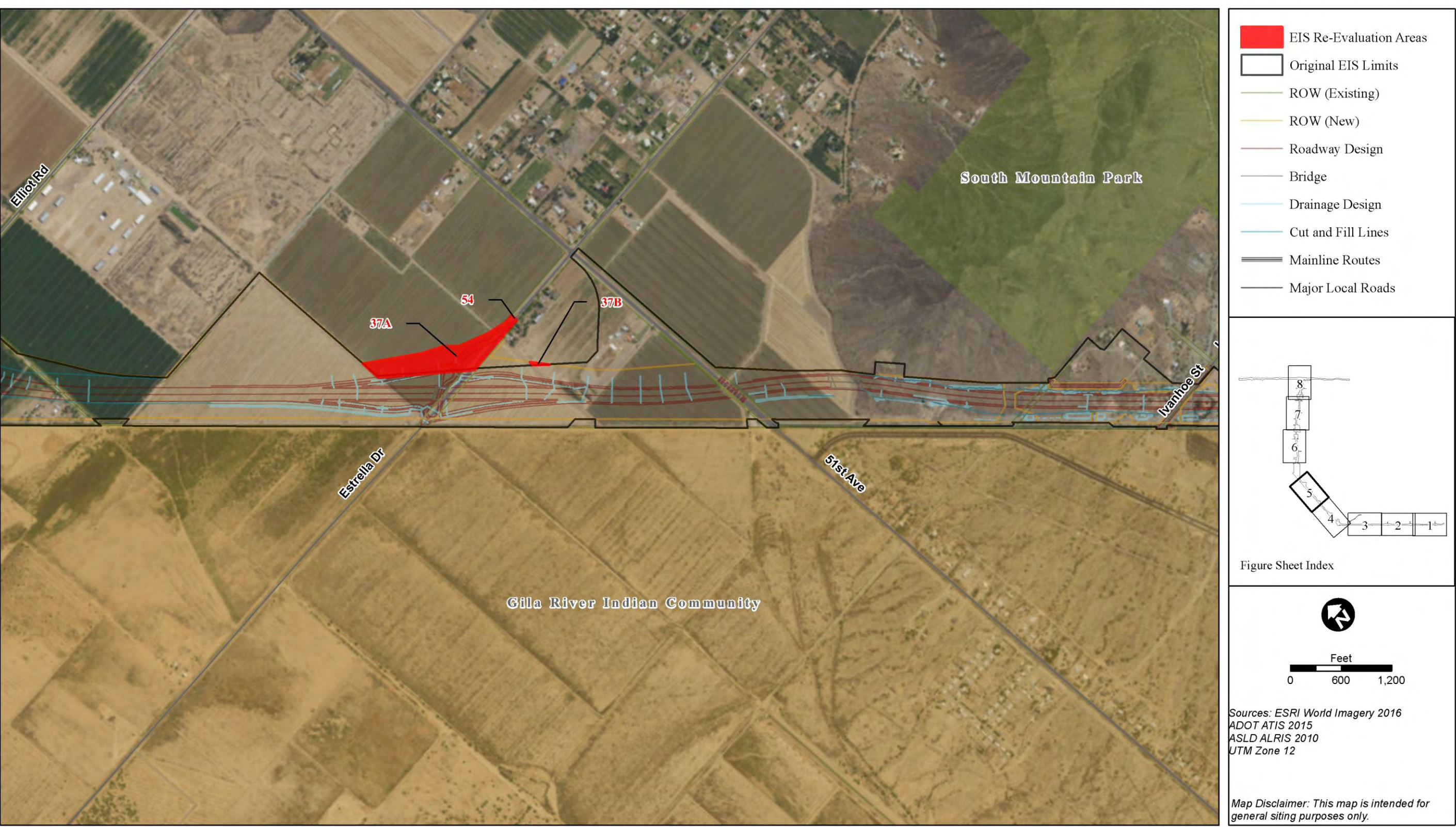
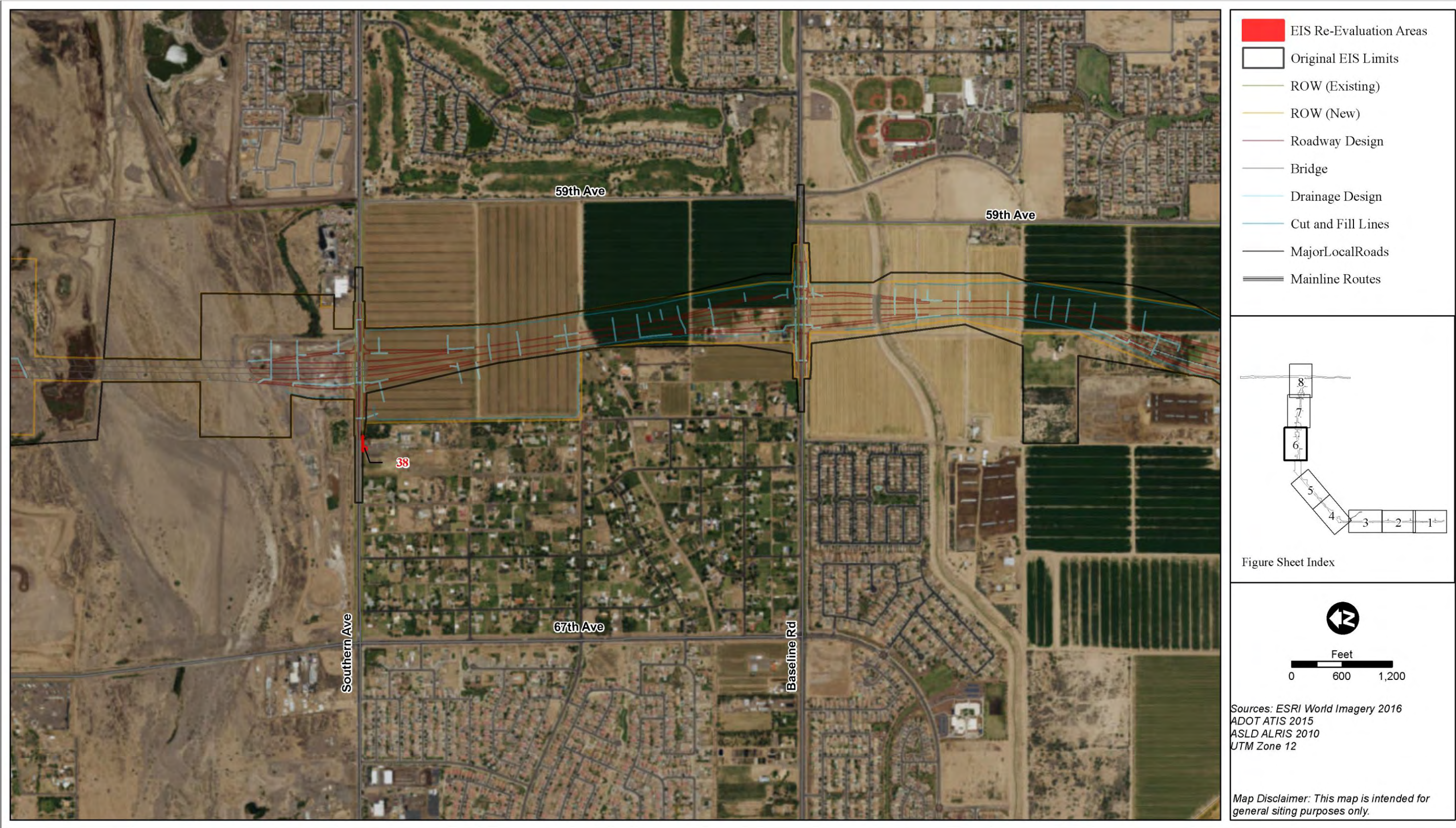


Figure 6. Detail Map



SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

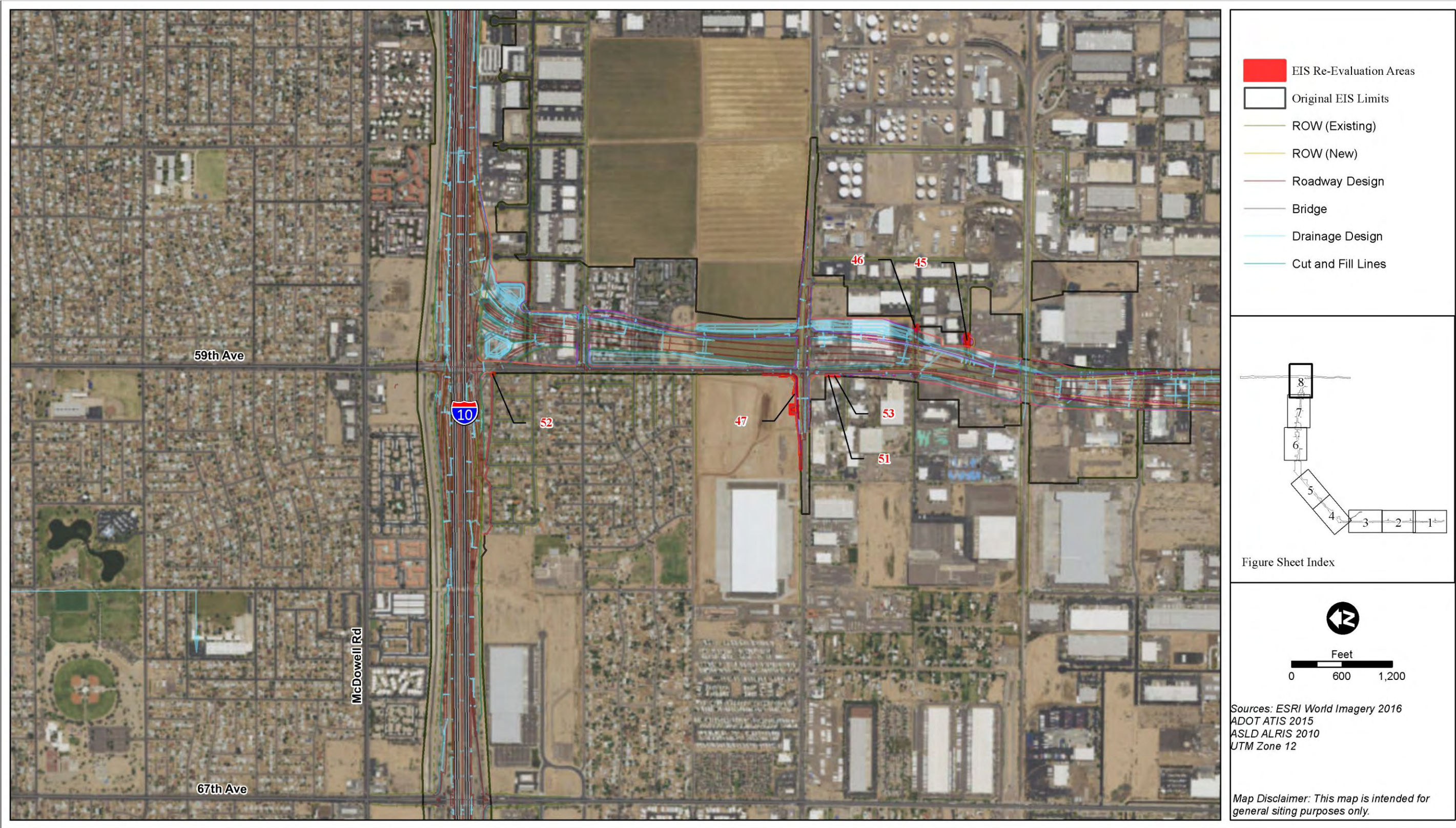
Figure 7. Detail Map



SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Figure 8. Detail Map



SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

3.0 Environmental Consequences

This section presents an analysis of the environmental consequences at a corridor-wide level (Table 2) and then provides additional details for changes to the project occurring in new ROW and/or easements. All of the mitigation and commitments made in the FEIS and ROD for the project apply to the new parcels presented in this reevaluation. Resources with changes in environmental impacts are described in more detail following the table.

Table 2. Environmental Consequences Assessment, Acquisition of New Parcels					
Setting/Resource Circumstance	Change in Affected Environment		Change in Environmental Impact		Additional Discussion Included
	Yes	No	Yes	No	
Land Use	X			X	See discussion below
Social Conditions		X		X	
Environmental Justice and Title VI		X		X	
Displacements and Relocations	X			X	See discussion below
Economics		X		X	
Air Quality		X		X	
Noise		X		X	
Water Resources	X			X	See discussion below
Floodplains		X		X	
Waters of the United States	X		X		See discussion below
Topography, Geology, Soils	X			X	See discussion below
Biological Resources	X		X		See discussion below
Cultural Resources	X			X	See discussion below
Prime and Unique Farmland	X		X		See discussion below
Hazardous Materials	X			X	See discussion below
Visual Resources	X			X	See discussion below
Energy		X		X	
Temporary Construction Impacts	X			X	See discussion below
Material Sources and Waste Material	X			X	See discussion below
Secondary and Cumulative Impacts		X		X	
Section 4(f)/6(f)		X		X	

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

3.1 Land Use

An additional 62.23 acres of land not originally disclosed in the FEIS/ROD will be converted to rights-of-ways or easements and will encompass the construction of elements related either directly or indirectly to the SMF project. This is a 3.4 percent increase over the 1,813 acres of land required for the project anticipated in the FEIS/ROD. All areas of previously unidentified rights-of-ways or easements are adjacent to the proposed freeway ROW identified in the FEIS/ROD. The current uses for the new parcels are undeveloped lands, existing public rights-of-ways occupied by city streets or sidewalks, and portions of private lands that have been developed as commercial, industrial, residential, or farmland. Compared to the FEIS/ROD, the amount of land being temporarily or permanently converted to transportation use from undeveloped land is increasing by 5.2 percent (an additional 36.89 acres over 712 acres), from residential is increasing by 0.1 percent (an additional 0.15 acres over 164 acres), from commercial/industrial is increasing by 0.1 percent (an additional 0.21 acres over 177 acres), and from farmland is increasing by 1.3 percent (an additional 9.74 acres over 723 acres). Easements totaling 15.24 acres are being acquired from existing streets and sidewalks will not result in a change in impacts because those areas are currently used for transportation. Changes in ROW and easement requirements are small increases that represent minor refinements based on final design; impacts to land uses have been adequately disclosed in the FEIS/ROD. No new mitigation measures are required for impacts on land use as a result of these project changes.

3.2 Displacements and Relocations

None of the rights-of-ways or easement acquisitions will result in additional displaced residents or businesses. The acquisitions from developed private properties are for the purposes of maintaining driveway access and for reconfiguring pedestrian facilities and access. These changes will not impact the buildings on the affected properties or otherwise result in conditions that make houses uninhabitable or business unviable. No new mitigation measures are required to address displacement or relocation impacts as a result of these project changes.

3.3 Water Resources

As listed in the above Table 1, many of the new rights-of-ways and easement parcels are required to construct and maintain stormwater conveyance and detention facilities. These facilities are being designed to comply with post-construction water quality requirements and best-management practices as described in the ADOT *Erosion and Pollution Control Manual*. Other than the intermittent conveyance of storm runoff and inundation during or immediately following storm events, none of the parcels encompass surface waters that could be potentially impacted. No new mitigation measures are required for impacts on water resources as a result of these project changes.

3.4 Waters of the United States

A preliminary jurisdictional delineation and individual permit application have been submitted to USACE for the project that includes the new ROW and easements that are the subject of this reevaluation. Impacts to Waters of the US are quantified in the individual permit application that account for the activities planned in these areas where Waters of the US are present. The change in impacts from those disclosed in the EIS/ROD are categorized as temporary but permanent impacts have not increased as a

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

result of project changes since the EIS/ROD. No work will occur within jurisdictional areas until all governmental approvals have been received to authorize the work. To prevent the contractor or third parties from entering jurisdictional areas before authorization has been received, rope barriers have been erected surrounding the jurisdictional areas to prevent entry. No new mitigation measures are required for impacts on Waters of the US as a result of these project changes.

3.5 Topography, Geology, Soils

New parcels being acquired for stormwater facilities will undergo excavation to construct channels and detention basins. As a result, changes in topography will occur. These changes to the topography are relatively minor and will represent a small portion of the project's overall impacts to topography. Because the purpose of these stormwater facilities is control discharge rates and provide sediment and erosion control, no additional or worsening of impacts to soils and topography offsite are anticipated. No new mitigation measures are required for impacts on topography, geology, or soils as a result of these project changes.

3.6 Biological Resources

Construction in the new parcels will impact habitats that are potentially suitable for federally protected, state-protected, and tribal-special-status species previously analyzed in the Biological Evaluation (July 2014) and the ROD. Of the new parcels, 15.25 acres (approximately 25 percent of the new parcel total) is land that is covered in hard surface (asphalt, concrete, or buildings) or compacted gravel. The developed areas do not represent potential habitat for wildlife or protected species, and no further action is needed to address potential impacts in those areas. The new parcels that encompass undeveloped desert or desert landscaping totaling 36.31 acres (approximately 59 percent of the new parcel total) or farmland including fallow farmland and uncultivated areas immediately adjacent to farmland totaling 10.23 acres (approximately 16 percent of the new parcel total) could potentially be occupied by wildlife and protected species. Compared to the overall project conversion of undeveloped lands to transportation uses disclosed in the FEIS/ROD totaling 712 acres, the new parcel acquisitions of undeveloped desert or desert landscaped areas will represent an increase of approximately 5.1 percent. For farmland, the FEIS ROD disclosed the conversion of 723 acres to transportation use, while the new parcel acquisitions will increase the amount of farmland converted by approximately 1.4 percent. Given the varied quality and amount of additional undeveloped desert, desert landscaping, and farmlands representing potential wildlife habitat that will be impacted, these increases do not represent a meaningful change in the impacted habitat already disclosed in the FEIS/ROD and Biological Evaluation. Furthermore, because the new parcels are not being acquired due to substantial changes in location, length, width, or configuration of the project, the impacts to wildlife connectivity and habitat fragmentation will not worsen compared to the impacts described in the FEIS/ROD.

To prevent impacts to individual members of protected species, the new parcels will be subjected to pre-construction surveys in accordance with the project's Technical Provisions. To prevent impacts to other protected species, the new ROW and TCE parcels will be subjected to pre-construction surveys in accordance with the project's Technical Provisions. Any wildlife encountered in harm's way will be relocated or transferred to a properly-licensed wildlife rehabilitator as necessary in accordance with the

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

project's Technical Provisions and applicable wildlife laws/regulations. No new mitigation measures are required for impacts on biological resources as a result of these project changes.

3.7 Cultural Resources

Cultural resources surveys of the new parcels were conducted in November 2016 and documented in *A Class III Cultural Resource Survey of 50 Parcels for the Loop 202–South Mountain Freeway Environmental Impact Statement Reevaluation, Maricopa County, Arizona* (Bowler et al. 2017). No significant cultural resources were identified.

In accordance with the programmatic agreement (PA) developed among FHWA, Arizona State Historic Preservation Office, and ADOT (executed July 21, 2015), Section 106 consultation has occurred with the following agencies listed below as part of this reevaluation:

- Ak-Chin Indian Community
- Arizona State Land Department
- Arizona State Museum
- Army Corps of Engineers
- City of Avondale
- Bureau of Indian Affairs
- Bureau of Land Management
- City of Chandler
- Chemehuevi Tribe
- City of Phoenix Archaeology Section
- City of Phoenix Historic Preservation Office
- Colorado River Indian Tribes
- Flood Control District of Maricopa County
- Fort Mojave Indian Tribe
- Fort McDowell Yavapai Nation
- Forty Yuma Quechan Tribe
- City of Glendale
- Gila River Indian Community
- Havasupai Tribe
- Hopi Tribe
- Hualapai Tribe
- Kaibab Band of Paiute Indians
- Maricopa County Department of Transportation
- Navajo Nation
- Pascua Yaqui Tribe
- Bureau of Reclamation
- Roosevelt Irrigation District
- San Juan Southern Paiute
- State Historic Preservation Office
- Salt River Project
- Salt River Pima-Maricopa Indian Community
- Tonto Apache Tribe
- City of Tolleson
- Tohono O'odham Nation
- Western Area Power Administration
- Yavapai-Apache Nation
- Pueblo of Zuni

Responding parties have concurred with the adequacy of the cultural resources survey report and its findings (refer to Appendix-B Section 106 Consultation Summary).

3.8 Prime and Unique Farmland

New parcels 37a, 37b, and 43 are farmland that will be converted to transportation use. As previously discussed in the land use section, the amount of farmland being impacted by the project is increasing by 9.74 acres or 1.3 percent over the impacts originally disclosed in the FEIS/ROD. To report this change in impacts, a revised Farmland Conversion Impact Rating for Corridor Type Projects form (NRCS-CPA-106) was submitted to the Natural Resources Conservation Service (NRCS). This change to the loss of agricultural land is negligible relative to the amount of land in the region and to other land development

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

trends that are contributing to the loss of agricultural land. NRCS provided a letter on May 18, 2017 stating that the additional impacts to farmlands are exempt because the area is already in or committed to urban development (see Appendix C). No new mitigation measures are required for impacts on farmland as a result of these project changes.

3.9 Hazardous Materials

A Draft Initial Site Assessment for hazardous materials was completed in November 2012 and was updated in an addendum in June 2014 as part of the FEIS/ROD for the Project. In addition, Phase 1 environmental site assessments have been completed for all but three of the parcels in Table 1. Parcels still requiring additional investigation include: 7-11445, 7-11607, and 7-11541. Therefore, per the Technical Provisions, the contractor shall not access new parcels until the Phase I environmental site assessments have been completed and approved by ADOT. Prior to personnel conducting or observing ground disturbing activities on high-risk areas, they shall possess a 40-hour HAZWOPER training/certification.

3.10 Visual Resources

The features constructed within the new parcels do not represent a material change in the project scope and will not introduce new or worsened impacts to the landscape character or viewsheds in the project area. No new mitigation measures are required for impacts on visual resources as a result of these project changes.

3.11 Temporary Construction Impacts

The new parcels are located adjacent to the ROW limits described in the FEIS/ROD and are therefore in areas where temporary construction impacts have already been disclosed. The previously disclosed impacts involving temporary construction noise and disruption to the pre-construction traffic patterns, for example, will not be materially worsened. No new mitigation measures are required for temporary construction impacts as a result of these project changes.

3.12 Material Sources and Waste Material

Some new parcels will undergo excavation for the construction of stormwater facilities. The material generated from these excavations will be recycled into road fills elsewhere in the project or disposed offsite at a permitted facility. Should hazardous materials investigations identify regulated waste in the excavation sites, the material will be handled in accordance with the project's Technical Provisions. No new mitigation measures are required for impacts related to material sources and waste material as a result of these project changes.

4.0 New commitments related to New Parcel Acquisitions

The commitments listed below will be implemented and tracked along with the commitments and mitigation measures presented in the ROD and incorporated as necessary into the contractual technical provisions for the Project.

- The contractor shall not access the new parcels until ADOT provides permission.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

- The contractor shall disclose future changes in rights-of-way and easement requirements for the project to ADOT as they are identified.

5.0 Public/Agency Outreach

Changes to the project related to the acquisition of new rights-of-ways and easements does not require an additional public hearing because the resulting change to impacts from those disclosed in the FEIS/ROD are not substantial as discussed in the Environmental Consequences section of this reevaluation.

6.0 Conclusion and Recommendation

6.1 Conclusion

A Supplemental FEIS is not warranted for the following reasons:

- The proposed modifications are limited in scope and impacts and are all within or adjacent to the ROW footprint analyzed in the FEIS/ROD.
- As a result of the modifications to the project described herein, no substantial changes to the Selected Alternative and its related impacts identified in the FEIS and ROD will occur.

6.2 Recommendations

FHWA, in coordination with ADOT, reevaluated the South Mountain Freeway, Interstate 10 (I- 10, Papago Freeway) to I-10 (Maricopa Freeway) FEIS and ROD per 23 CFR § 771.129. FHWA, with concurrence from ADOT, has determined that no substantial changes have occurred in the social, economic, or environmental impacts of the proposed action that would substantially impact the quality of the human, socioeconomic, or natural environment. Therefore, the original environmental document remains valid for the proposed action.

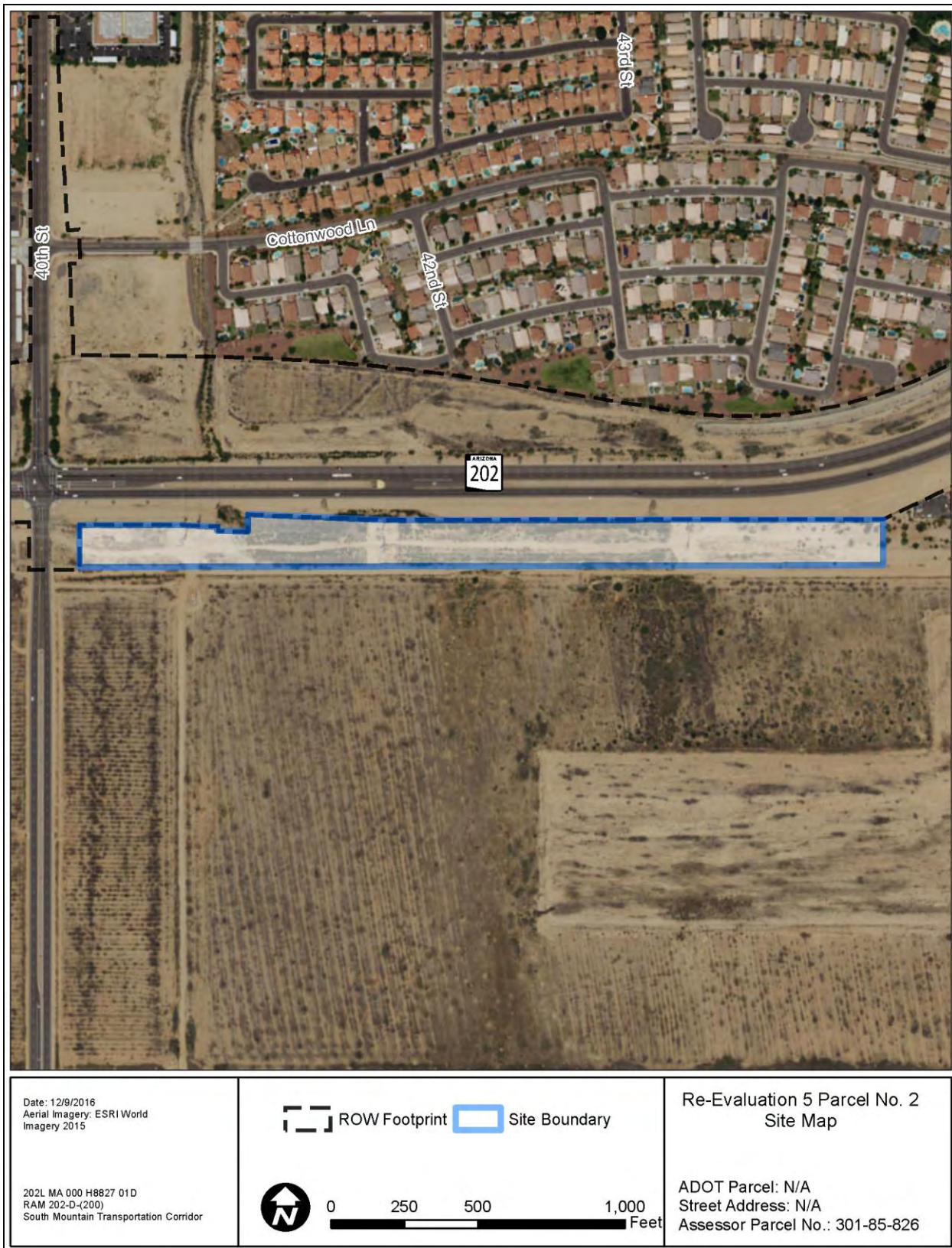
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FEIS/ROD Reevaluation #5 – Rev 2

Appendix-A Parcel Maps

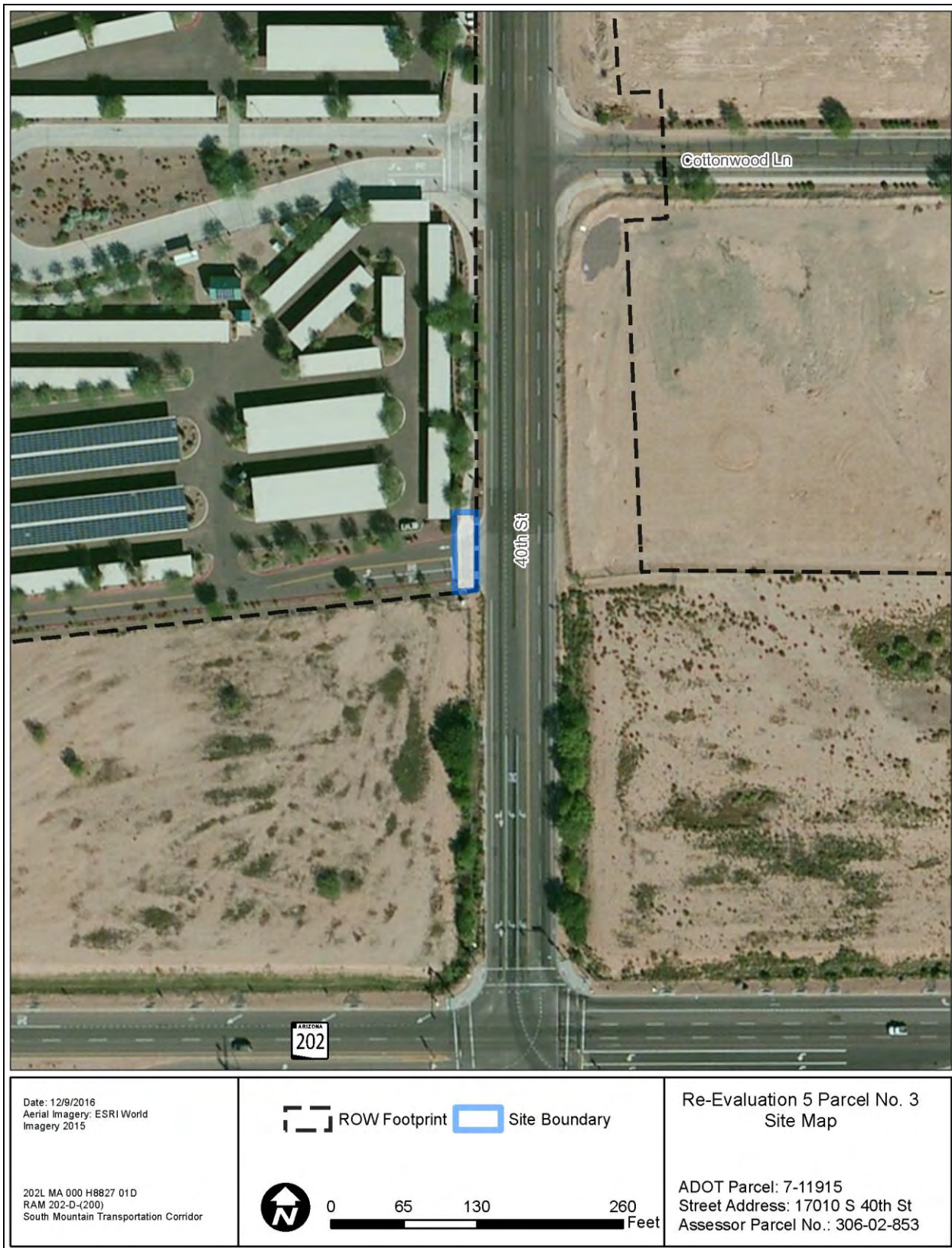
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FEIS/ROD Reevaluation #5 – Rev 2



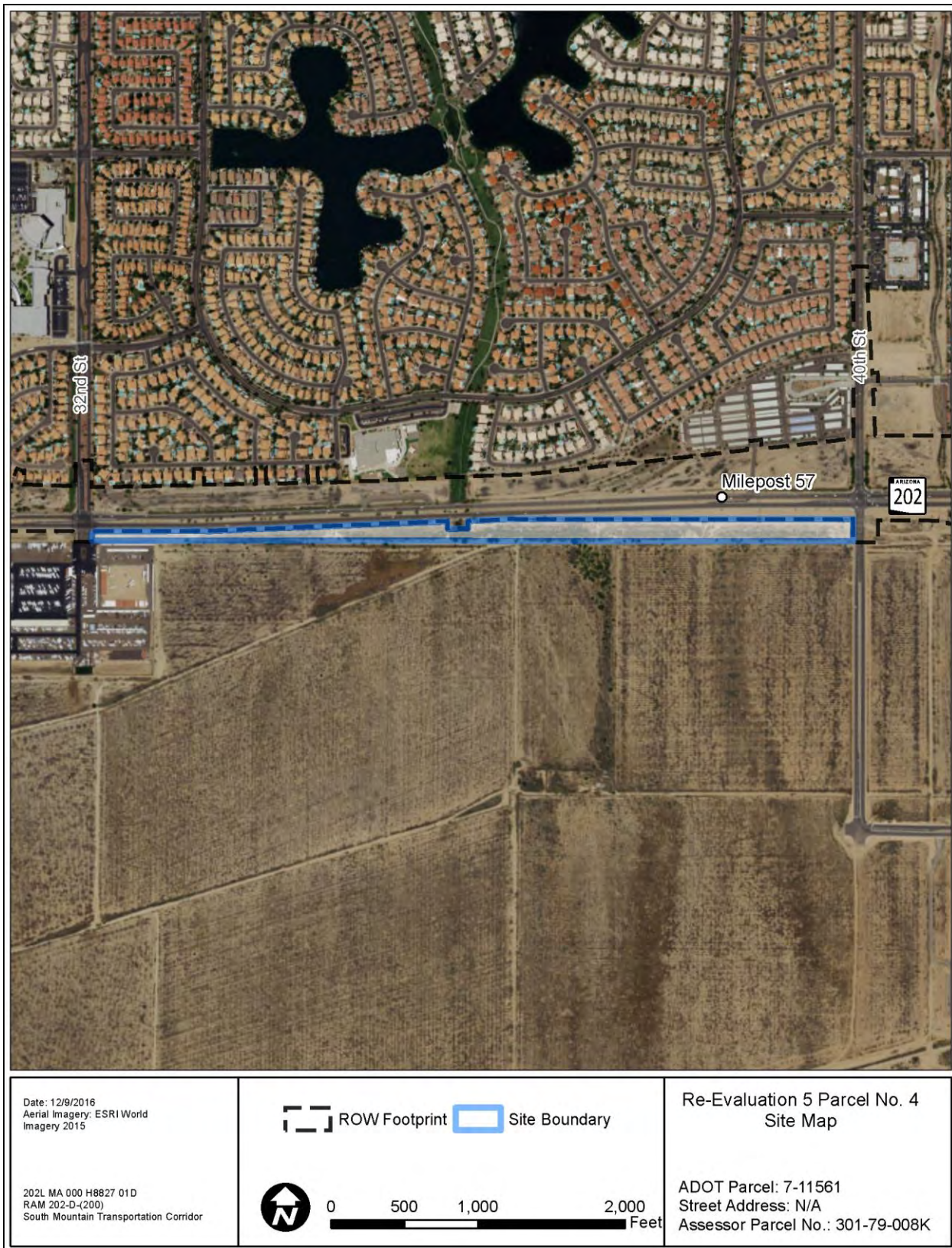
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FEIS/ROD Reevaluation #5 – Rev 2



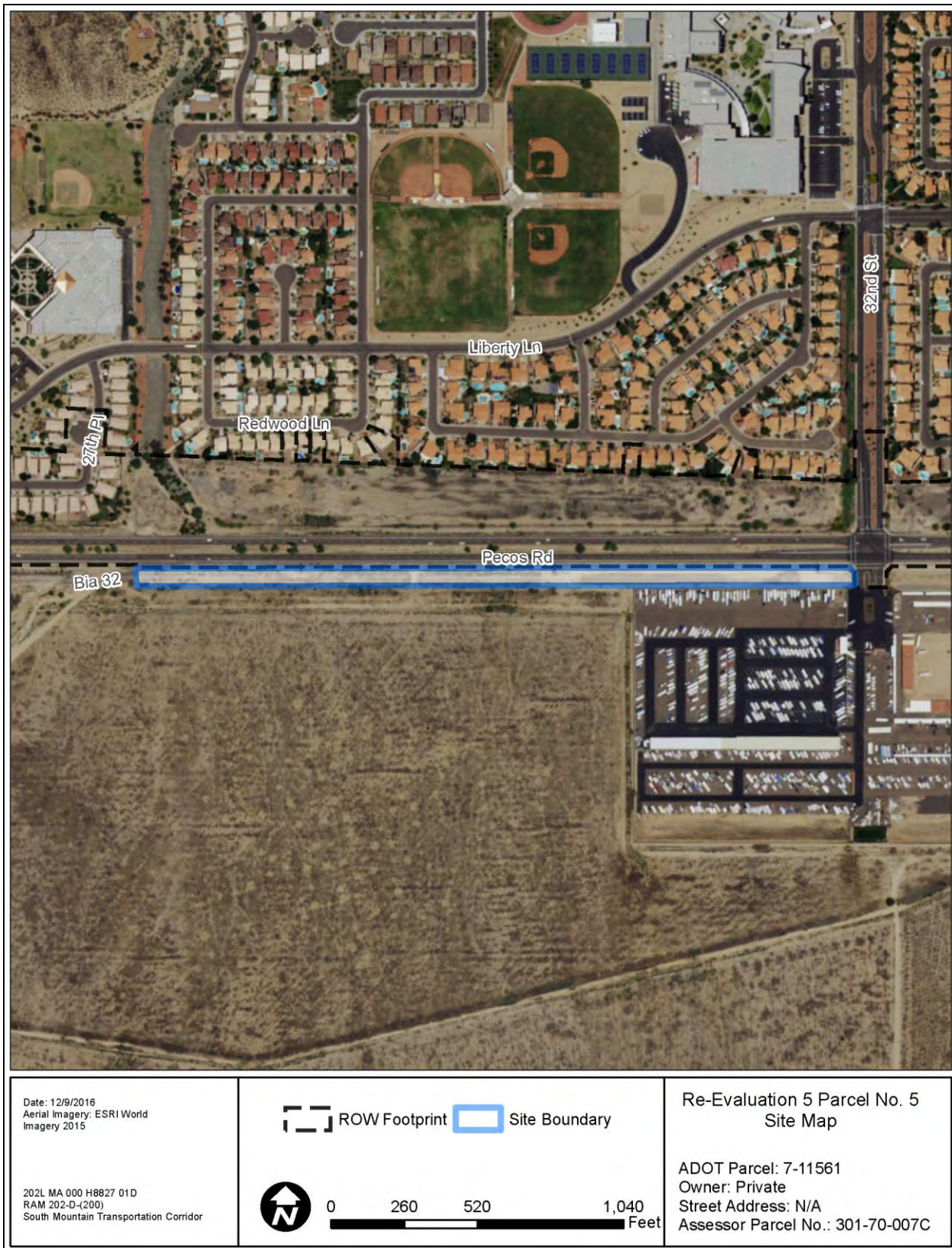
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FEIS/ROD Reevaluation #5 – Rev 2



SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2



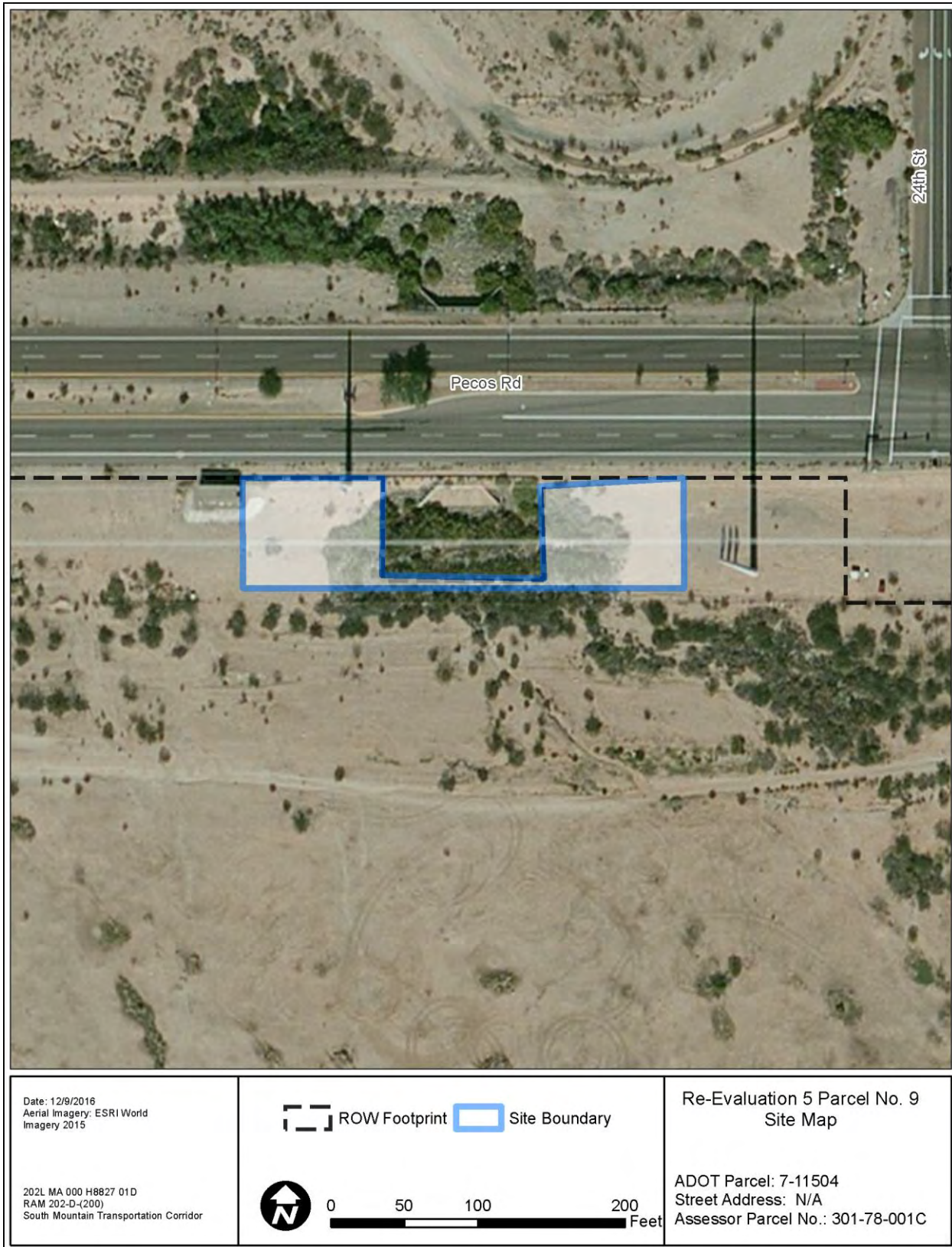
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FEIS/ROD Reevaluation #5 – Rev 2



SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2



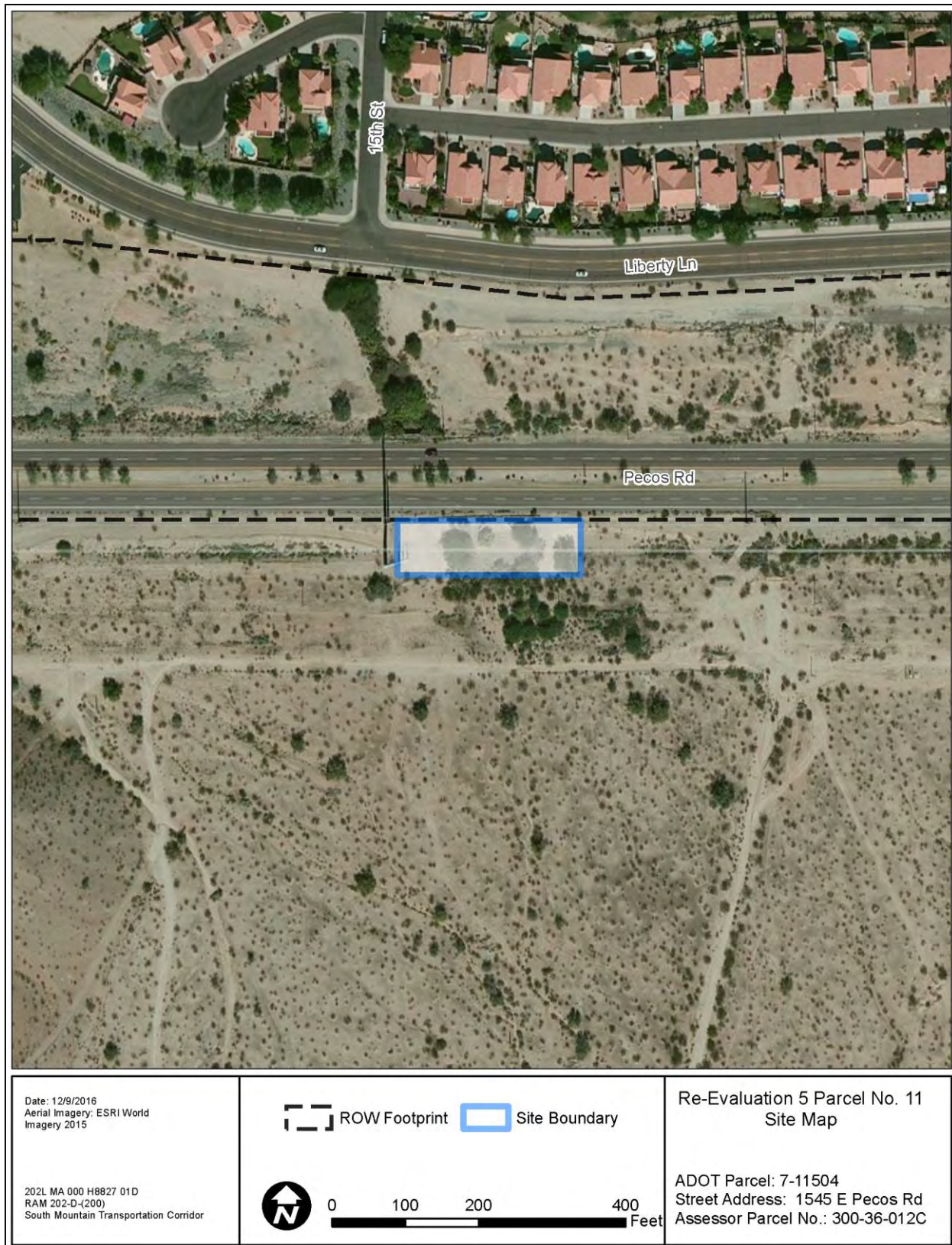
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FEIS/ROD Reevaluation #5 – Rev 2



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FEIS/ROD Reevaluation #5 – Rev 2



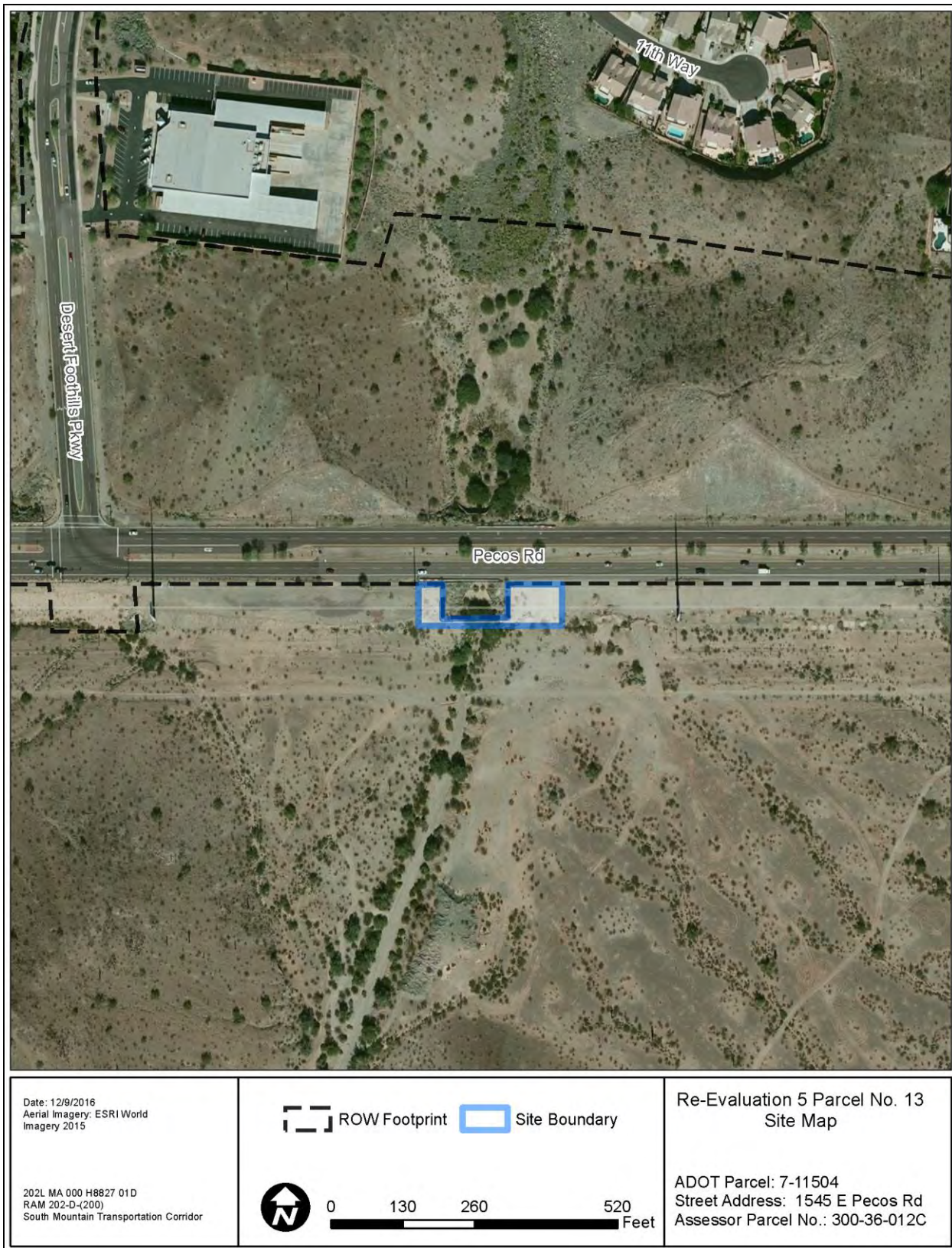
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FEIS/ROD Reevaluation #5 – Rev 2



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FEIS/ROD Reevaluation #5 – Rev 2



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FEIS/ROD Reevaluation #5 – Rev 2



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FEIS/ROD Reevaluation #5 – Rev 2



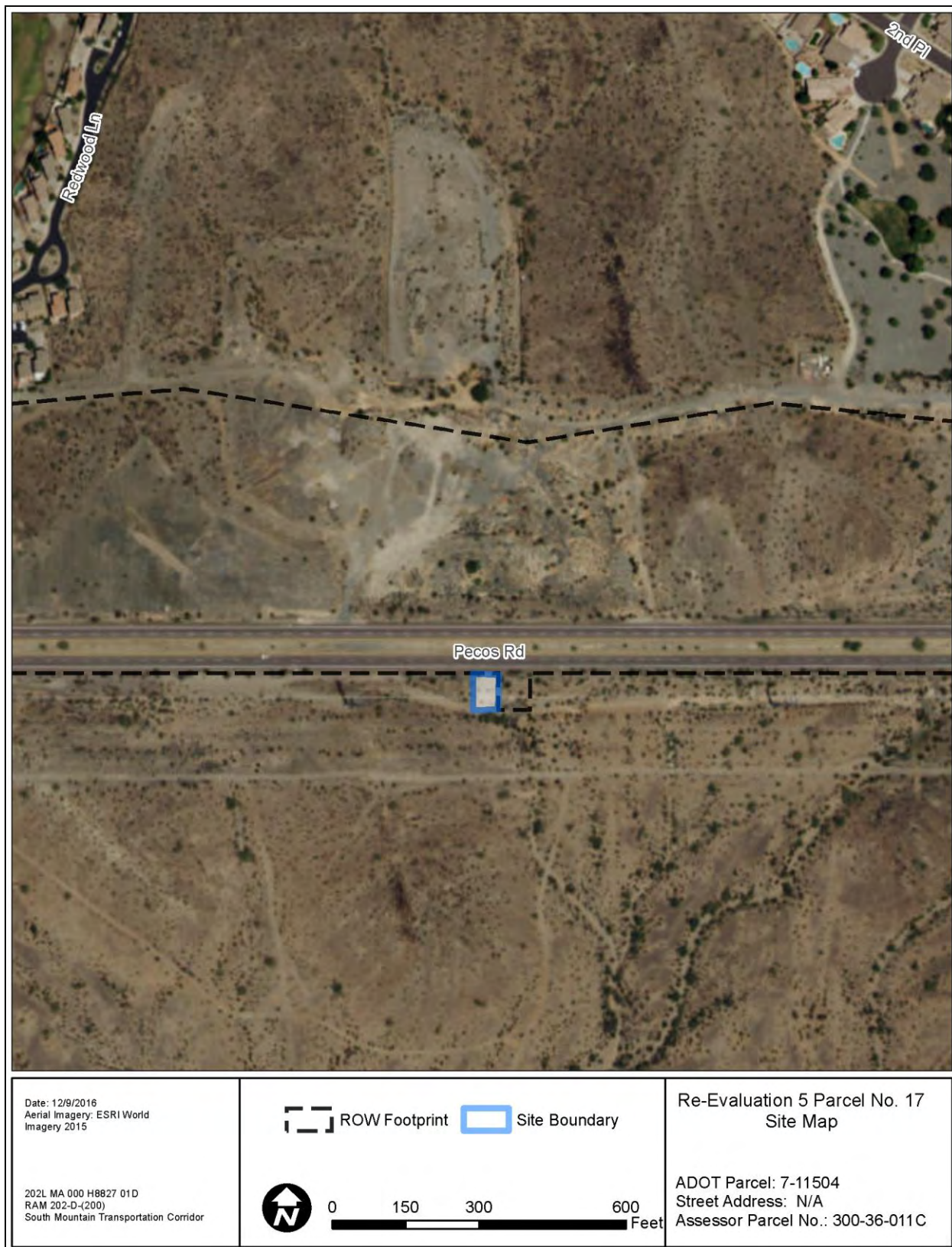
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FEIS/ROD Reevaluation #5 – Rev 2



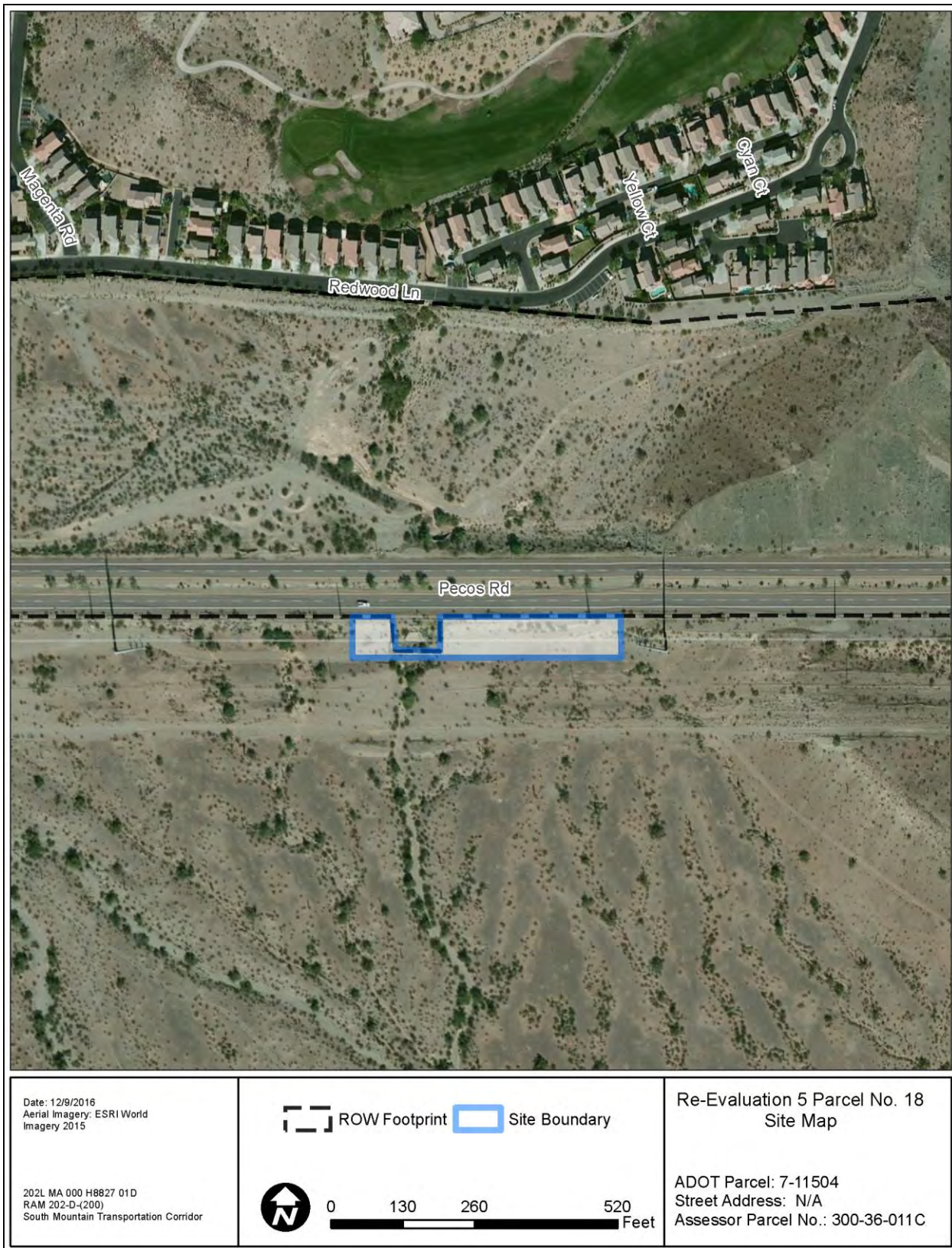
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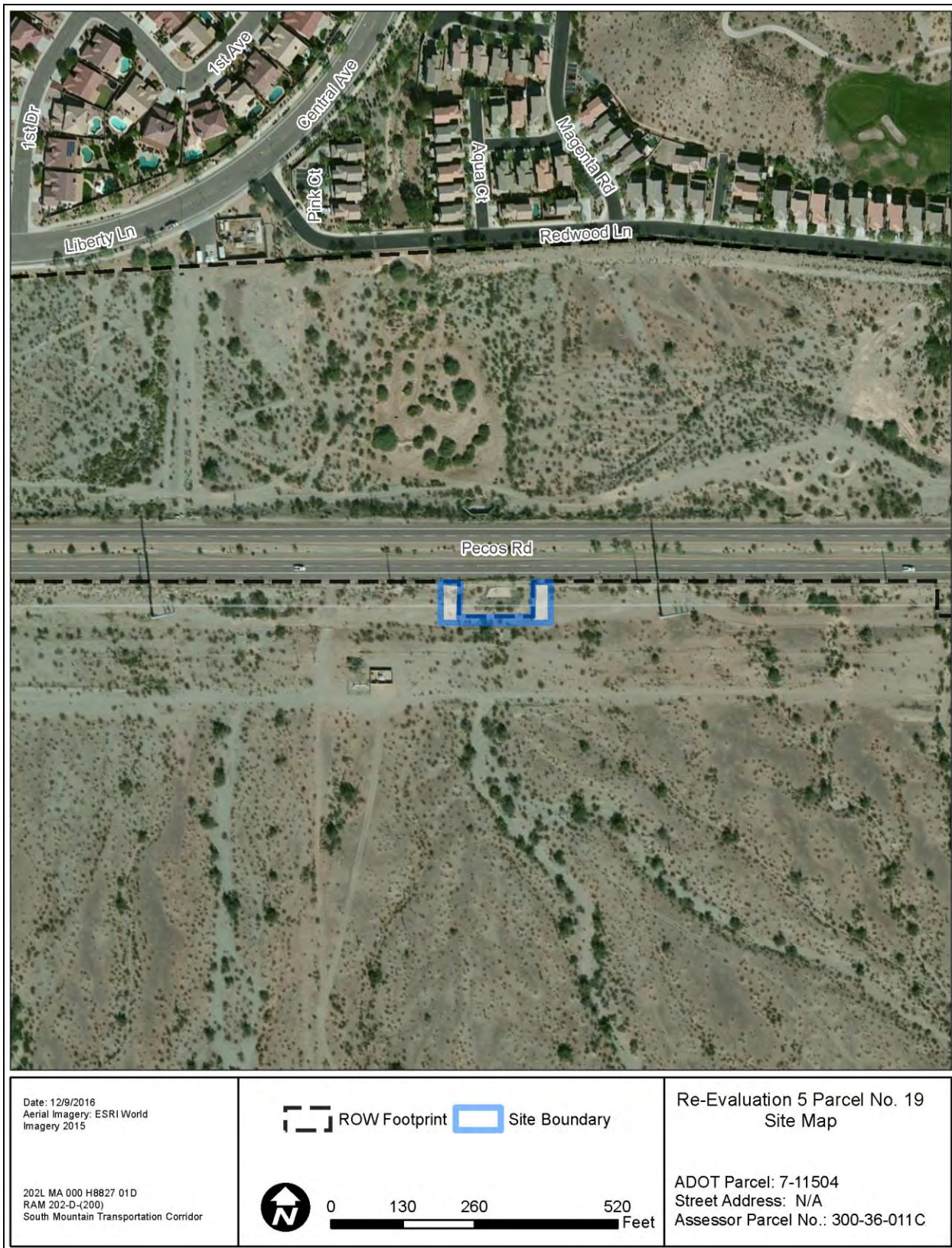
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FEIS/ROD Reevaluation #5 – Rev 2



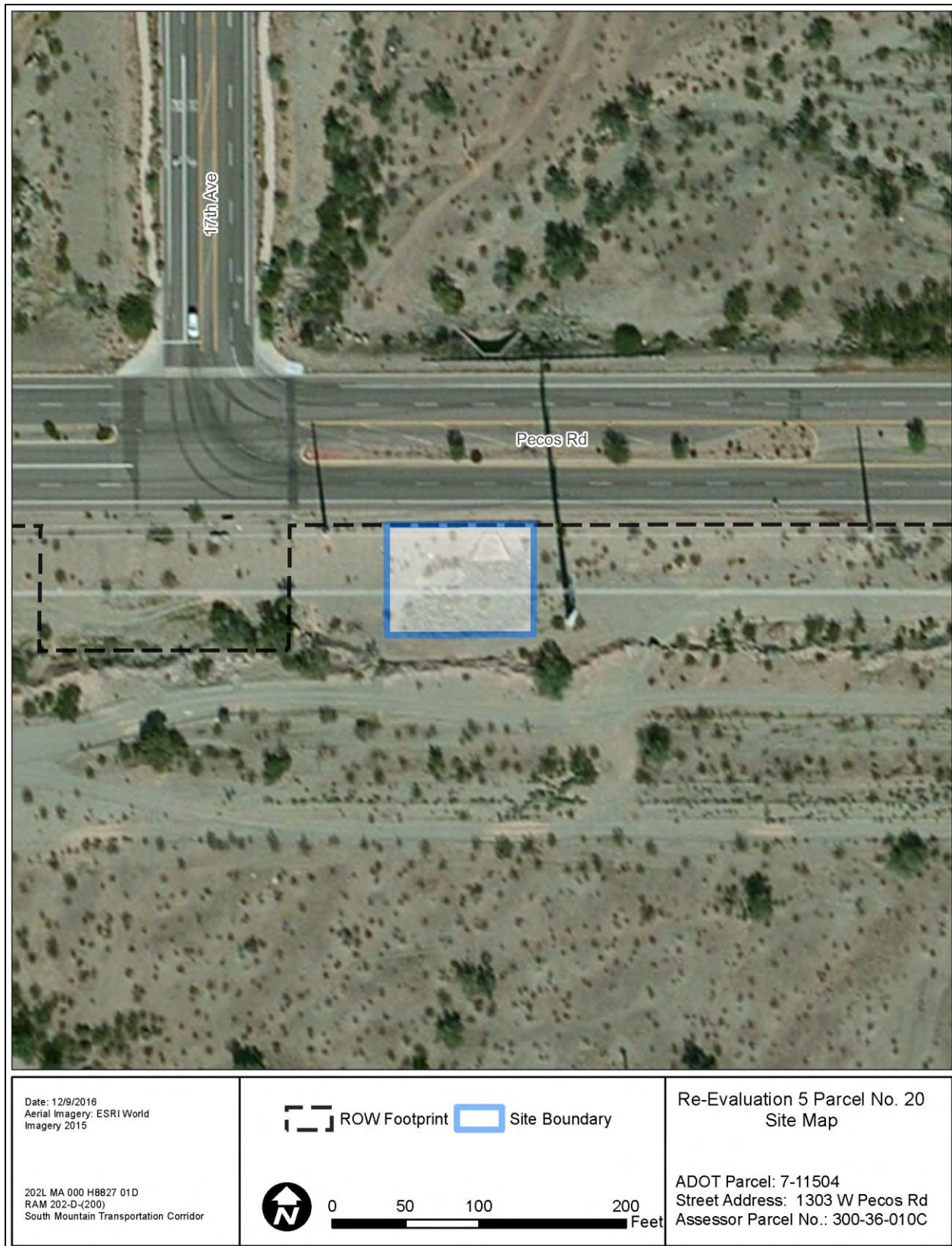
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FEIS/ROD Reevaluation #5 – Rev 2



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FEIS/ROD Reevaluation #5 – Rev 2



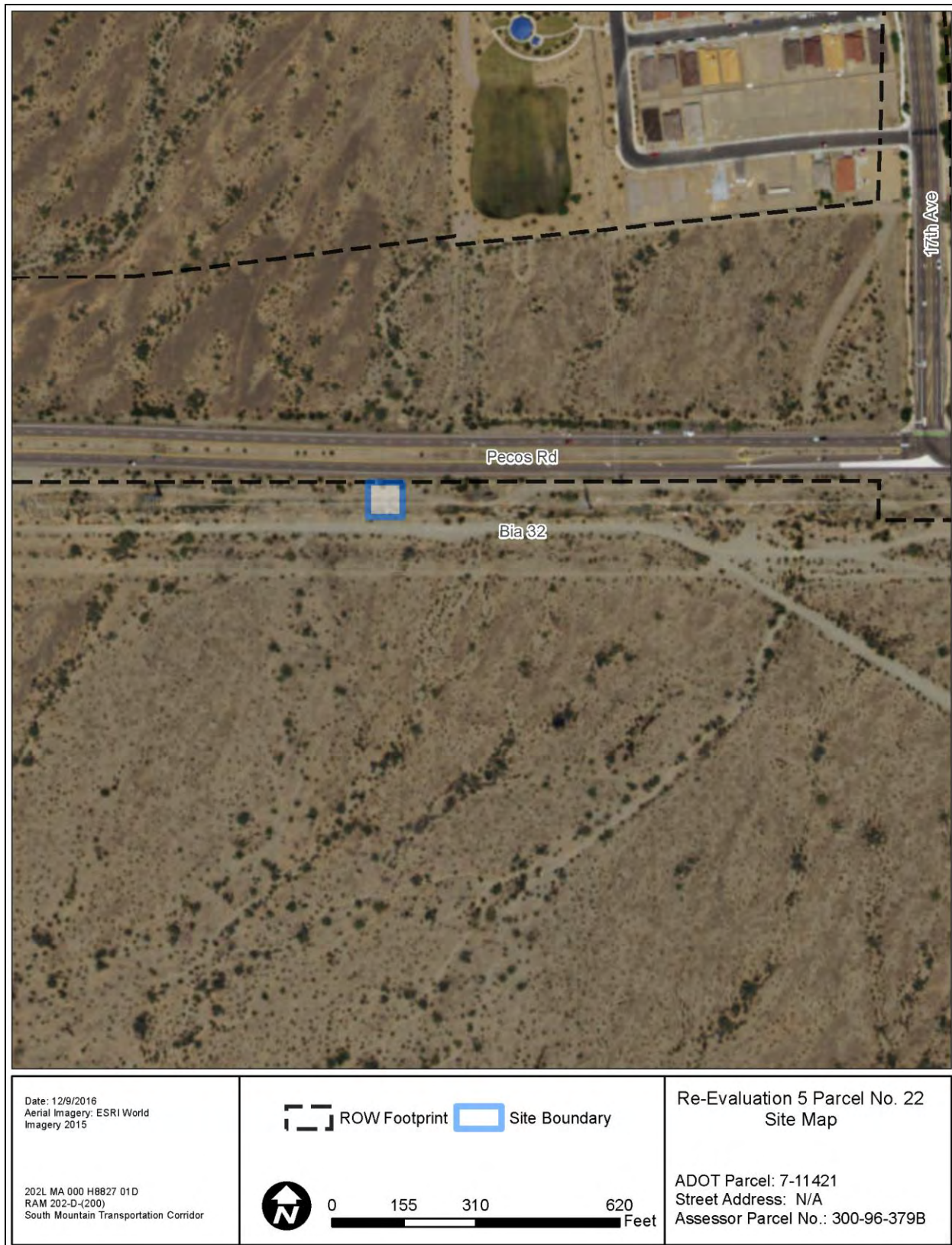
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FEIS/ROD Reevaluation #5 – Rev 2



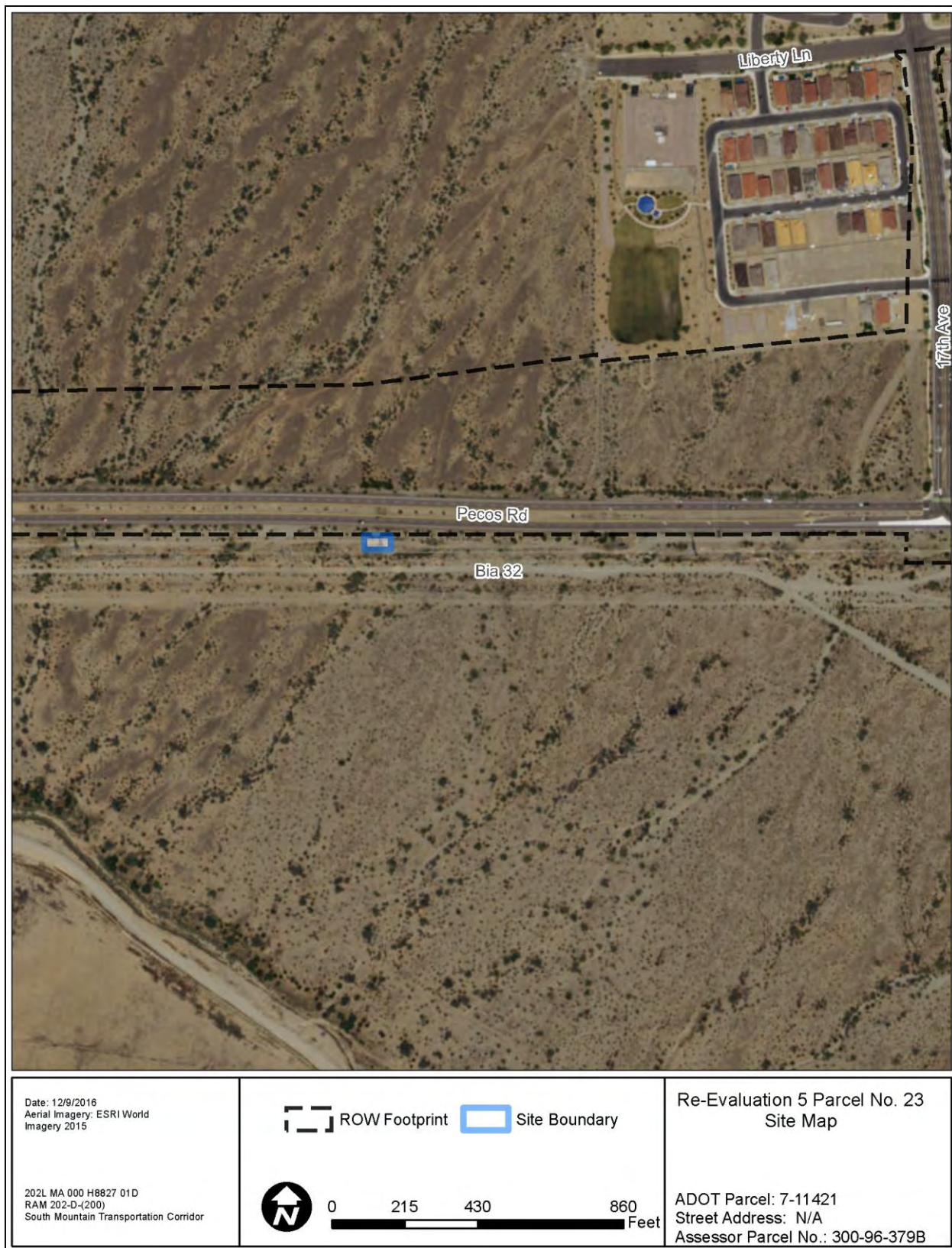
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FEIS/ROD Reevaluation #5 – Rev 2



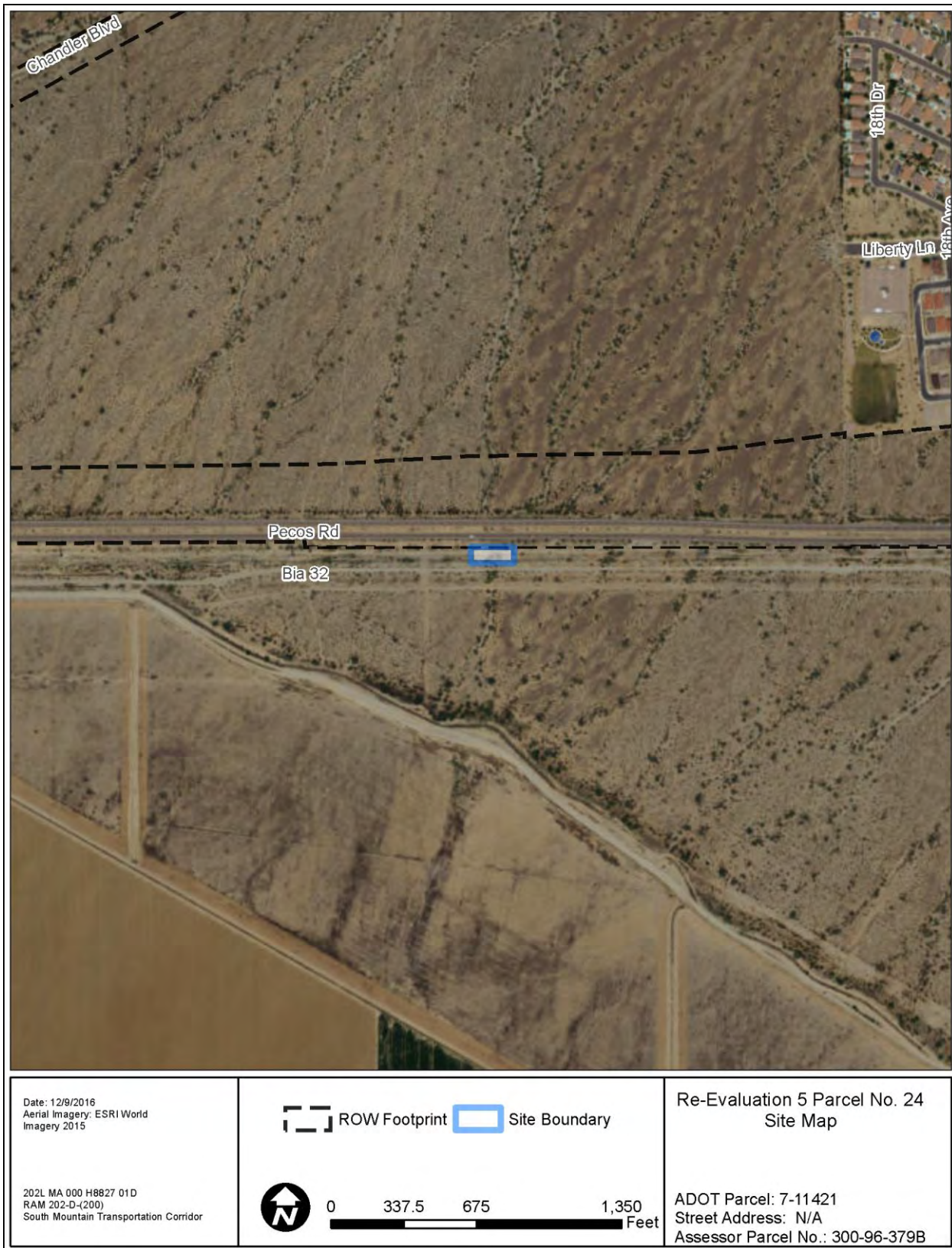
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FEIS/ROD Reevaluation #5 – Rev 2



SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2



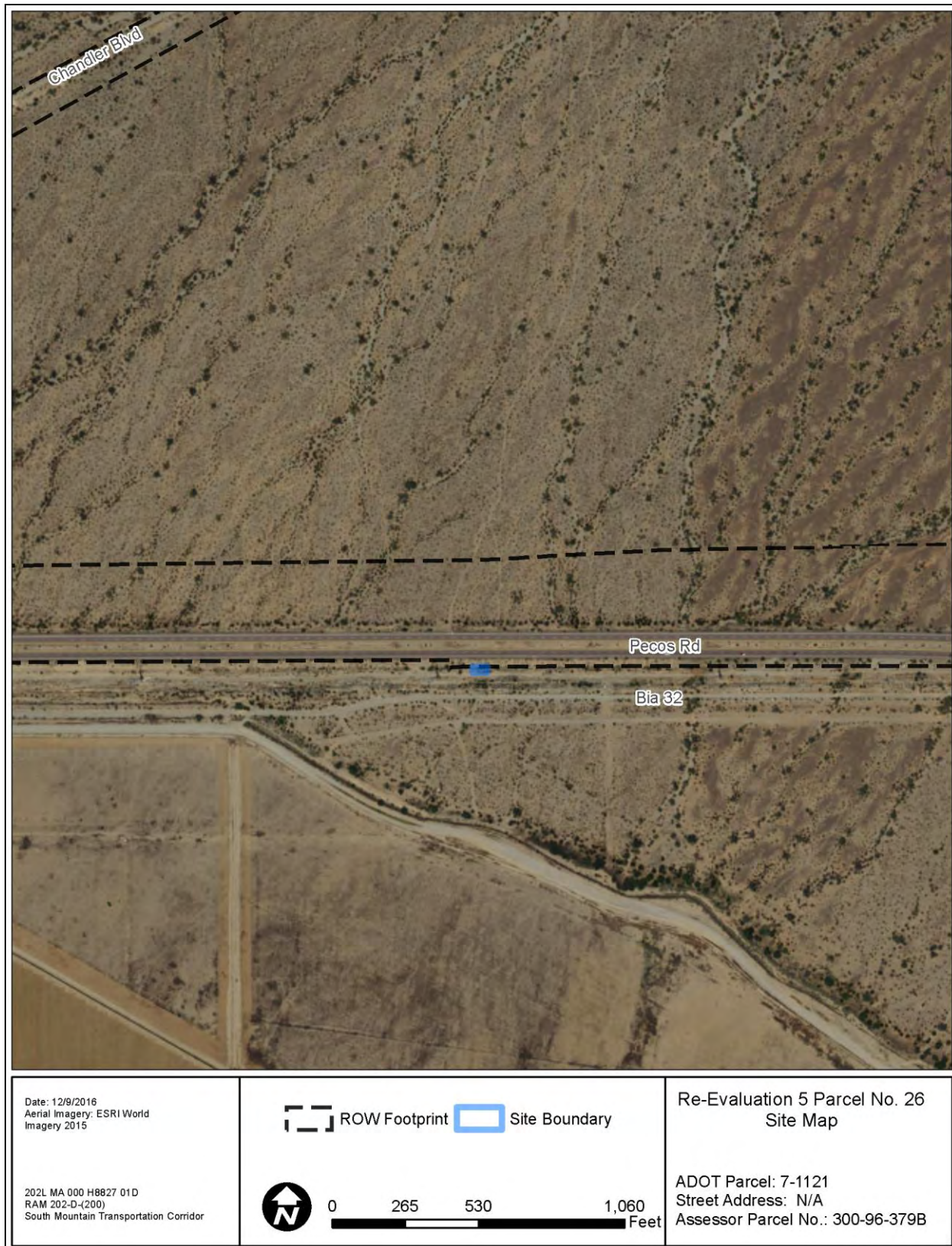
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FEIS/ROD Reevaluation #5 – Rev 2



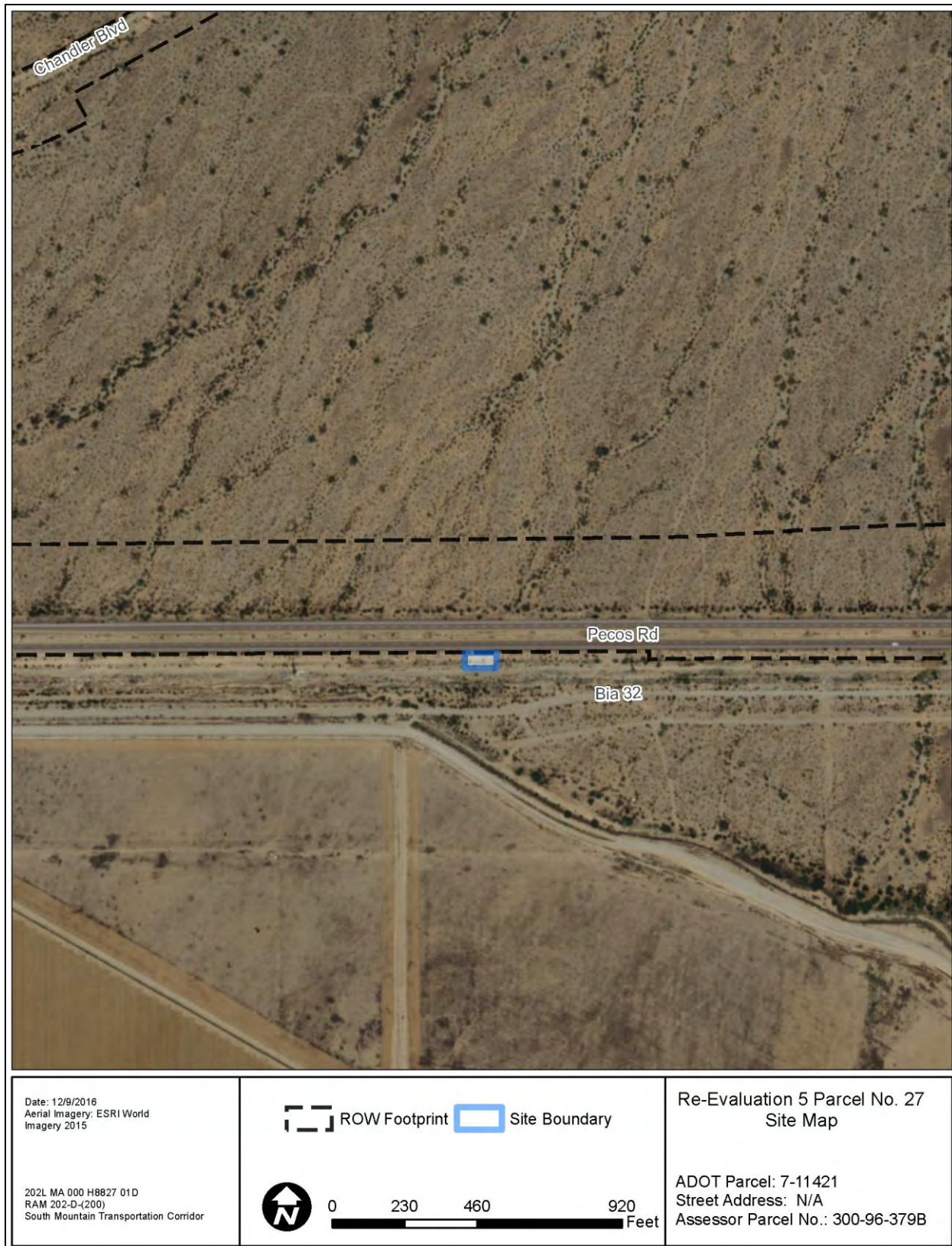
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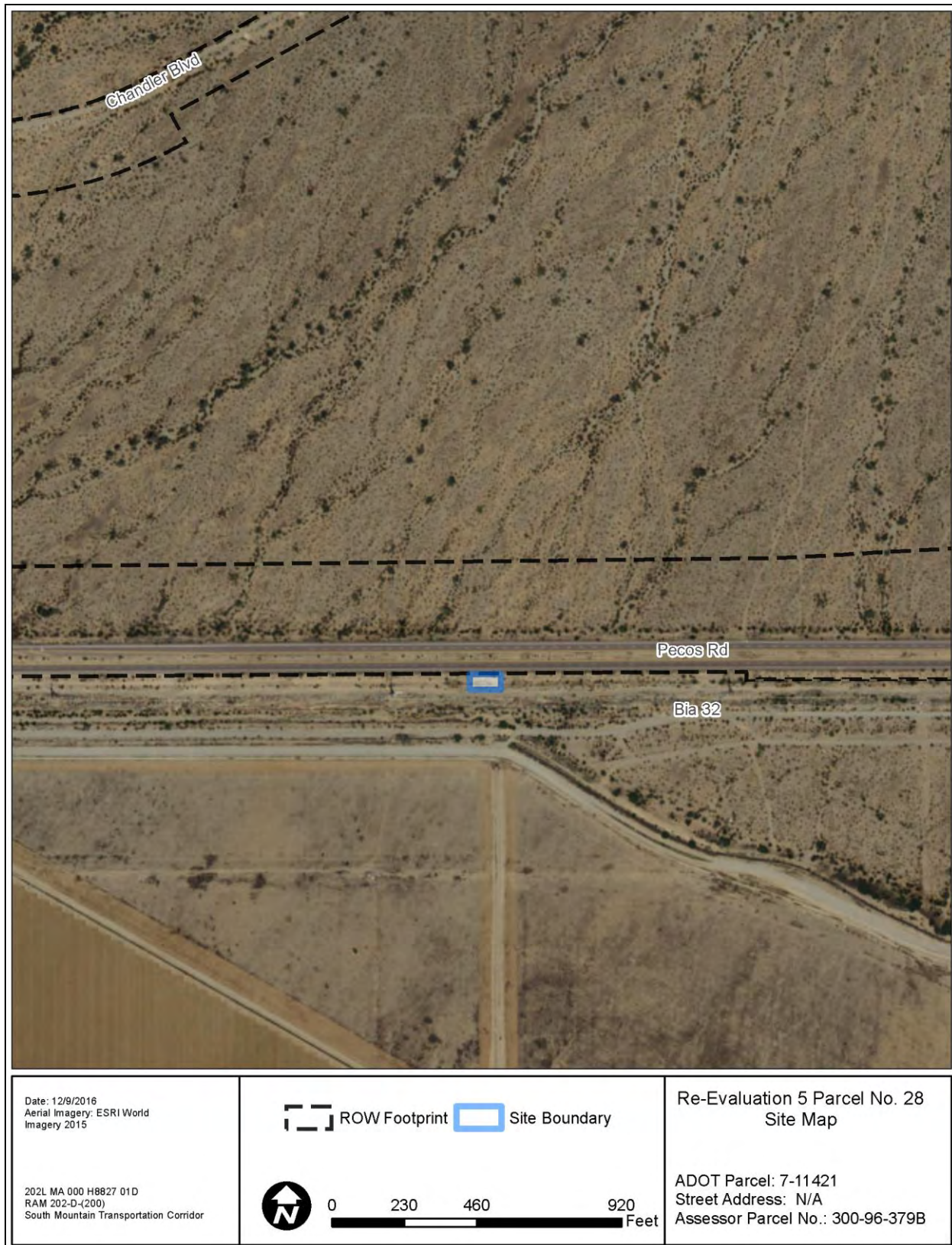
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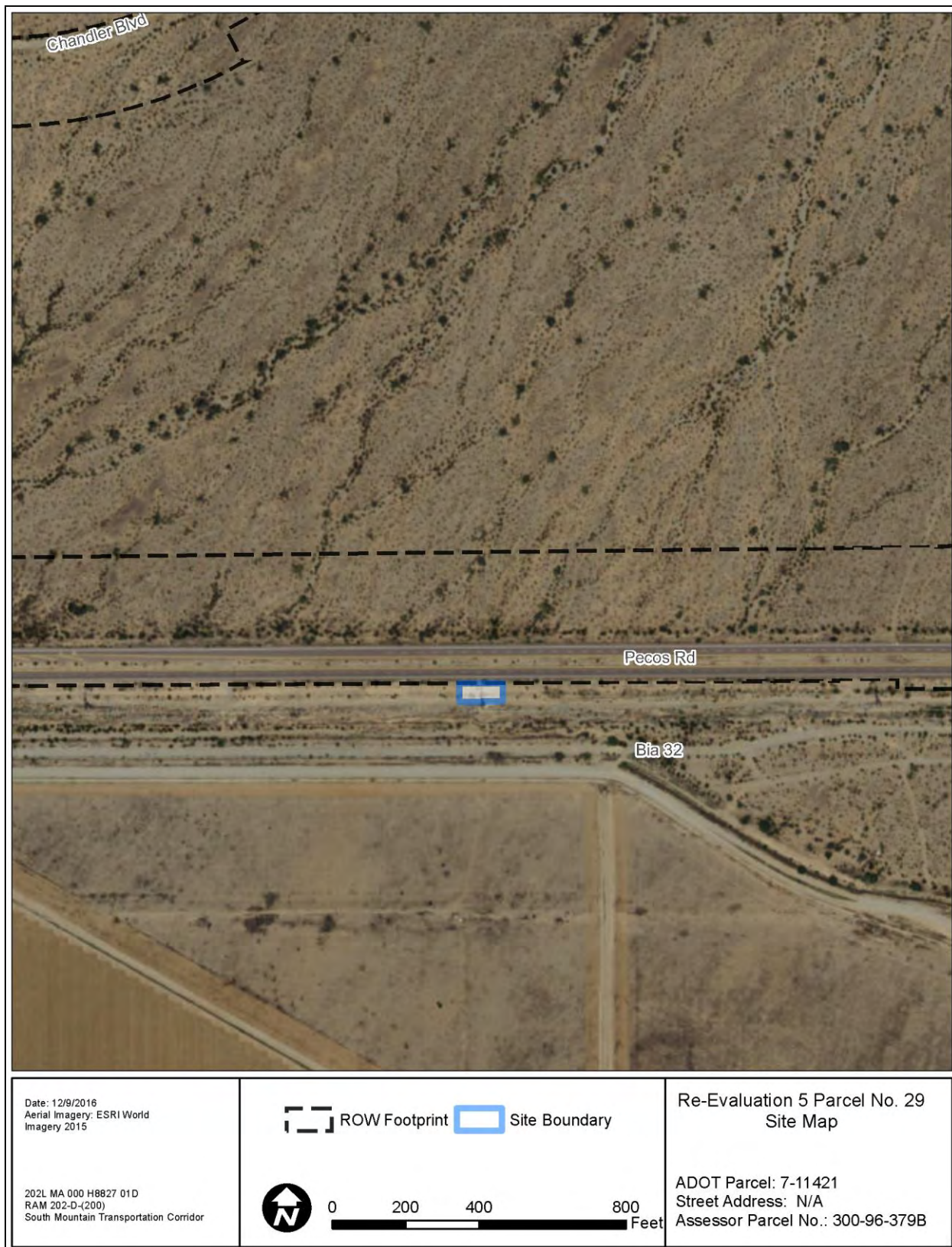
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FEIS/ROD Reevaluation #5 – Rev 2



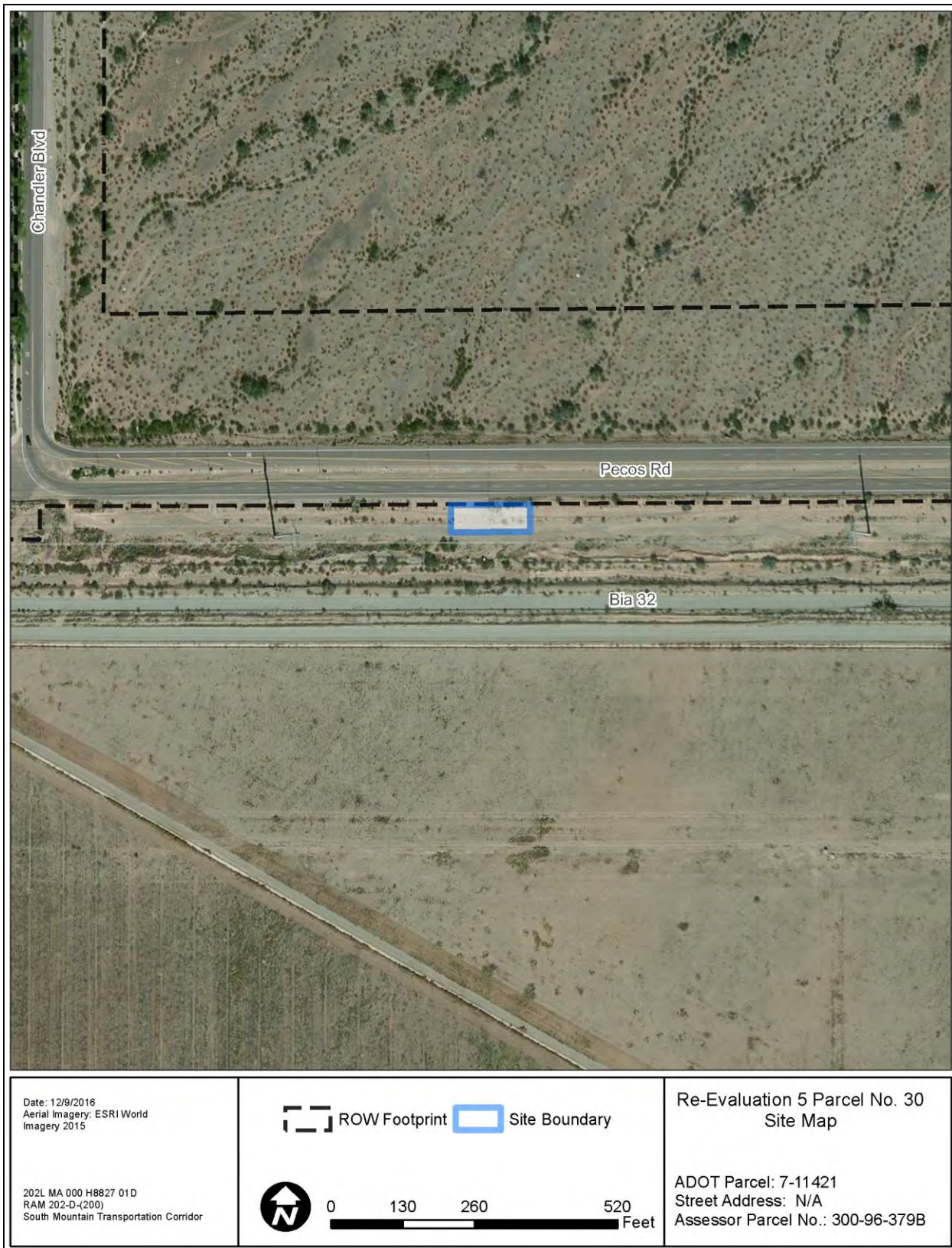
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FEIS/ROD Reevaluation #5 – Rev 2



SOUTH MOUNTAIN FREEWAY PROJECT

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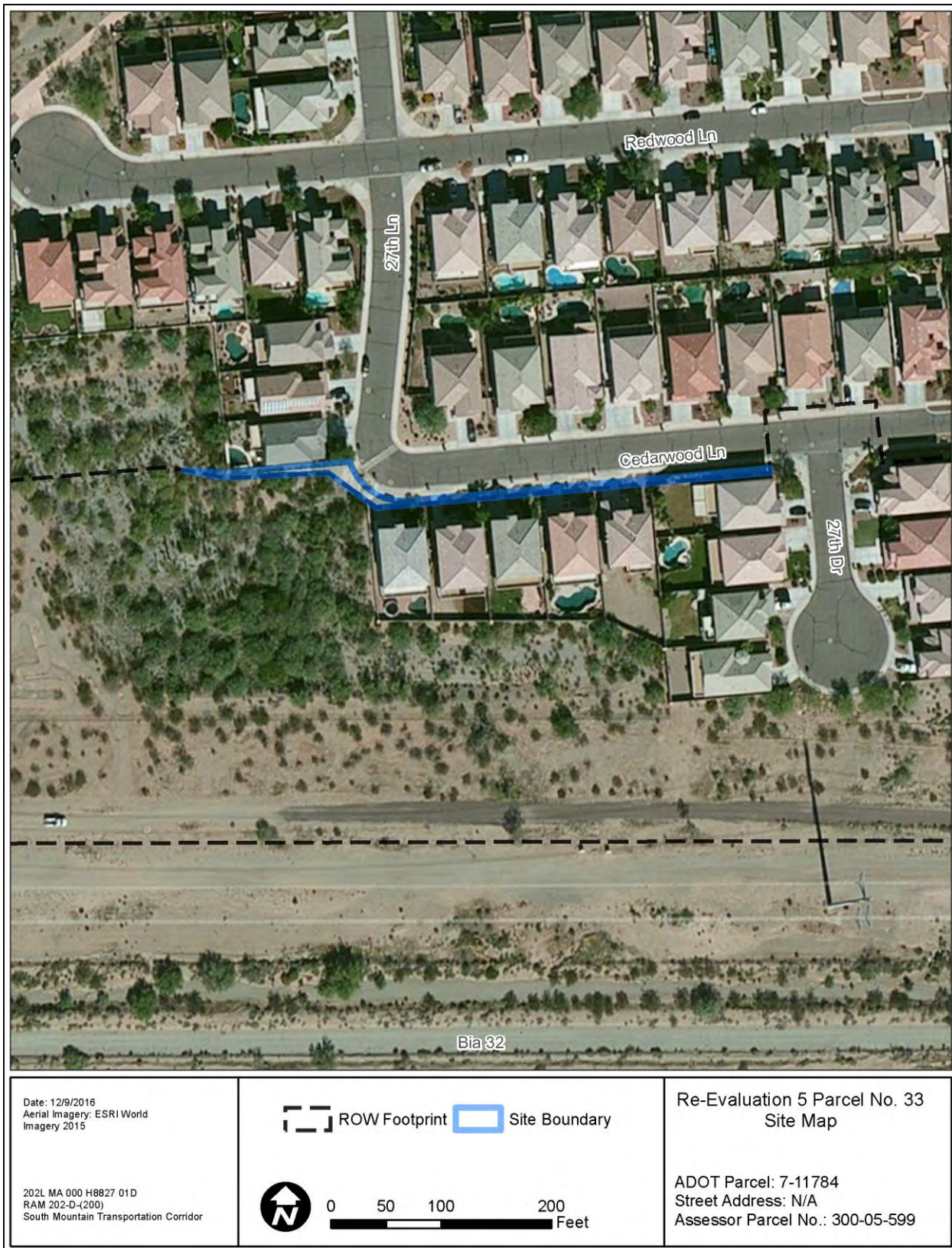
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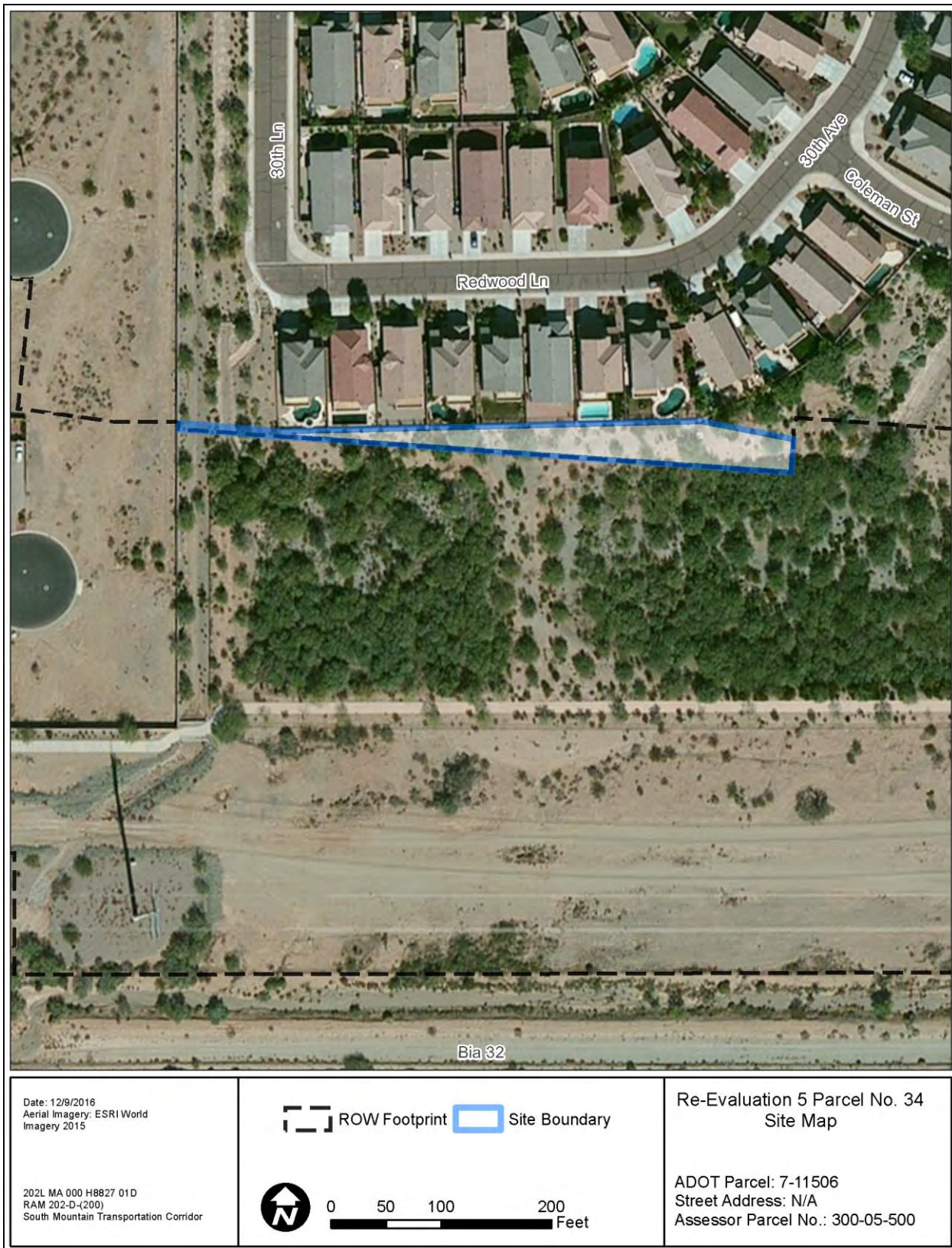
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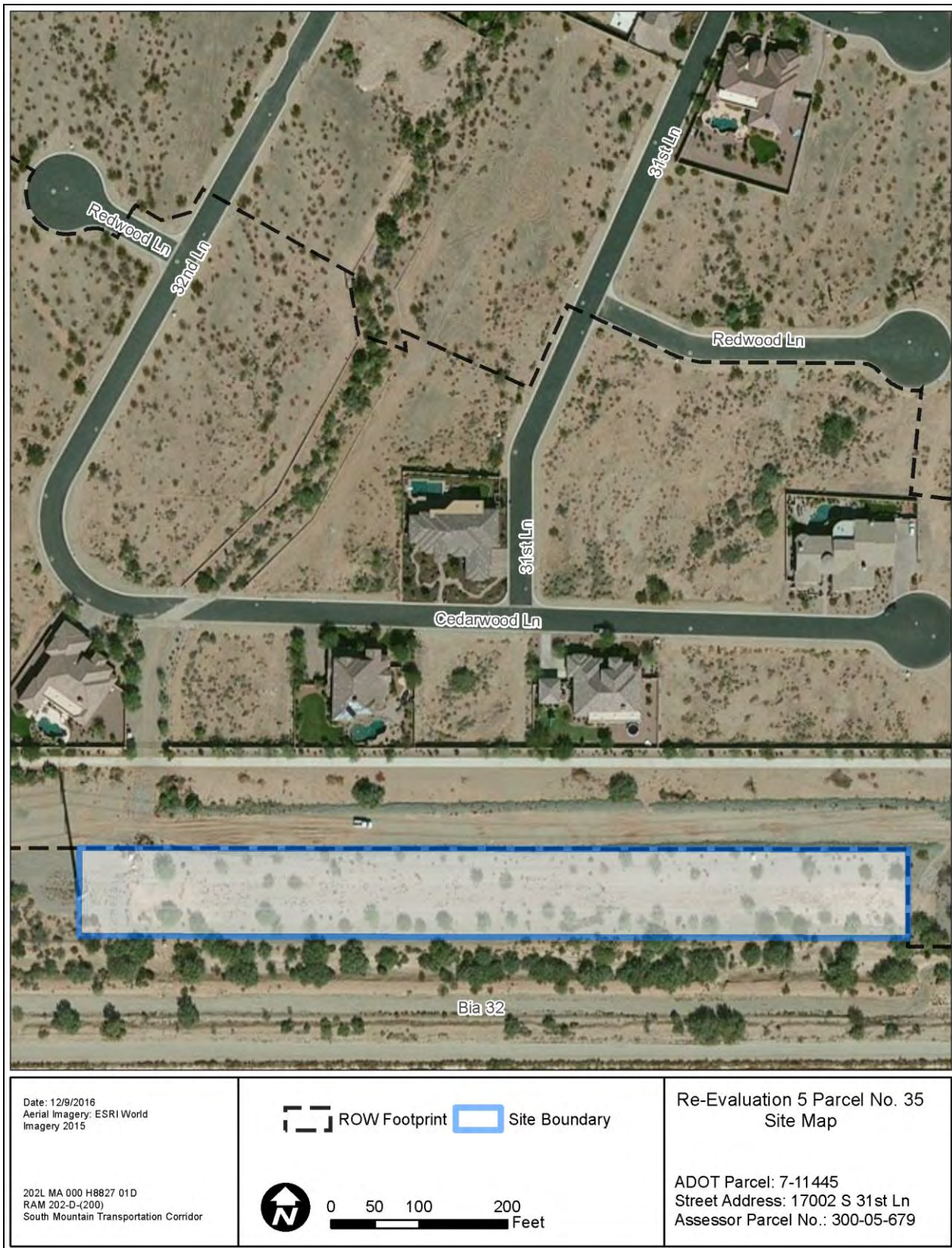
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FEIS/ROD Reevaluation #5 – Rev 2



SOUTH MOUNTAIN FREEWAY PROJECT

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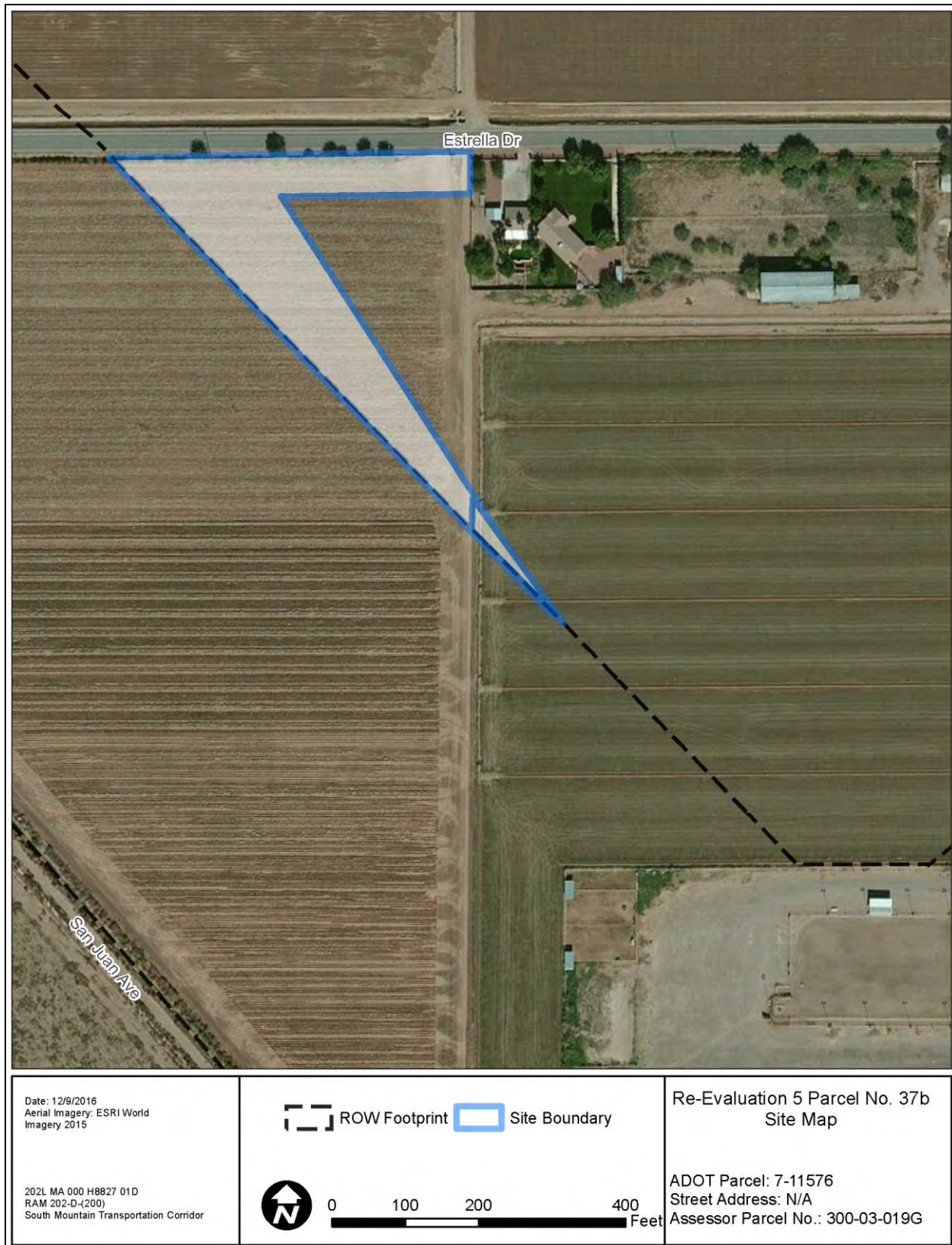
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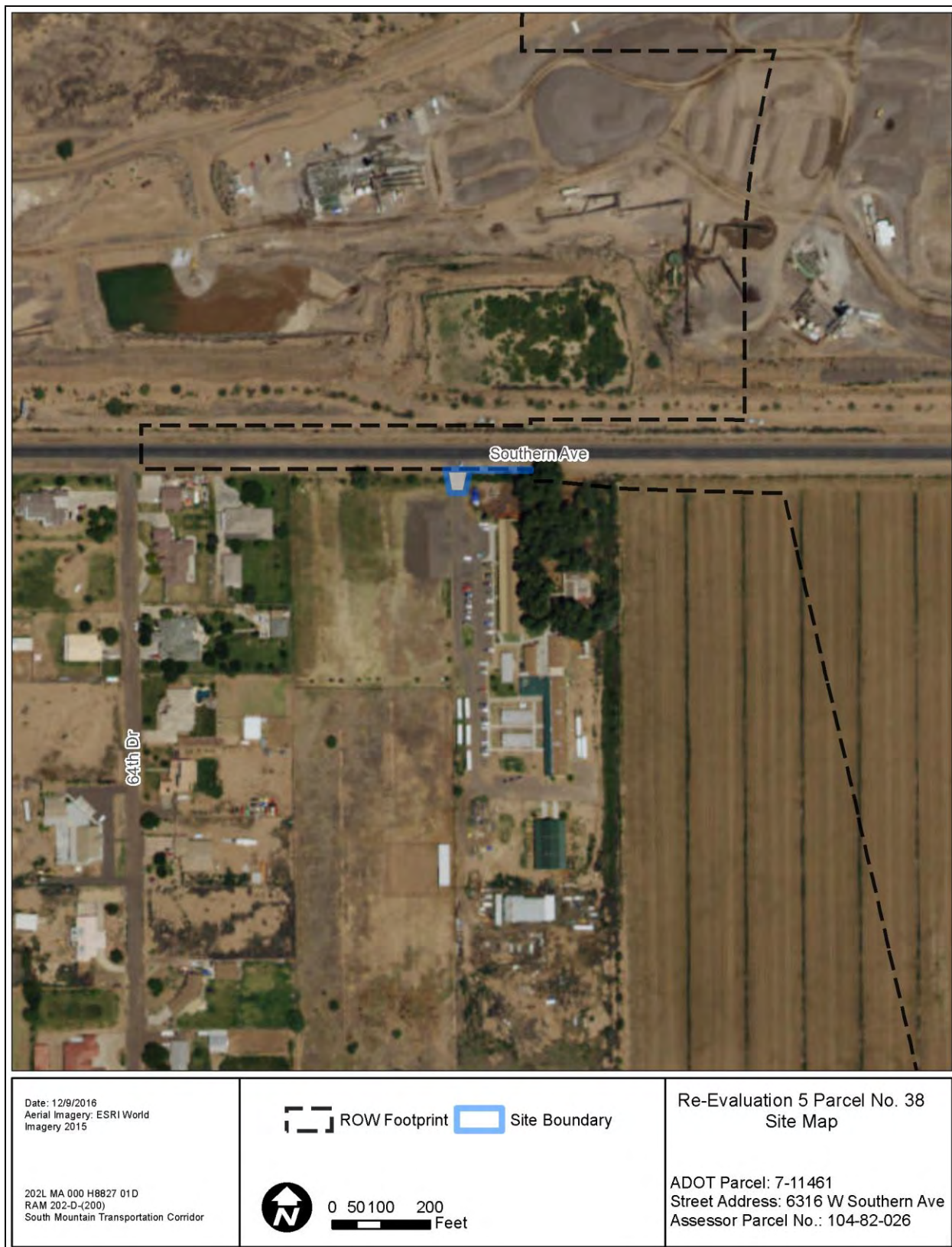
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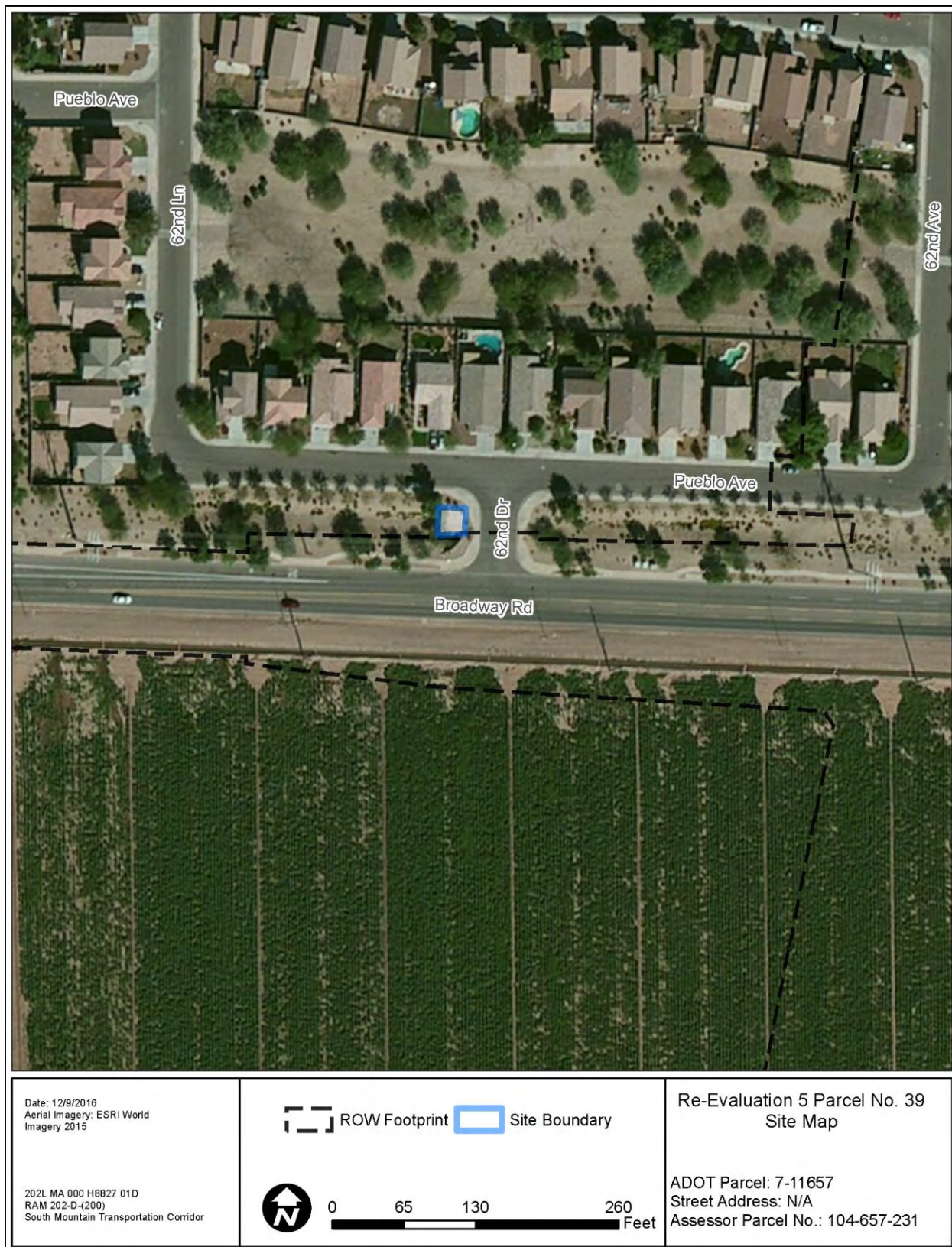
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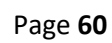


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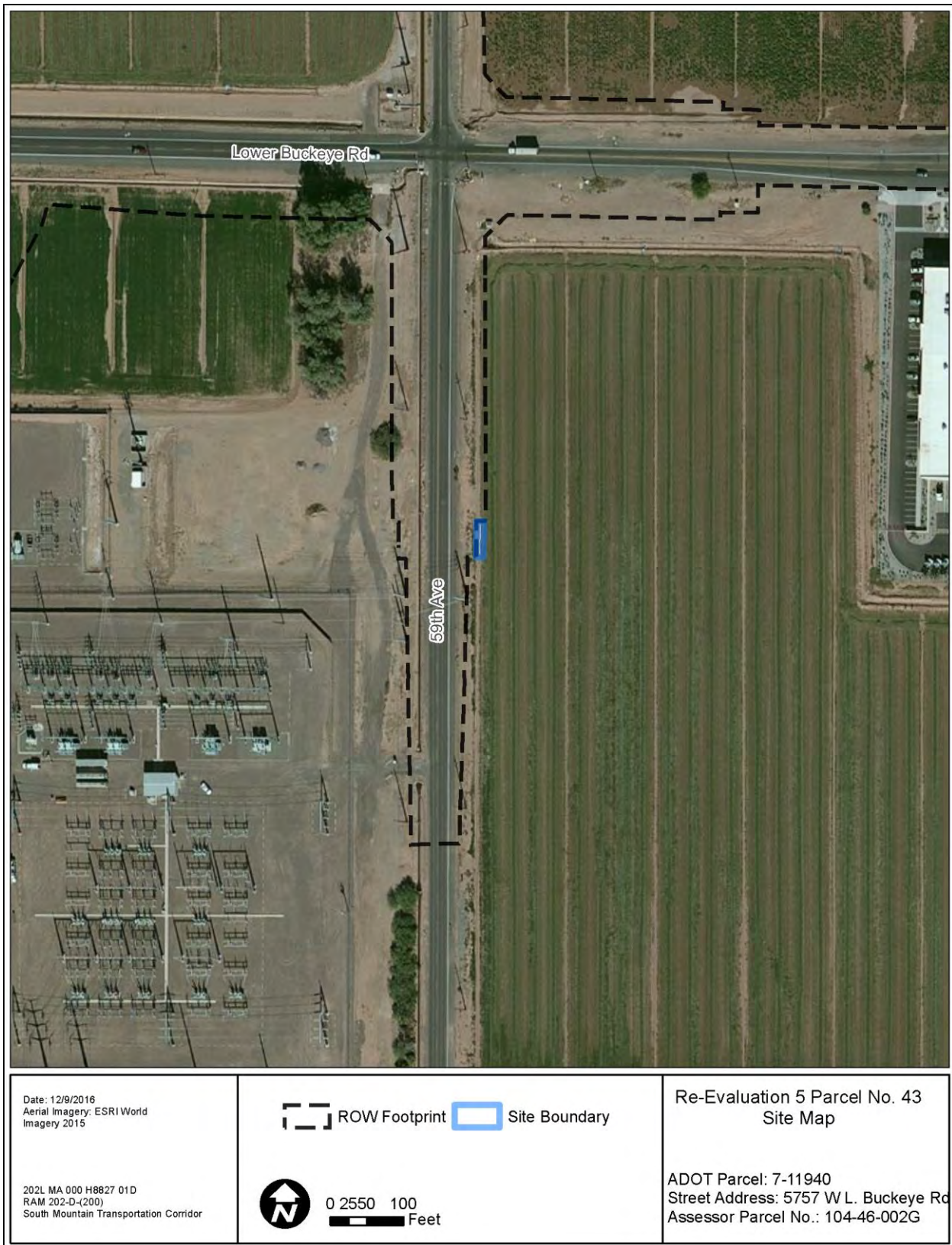
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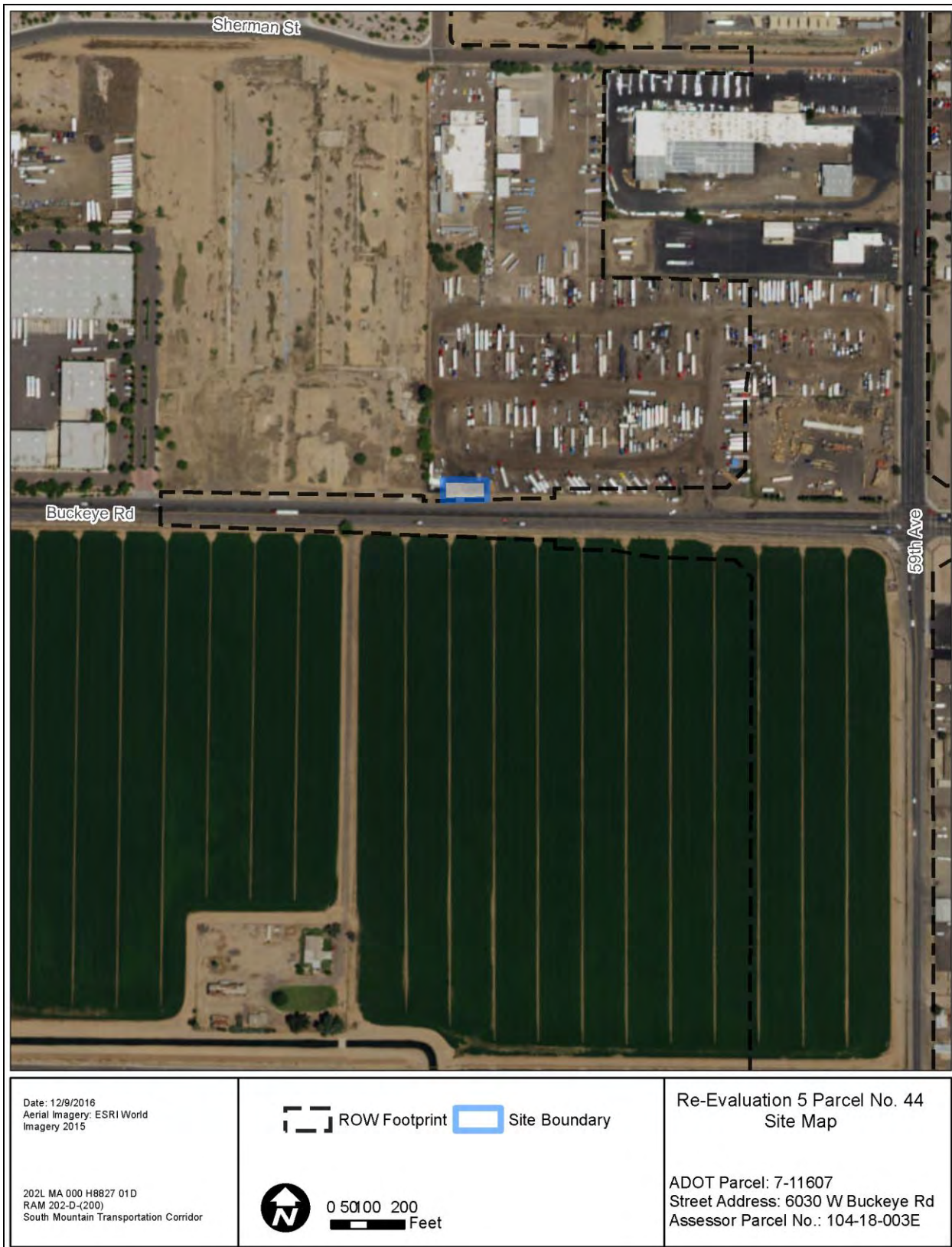
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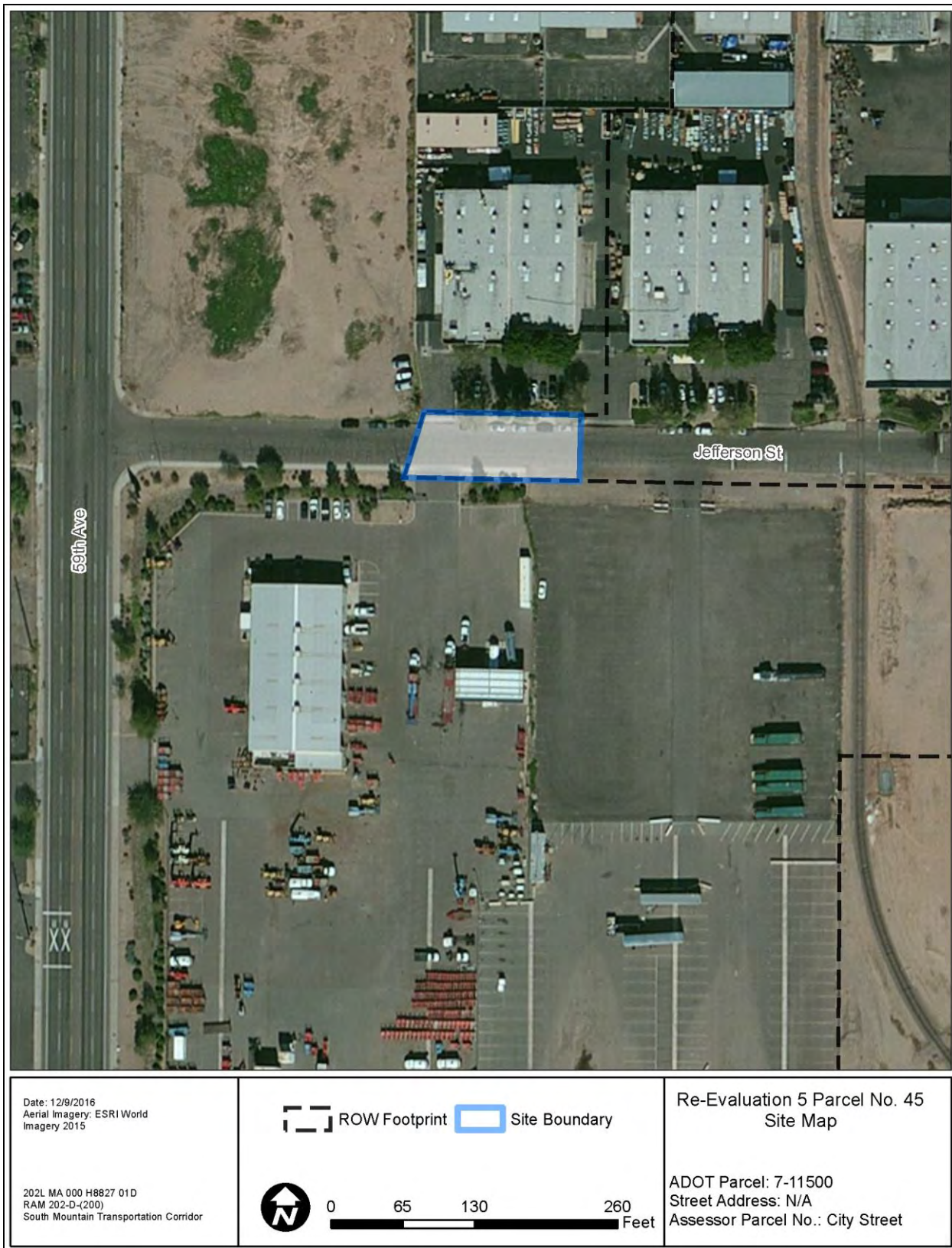
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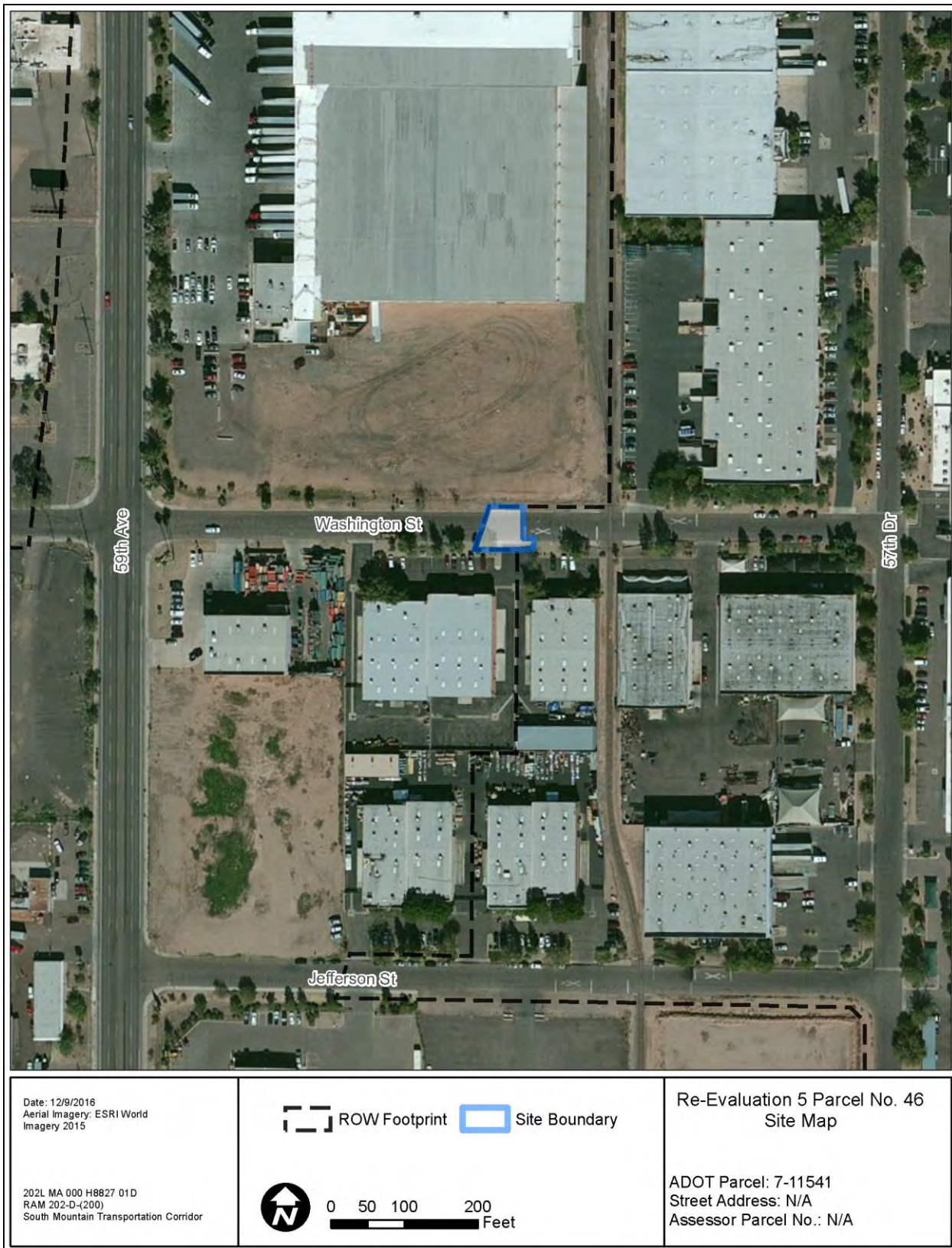
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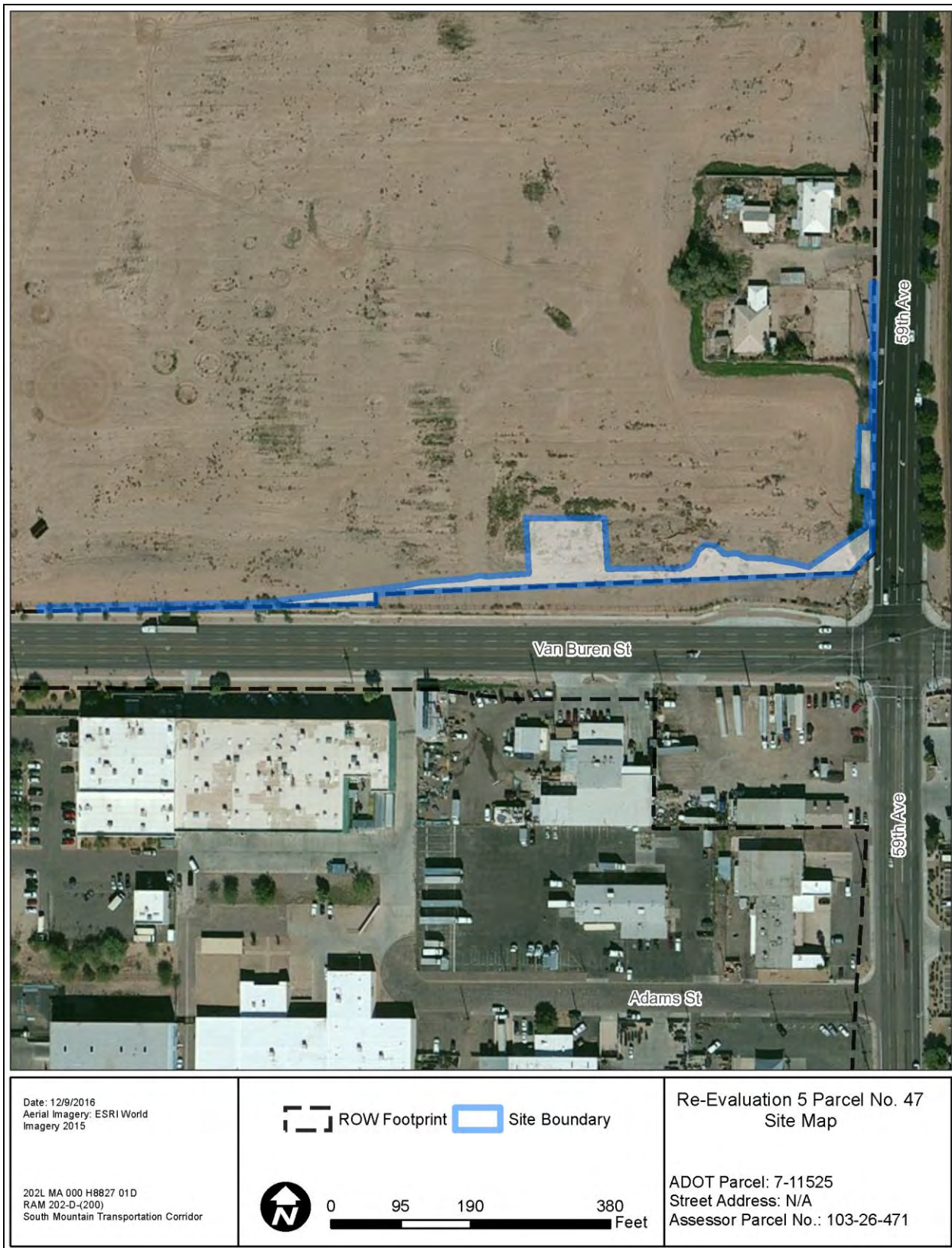
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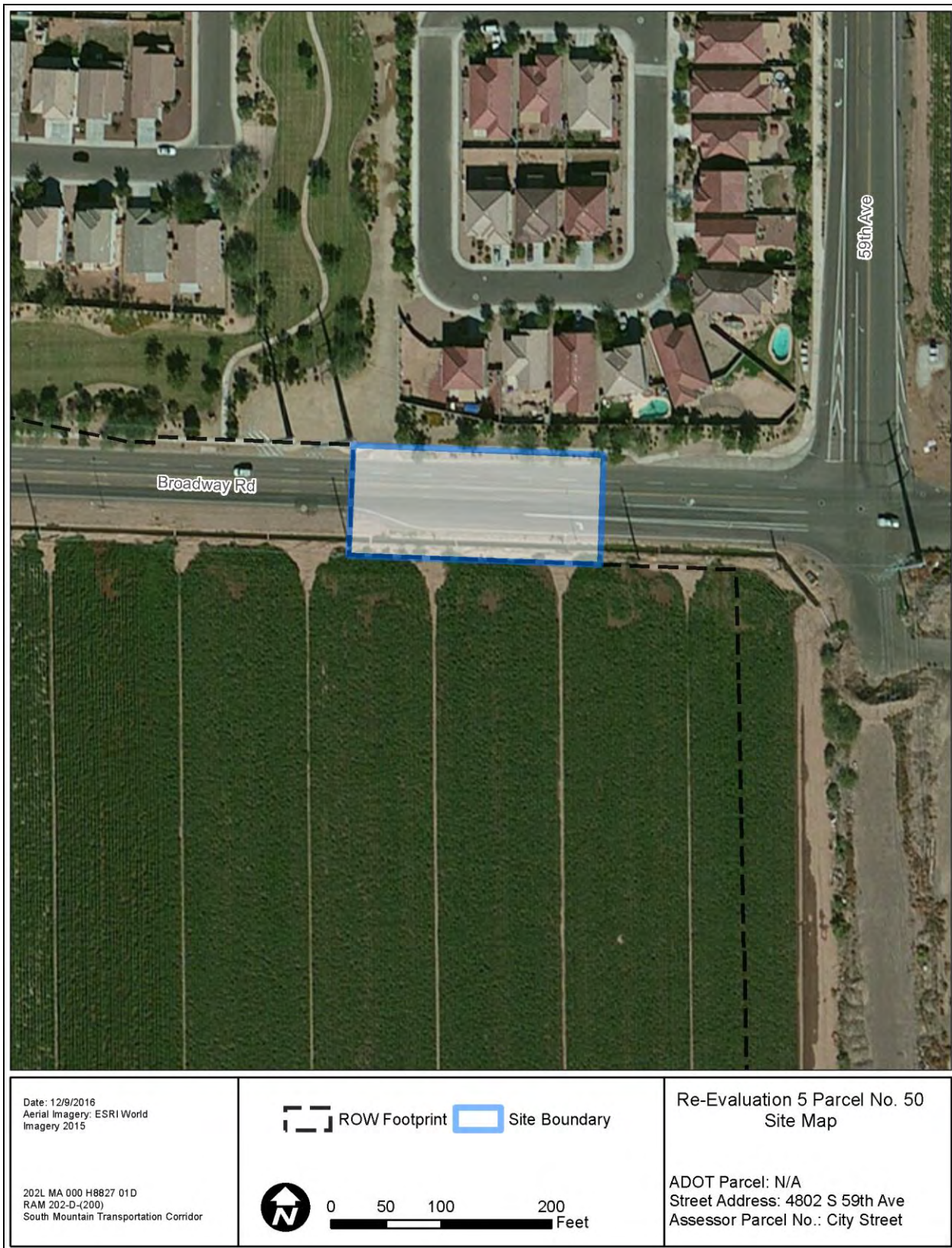
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FEIS/ROD Reevaluation #5 – Rev 2



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FEIS/ROD Reevaluation #5 – Rev 2



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FEIS/ROD Reevaluation #5 – Rev 2

Appendix-B Section 106 Consultation Summary

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Class III Survey Report: A Class III Cultural Resource Survey of 50 Parcels for the Loop 202–South Mountain Freeway Environmental Impact Statement Reevaluation, Maricopa County, Arizona (Bowler et al. 2017)				
Letters	Date Sent	Purpose of Consultation	Consulting Parties	Response
Agencies	February 13, 2017	<ul style="list-style-type: none"> • Adequacy of Class III report (Bowler et al. 2017) • Site management recommendation 	Arizona State Land Department	February 24, 2017, concurred
			Arizona State Museum	No response
			Bureau of Indian Affairs	March 1, 2017, concurred
			Bureau of Land Management	March 13, 2017, concurred
			Bureau of Reclamation	February 20, 2017, concurred
			City of Avondale	No response
			City of Chandler	No response
			City of Glendale	February 24, 2017, concurred
			City of Phoenix, Archaeology Section	March 1, 2017, concurred
			City of Phoenix, Historic Preservation Office	No response
			City of Tolleson	No response
			Flood Control District of Maricopa County	No response
			Maricopa County Department of Transportation	No response
			Roosevelt Irrigation District	No response
			Salt River Project	No response
			State Historic Preservation Office	February 15, 2017, concurred
			Western Area Power Administration	No response
			U.S. Army Corps of Engineers	No response

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Class III Survey Report: *A Class III Cultural Resource Survey of 50 Parcels for the Loop 202–South Mountain Freeway Environmental Impact Statement Reevaluation, Maricopa County, Arizona* (Bowler et al. 2017)

Letters	Date Sent	Purpose of Consultation	Consulting Parties	Response
Tribes	February 13, 2017	<ul style="list-style-type: none"> • Adequacy of Class III report (Bowler et al. 2017) • Site management recommendation 	Ak-Chin Indian Community	February 28, 2017, deferred to Gila River Indian Community
			Chemehuevi Tribe	No response
			Colorado River Indian Tribes	No response
			Fort McDowell Yavapai Nation	No response
			Fort Mojave Indian Tribe	No response
			Fort Yuma-Quechan Tribe	No response
			Gila River Indian Community	No response
			Havasupai Tribe	No response
			Hopi Tribe	February 21, 2017
			Hualapai Tribe	No response
			Kaibab Band of Paiute Indians	No response
			Navajo Nation	March 17, 2017. Noted that they had no concerns regarding the project via e-mail
			Pascua Yaqui Tribe	No response
			Pueblo of Zuni	No response
			Salt River Pima-Maricopa Indian Community	No response
			San Carlos Apache Tribe	No response
			San Juan Southern Paiute	No response
			Tohono O’odham Nation	No response
			Tonto Apache Tribe	No response
			Yavapai-Apache Nation	No response
			Yavapai-Prescott Indian Tribe	No response

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2

Appendix-C NRCS Exempt Letter

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #5 – Rev 2



5/18/17

Laura Paty
Landscape Architect, HDR
101 N. 1st Avenue, Suite 1950
Phoenix, AZ 85003

RE: #21 – South Mountain Freeway L202 to 303

File Code: 123-123

Dear: Laura Paty

The Natural Resources Conservation Service (NRCS) has general responsibility, nationwide, for implementing the Farmland Protection Policy Act (FPPA) and reviewing projects that may affect prime and unique important farmland and/or wetlands associated with agriculture.

After reviewing information you provided for Parcel 20170504, the following is noted:

- The proposed project is exempt from the requirements of the FPPA due to the lands status of already in or committed to urban development found under United States Code 4201 Subtitle C.
- No wetlands are found in the proposed project area.
- No further action is required at this time.

Should you have any questions, please contact D'andre Yancey, Arizona NRCS State Soil Scientist, at 602-280-8817 or via email at DAndre.Yancey@az.usda.gov.

Sincerely,

DANDRE YANCEY
State Soil Scientist

Enclosure(s)

Natural Resources Conservation Service
230 N. First Avenue, Suite 509, Phoenix, Arizona 85003-1733
Tel. (602) 280-8801 • Fax (602) 844-9178

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LOOP 202
South Mountain
Freeway

South Mountain Freeway FEIS/ROD Reevaluation #6

in Maricopa County, Arizona



Federal Highway Administration

ADOT

Arizona Department of Transportation

June 16, 2017

Federal-aid Project Number: NH-202-D(ADY)

ADOT Project Number: 202L MA 054 H8827 01C

Record of Decision

June 16, 2017

The Federal Highway Administration (FHWA), in coordination with the Arizona Department of Transportation (ADOT), reevaluated the South Mountain Freeway, Interstate 10 (I-10, Papago Freeway) to I-10 (Maricopa Freeway), Final Environmental Impact Statement and Record of Decision per 23 Code of Federal Regulations § 771.29 to address the clearance of two parcels of new temporary construction easement to be added to the project since the approval of the ROD on March 5, 2015. FHWA, with concurrence from ADOT, has determined that no substantial changes have occurred in social, economic, or environmental impacts of the proposed action that would substantially impact the quality of the human, socioeconomic, or natural environment. Therefore, the original environmental document remains valid for the proposed action. It is recommended that the project identified herein be advanced to the next phase of project development.

Robert Samour

Robert Samour, PE
Senior Deputy State Engineer
Arizona Department of Transportation

6/16/17

Date

Karla S. Petty

Karla S. Petty
Arizona Division Administrator
Federal Highway Administration

6/19/2017

Date

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

Table of Contents

List of Acronyms and Abbreviations.....	iii
1.0 Introduction and Project Description.....	1
1.1 Project Location.....	1
1.2 Approved Environmental Documentation	1
1.3 Previously Identified Impacts	3
1.4 Public and Agency Involvement	4
2.0 Description of Project Change.....	6
3.0 Environmental Consequences.....	8
3.1 Land Use	9
3.2 Water Resources	9
3.3 Floodplains	9
3.4 Waters of the United States	10
3.5 Topography, Geology, Soils	10
3.6 Biological Resources.....	10
3.7 Cultural Resources.....	11
3.8 Hazardous Materials.....	12
3.9 Visual Resources.....	12
3.10 Temporary Construction Impacts.....	13
4.0 New commitments related to New Parcel Acquisitions.....	13
5.0 Public/Agency Outreach.....	13
6.0 Conclusion and Recommendation.....	13
6.1 Conclusion	13
6.2 Recommendations.....	13

Figures

Figure 1. Overview Map	2
Figure 2. Detail Map	7

Table

Table 1. Environmental Consequences Assessment, Acquisition of New Parcels	8
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SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

List of Acronyms and Abbreviations

ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
BE	biological evaluation
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CAT	Citizens Advisory Team
CFR	Code of Federal Regulations
DEIS	Draft Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
HOV	high occupancy vehicle
I-10	Interstate 10
IBA	Important Bird Area
IPaC	Information, Planning, and Conservation
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
PA	programmatic agreement
ROD	Record of Decision
ROW	right-of-way
SB	southbound
SPCC	Spill Prevention Control and Countermeasure
TCE	temporary construction easement
TI	Traffic Interchange
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service
Western	Western Area Power Administration

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

1.0 Introduction and Project Description

The Federal Highway Administration (FHWA), in coordination with the Arizona Department of Transportation (ADOT), developed this reevaluation of the South Mountain Freeway, Interstate 10 (I-10, Papago Freeway) to I-10 (Maricopa Freeway), Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) per 23 Code of Federal Regulations (CFR) § 771.129 to address the construction of temporary access roads and crane pads that were identified since the approval of the ROD on March 5, 2015, and will be partially located outside the FEIS study limits. Additionally, there is a portion of the new southbound (SB) Salt River Bridge abutment embankment that will require the acquisition of new right-of-way (ROW) also located outside the FEIS study limits. The access roads and crane pads will be constructed in two temporary construction easement (TCE) parcels adjacent and parallel to the South Mountain Freeway ROW where the Salt River bridges will be constructed (Figure 1. Overview Map). The new ROW parcel is also within the reevaluation limits shown in Figure 1. The access roads and crane pads are required at this location because the ROW is too narrow to encompass both the required space for construction operations and the bridges. The new ROW parcel is required to construct the embankment for the SB bridge abutment that will protect the bridge from the erosive forces of water flowing in the Salt River. The land underlying the TCE parcels is part federal land managed by the Bureau of Land Management (BLM) and part land owned by a private party, Cemex Construction Materials South, LLC. After construction of the bridges is completed, the TCE parcels will expire and the unencumbered fee interest in the land will revert back to the BLM and the private landowner. The new ROW parcel will be acquired from Cemex Construction Materials South, LLC, and will be owned (fee title) by the State and permanently incorporated into the State Highway System ROW.

This reevaluation document provides an overview of the freeway project, describes the actions requiring the new ROW and TCE parcels, assesses the environmental consequences of those actions requiring the new ROW and TCE parcels, describes past and future public and agency outreach, and presents a conclusion related to the actions requiring the new ROW and TCE parcels for the freeway project.

1.1 Project Location

ADOT is the sponsor of the construction and operation of the South Mountain Freeway. The freeway will constitute a section of the Regional Freeway and Highway System, the Loop 202 (also referred to as State Route 202L). The project is in the southwestern portion of the Phoenix metropolitan area in Maricopa County, Arizona (refer to Figure 1. Overview Map). The approximately 22-mile-long freeway will be constructed as an eight-lane divided, access-controlled facility, with four travel lanes in each direction. Three lanes will be for general purpose use and one lane will be dedicated to high-occupancy vehicle use.

1.2 Approved Environmental Documentation

The approved environmental documentation completed by ADOT, the project sponsor, and FHWA, the lead federal agency, included:

- Draft Environmental Impact Statement (DEIS) signed on April 16, 2013, and released to the public on April 26, 2013.
- FEIS signed on September 18, 2014, and released to the public on September 26, 2014.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

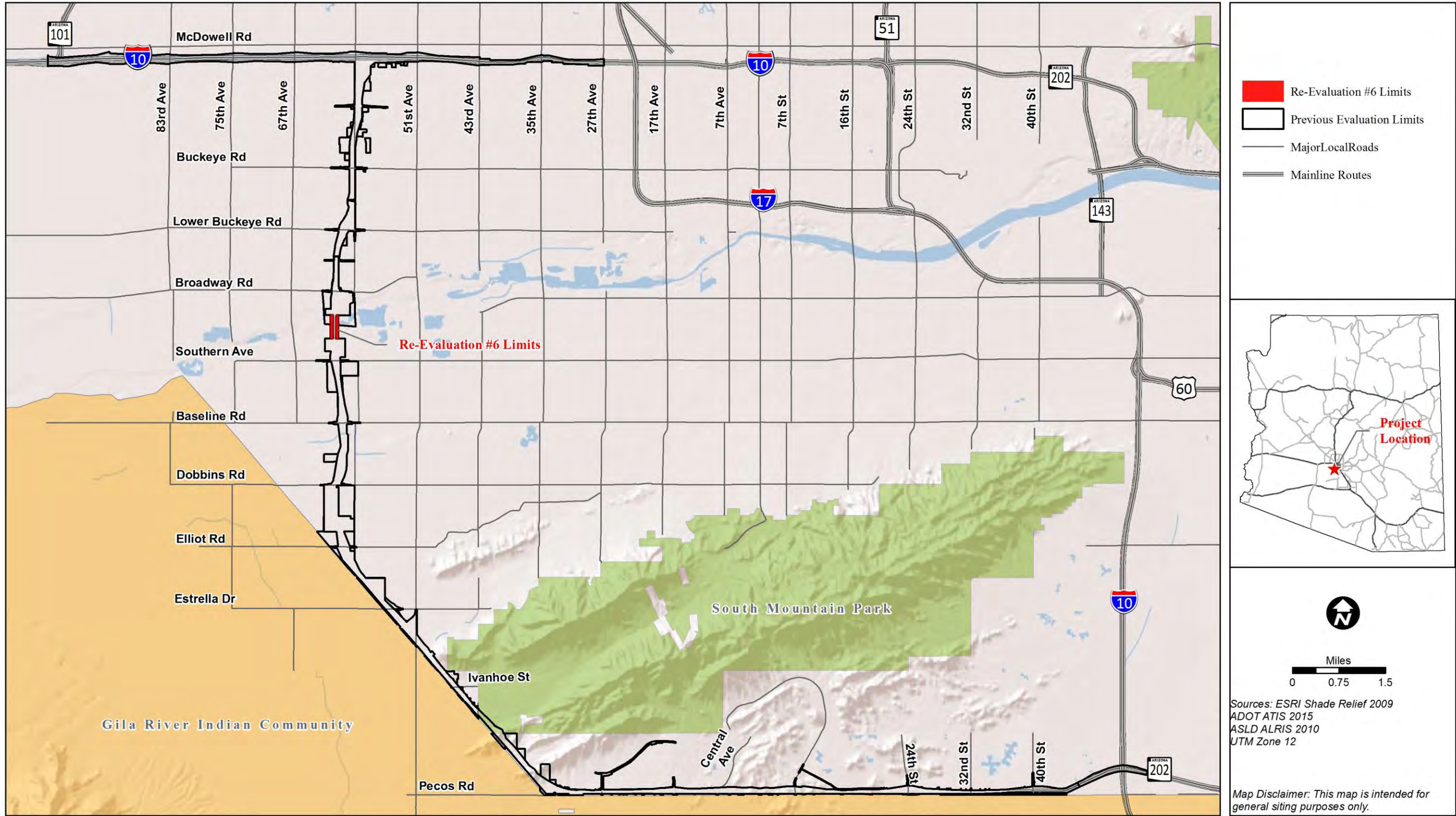


Figure 1. Overview Map

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

- Errata to the FEIS signed on November 19, 2014 and released to the public on November 28, 2014 (the Errata was published to address public comments on the DEIS that were inadvertently omitted from the FEIS).
- ROD signed on March 5, 2015, and released to the public on March 13, 2015.
- South Mountain Freeway FEIS/ROD Reevaluation (#1) signed February 19, 2016 addressed the addition of a local street connector and a pedestrian bridge.
- South Mountain Freeway FEIS/ROD Reevaluation (#2) signed June 20, 2016 addressed the addition of remainder parcels to the Project ROW.
- South Mountain Freeway FEIS/ROD Reevaluation (#3) signed August 10, 2016 addresses the addition of Chandler Boulevard: 27th Avenue to 19th Avenue.
- South Mountain Freeway FEIS/ROD Reevaluation (#4) signed March 17, 2017. This reevaluation is for changes from partial parcel acquisitions to entire parcel acquisitions between Vineyard Road and Lower Buckeye Road.
- South Mountain Freeway FEIS/ROD Reevaluation (#5) is being submitted for signature at the same time as this reevaluation. This reevaluation is for the acquisition of 50 parcels of easement and new ROW totaling 61.88 acres that have been identified during final design in locations where stormwater drainage facilities, utility relocations, changes to grading and slopes, changes to the location of ramps at the planned Estrella Drive Traffic Interchange (TI), modifications to the local road system, modifications to driveways and access points, and slight variations from the preliminary ROW plans to the final ROW boundary are necessary.

1.3 Previously Identified Impacts

The FEIS and ROD present a detailed description of anticipated impacts related to the Selected Alternative. Key elements are listed below. This reevaluation will cover impacts beyond those previously disclosed.

- The project will convert approximately 2,474 acres of land to a transportation use.
- The project is consistent with local and regional plans; however, it will introduce visual and noise intrusion adjacent to residential neighborhoods.
- Implementation of the project in the Western Section will result in adverse impacts on populations protected under Title VI and the environmental justice Executive Order; impacts will not, however, be disproportionately high or cause undue hardship when compared with such impacts on the general population.
- The project will result in the displacement of approximately 169 single-family homes, two apartment complexes with 680 total units, and 42 businesses.
- The City of Phoenix will experience an inconsequential reduction of annual property and sales tax revenue due to the conversion of land to a transportation use. Travel time savings for motorists in the region after completion of the project will be over \$200 million per year (in 2013 dollars).
- The project will not result in any exceedances of the health-based National Ambient Air Quality Standards.
- The project will require the placement of noise barriers in selected locations to reduce noise to levels that meet ADOT policy and FHWA regulations.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

- The project will affect up to 122 water wells and 94 acres of floodplains.
- The project will impact Waters of the United States and require appropriate permitting approvals from the US Army Corps of Engineers (USACE).
- The project will not affect any currently listed threatened and endangered species. However, the project will result in the conversion of cover, nesting areas, and food resources for wildlife provided by the natural plant communities found in the Study Area. The project will create a physical barrier that could, depending on design, decrease movement of wildlife to and from the South Mountains and Sierra Estrella. In response, multifunctional crossing locations have been identified to provide habitat connectivity under the freeway.
- The project will affect a number of National Register of Historic Places (NRHP)-eligible prehistoric and historic sites and the South Mountains Traditional Cultural Property.
- The project will convert 723 acres of prime and unique farmlands to a transportation use.
- The project will indirectly convert 177 acres of prime and unique farmlands to uses other than agriculture.
- The project will interact with five high-priority hazardous materials sites.
- Impacts on views from residential and rural uses include construction impacts, new traffic interchanges, and visibility of the new facility. Impacts will not change the low-to-moderate visual quality of views along the freeway.
- The project will provide benefits related to regional energy consumption.
- The project will result in the direct use of resources in the South Mountains afforded protection by Section 4(f) of the Department of Transportation Act of 1966. There is no feasible and prudent alternative that avoids use of the South Mountains.

1.4 Public and Agency Involvement

ADOT and FHWA undertook an extensive public and agency involvement program during the National Environmental Policy Act (NEPA) phase of the project. Key elements included:

- Publication of the Notice of Intent on April 20, 2001, in the Federal Register (66[77]:20345).
- Invitations sent in 2001 to USACE, U.S. Environmental Protection Agency (EPA), U.S. Bureau of Indian Affairs (BIA), and U.S. Fish and Wildlife Service (USFWS) to be cooperating agencies were issued. USACE and BIA agreed to be federal cooperating agencies. EPA and USFWS declined. In 2009, the Western Area Power Administration (Western) was invited, and agreed, to be a cooperating agency.
- Agency scoping letters were sent to 232 federal, State, and local agencies in October 2001. A 2-day agency scoping meeting was held later that month in Phoenix. Agencies were invited to participate in the project through monthly progress meetings during the project duration.
- Public scoping was initiated in November 2001 and included presentations at 23 neighborhood meetings and two public meetings.
- Between the public scoping kick-off through the release of the DEIS, over 200 presentations were made to neighborhood groups, homeowners' associations, chambers of commerce, village planning committees, trade associations, and other interested parties. Twelve public meetings were held.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

- ADOT created a Citizens Advisory Team (CAT) made up of groups and organizations in the Study Area. The CAT worked as a voluntary, advisory team to provide advice and input to ADOT and FHWA. Approximately 60 CAT meetings were held, each open to the public.
- The DEIS was released to the public on April 26, 2013, beginning the 90-day comment period (the minimum requirement under NEPA is 45 days). A public hearing was held May 21, 2013, at the Phoenix Convention Center from 10 a.m. to 8 p.m. Six community forums were held in Study Area communities to supplement the public hearing. Additionally, an online public hearing was created for those who could not attend a meeting in person.
- Approximately 900 people attended one of the public events, almost 1,900 unique visitors viewed information from the online hearing, and the project team received over 8,000 comments.
- The FEIS was released to the public on September 26, 2014. A 60-day review period was provided. As a result of the publication of the errata, ADOT and FHWA extended the review period to December 29, 2014. During the review period for the FEIS and errata, approximately 250 comments were received.
- ADOT and FHWA worked in close coordination with the Gila River Indian Community to hold a community forum on November 15, 2014, at the Boys & Girls Club, Gila River – Komatke. The Gila River Indian Community developed the agenda and facilitated the forum, which consisted of introductions, a description of the comment opportunities and court reporters' roles, an introduction to the South Mountain Freeway video flyover simulation, and an "open-microphone" comment period. Other than invited guests, the meeting was open to only Gila River Indian Community members. FHWA and ADOT project team members were guests at the forum and were in attendance to listen to comments. A translator was provided for those wishing to speak in the native O'odham language.
- An open house meeting on June 15, 2016, at Pecos Community Center, 17010 S. 48th St., Phoenix, was sponsored by State Representative Jill Norgaard in collaboration with State Representative Bob Robson, State Senator Jeff Dial, and City of Phoenix Councilman Sal DiCiccio. The purpose of the meeting was to provide a briefing on noise-abatement plans, traffic management and scheduling, bike paths, and aesthetics.
- A public open house meeting was held on August 24, 2016, at the Kings Ridge Preparatory Academy Cafeteria, 3650 S 64th Lane, Phoenix, to discuss the location and aesthetic treatment of the planned pedestrian bridge located between Broadway and Lower Buckeye Roads. Thirteen people attended the presentation and participated in a question and answer session.
- Three public meetings were held in 2016 to provide details and seek input on preliminary design plans, including information on the freeway's location, profile, interchange configurations and noise barrier locations, as well as initial concepts for landscaping and visual appearance:
 - September 27, 2016, at the Desert Vista High School, Multipurpose Room, 16440 S. 32nd St., Phoenix
 - September 28, 2016, at the Betty Fairfax High School, Multipurpose Room, 8225 S. 59th Ave., Laveen
 - October 6, 2016, at the Fowler Elementary School, Multipurpose Room, 6707 W. Van Buren St., Phoenix

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

Approximately 800 people participated in these meetings and the more than 660 comments, questions, emails and phone calls were collected by the Project team.

- A meeting for leaders from cities, regional agencies, schools, Title VI organizations, large employers, associations, and community public information officers was held December 20, 2016, at 411 N Roosevelt Ave, Chandler, to provide a 6-month construction look ahead for the period between January 2017 and July 2017.
- Since September 2016 outreach has included the following metrics:
 - 764 stakeholders have been engaged through attending a public meeting or contacting the Project team.
 - 305 inquiries from members of the public have been received.
 - 135 public parties were contacted by the Project team to complete questionnaires and surveys.
 - 6 construction alerts have been issued for specific activities.
 - 1 construction notice has been issued in both English and Spanish to provide a 6-month look ahead for the period between January 2017 and July 2017.
 - ADOT has issued media releases on average once per week since September 2016 to keep the public apprised of project updates.

2.0 Description of Project Change

The new ROW parcel measuring 0.44 acres and TCE parcels totaling 18.22 acres (Figure 2. Detail Map) are required for the construction of the Salt River bridges, a project element that was previously disclosed in the FEIS/ROD. The new ROW parcel was identified as necessary when refinements to the SB bridge embankment plans were made during final design, and it became apparent that the embankment could not be designed to fit within the originally proposed ROW limits. The new ROW parcel will be covered with earthen materials during construction and will remain so indefinitely after construction and for the life of the freeway. The new ROW parcel will be acquired from Cemex Construction Materials South, LLC, and will be owned (fee title) by the State and permanently incorporated into the State Highway System ROW.

After the construction contractor performed an analysis of the Salt River bridge construction plans, it was determined additional space beyond the permanent ROW in the form of TCE parcels would be needed for equipment access and the placement of cranes. Access roads and crane pads will require grading and the re-contouring of the existing topography in the Salt River channel. If necessary, the contractor will import materials, such as gravel and timber mats, to stabilize access roads and pads. When the bridges are complete, material imported into the river channel will be removed and wasted or recycled at other locations in the project, or disposed of offsite. When the imported materials are removed, the disturbed areas will be re-contoured to match the preconstruction topography and will undergo stabilization and revegetation, if warranted, as required by the Erosion-Sediment Control Plan, the Stormwater Pollution Prevent Plan, and the Landscape and Aesthetics Plan. The land underlying the TCE parcels is part federal land managed by the BLM and part land owned by Cemex Construction Materials South, LLC. Within the TCE areas, no permanent bridge or highway features will be constructed, and restoration will occur as outlined above. After construction of the

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

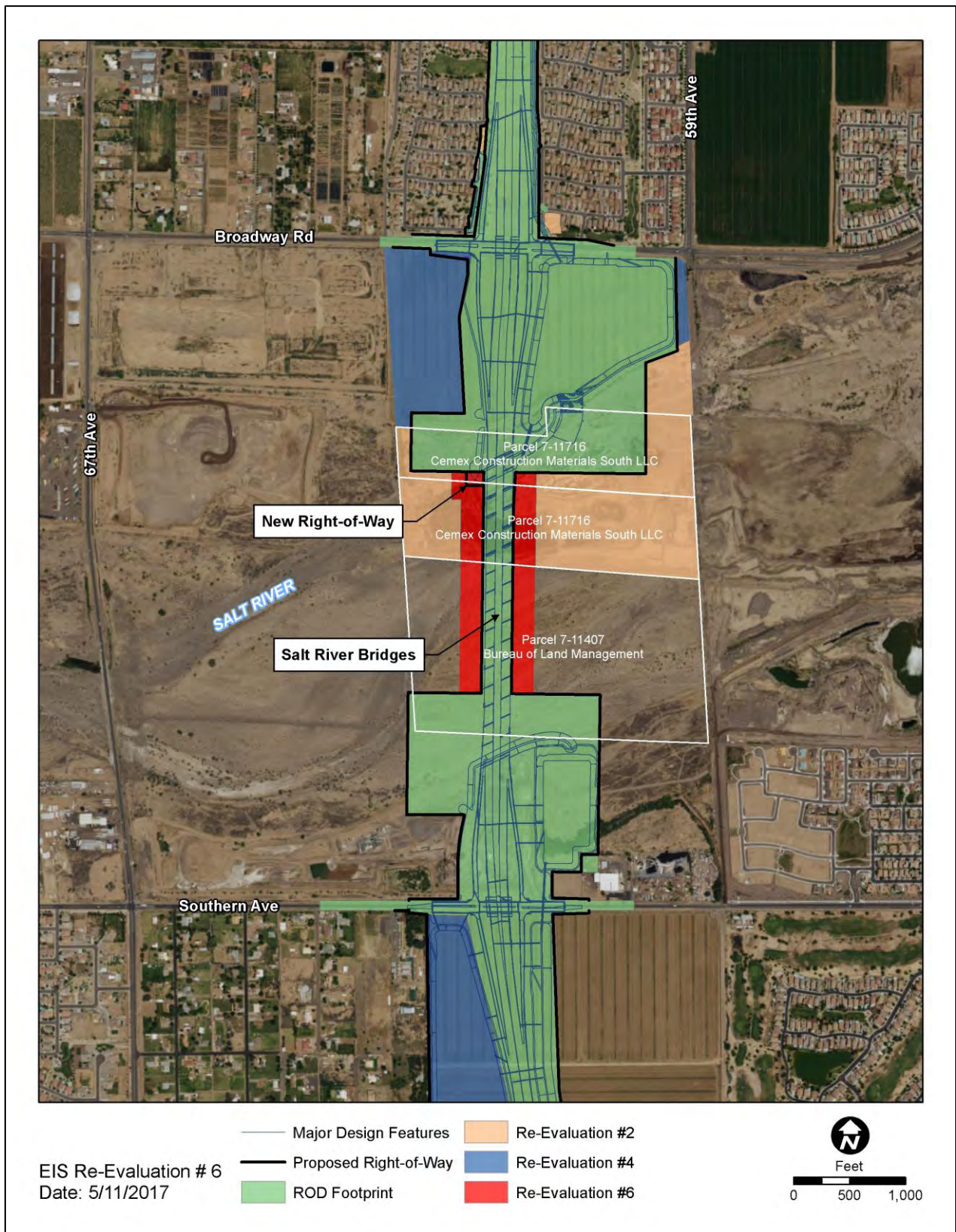


Figure 2. Detail Map

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

bridges is completed, the TCE parcels will expire and the unencumbered fee interest in the land will revert back to the BLM and Cemex Construction Materials South, LLC.

Some work within the new ROW and TCE will occur within waters of the US in the Salt River channel. These additional work activities have been included in the Clean Water Act individual permit application for the project that is undergoing USACE review and approval. However, all work within this new ROW and TCE that is also within waters of the US will only result in temporary impacts to waters of the US and is therefore not anticipated to require compensatory mitigation.

3.0 Environmental Consequences

This section presents an analysis of the environmental consequences at a corridor-wide level (Table 1) and then provides additional details for changes to the project occurring in new ROW and TCE parcels. All of the mitigation and commitments made in the FEIS and ROD for the project apply to the new parcels presented in this reevaluation. Resources with changes in environmental impacts are described in more detail following the table.

Table 1. Environmental Consequences Assessment, Acquisition of New Parcels					
Setting/Resource Circumstance	Change in Affected Environment		Change in Environmental Impact		Additional Discussion Included
	Yes	No	Yes	No	
Land Use	X			X	See discussion below
Social Conditions		X		X	
Environmental Justice and Title VI		X		X	
Displacements and Relocations		X		X	
Economics		X		X	
Air Quality		X		X	
Noise		X		X	
Water Resources	X			X	See discussion below
Floodplains	X		X		See discussion below
Waters of the United States	X		X		See discussion below
Topography, Geology, Soils	X			X	See discussion below
Biological Resources	X			X	See discussion below
Cultural Resources	X			X	See discussion below
Prime and Unique Farmland		X		X	
Hazardous Materials	X			X	See discussion below
Visual Resources	X			X	See discussion below
Energy		X		X	
Temporary Construction Impacts	X			X	See discussion below
Material Sources and Waste Material		X		X	
Secondary and Cumulative Impacts		X		X	
Section 4(f)/6(f)	X			X	

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

3.1 Land Use

An additional 0.44 acres of land will be permanently incorporated into the freeway for the construction of the SB Salt River Bridge and 18.22 acres of land will be temporarily occupied as construction easement and used for construction access and crane operations associated with bridge building. Both the new ROW and TCE parcels are located in the channel of the Salt River that is currently undeveloped but used for the conveyance of stormwater, treated wastewater, irrigation tail water, and controlled releases from the reservoirs of the Salt River Reclamation Project. The new ROW parcel will encompass a portion of embankment that will be constructed to protect the new bridge abutment and foundation. This embankment will be essentially the same as the natural river bank, but constructed in location that offers greater protect of the bridge from erosion. The changes to the embankment size and location that requires the additional 0.44 acres of land not originally anticipated in the FEIS/ROD will not produce a meaningful change in the river's current use as a water conveyance. Furthermore, the implementation of future changes such as the Rio Salado Oeste, a flood control and habitat restoration project cosponsored by the USACE that will take place in the riverbed, will not be affected because this is a small change and conceptual planning of the Rio Salado Oeste Project has already accounted for transportation crossings being present by the time it is implemented.

Occupation and use of the construction easements will be temporary and the land returned to its previous use when the project is complete. Therefore, activities within the TCE parcels will not represent a permanent change to land use or an increase in the overall project impacts to land use disclosed in the FEIS/ROD and previous reevaluations. Furthermore, because the TCE parcels will revert to their pre-construction state and no permanent bridge or highway features will be constructed in the TCE parcels, there will be no impacts to the implementation of planned changes such as the Rio Salado Oeste Project. No new mitigation measures are required to address land use impacts as a result of these project changes.

3.2 Water Resources

Construction of the embankment within the new ROW parcel and the activities in TCE parcels including temporary grading or earthwork to construct access roads or crane pads will be stabilized and/or best-management practices employed to prevent the release of sediment or other pollutants into the Salt River bed. Measures and best-management practices as described in the Arizona Department of Transportation *Erosion and Pollution Control Manual* and the project's Technical Provisions. No new mitigation measures are required for impacts on water resources as a result of these project changes.

3.3 Floodplains

The changes to the embankment requiring an additional 0.44 acres of new ROW represent small change to the floodplain topography. In accordance with the FEIS/ROD commitment FLD-1, the hydraulic analysis performed concluded that the bridge and associated embankment does not contribute to a rise in elevation of floodwaters. Because the activities confined to the TCE parcels are impermanent and restoration will take place after construction, any floodplain impacts would be temporary and reversed at the conclusion of the project. Therefore, no new mitigation measures are required.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

3.4 Waters of the United States

A preliminary jurisdictional delineation and individual permit application has been submitted to the USACE for the project. Potential impacts to Waters of the US within the Salt River channel have been reviewed specifically and are included in the current Individual Permit under review by the USACE. Because all additional activities will be temporary, no additional new permanent impacts will occur. Because the actions that will take place in the TCE parcels has not been permitted, ADOT will not grant contractor access to TCE parcels until authorization is received from the USACE. Similarly, until the Section 401 of the Clean Water Act requirements are satisfied with the Arizona Department of Environmental Quality, no contractor access will be granted.

3.5 Topography, Geology, Soils

The change to the embankment size and location that requires the additional 0.44 acres of land will not produce a meaningful change in topography as the river channel will largely remain in the same location as the pre-construction conditions. The embankment material will be comprised of stabilized materials found locally and will be similar to those found in the surrounding geological setting. Grading and earthwork in the new TCE parcels will be performed to construct access roads and crane pads resulting in changes to the topography of the Salt River bed. These features are only needed temporarily during construction and when the project is complete, the changes made to the topography of the river bed will be reversed and the contours restored to their original pre-construction condition. Because the impacts are either insubstantial or temporary and will be reversed, there are no additional or change to impacts that have been previously disclosed in the FEIS/ROD and previous reevaluations. No new mitigation measures are required for impacts on topography, geology, or soils as a result of these project changes.

3.6 Biological Resources

Construction-related activities in the new ROW and TCE parcels will impact habitats that are potentially suitable for federally-protected, state-protected, and tribal-special-status species previously analyzed in the Biological Evaluation (BE) (July 2014) and the ROD. With the exception of the 0.44 acre parcel of new ROW, the new parcels will be used temporarily and restored to their original pre-construction conditions when the project is complete. The permanent impacts resulting in loss of habitat will not increase meaningfully over the impacts disclosed in the FEIS/ROD and previous reevaluations. Furthermore, because the new parcels are not being acquired due to substantial changes in location, length, width, or configuration of the project, the impacts to wildlife connectivity and habitat fragmentation will not change compared to the impacts described in the FEIS/ROD.

Updated Arizona Game and Fish Department (AGFD) Online Environmental Review Tool results were obtained on February 15, 2017, to identify any new special status species or special areas documented within 3 miles of the project area since the July 2014 BE. The updated AGFD tool results were reviewed by a qualified biologist. The only new species or special areas identified were proposed critical habitat for the yellow-billed cuckoo and the Salt and Lower Gila Rivers Ecosystem Important Bird Area (IBA). The proposed critical habitat is located along the Salt River approximately 2.5 miles west of the project area; therefore, the project will have no effect to yellow-billed cuckoo proposed critical habitat. The Salt and Lower Gila Rivers Ecosystem IBA is also approximately 2.5 miles west of the project area; therefore, the project has no impact on the Salt and Lower Gila Rivers Ecosystem IBA.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

The July 2014 BE analyzed in detail two species protected by the federal Endangered Species Act (ESA); the Yuma clapper rail and Western yellow-billed cuckoo. The BE also analyzed in detail two species that were candidates for listing at the time; the Sonoran desert tortoise and Tucson shovel-nosed snake.

The two candidate species analyzed in the July 2014 BE (Sonoran desert tortoise and Tucson shovel-nosed snake) have been removed from the candidate list. Additional species status changes since the BE was completed include the roundtail chub being changed from candidate to proposed threatened, and the yellow-billed cuckoo being changed from proposed threatened to listed threatened. Habitat conditions in the project area have not changed substantially.

An updated US Fish and Wildlife Service (USFWS) Information, Planning, and Conservation (IPaC) system resource list was obtained on February 21, 2017 to identify any new ESA-protected species or habitat potentially occurring within the project area since the July 2014 BE. The updated IPaC resource list was reviewed by a qualified biologist and all ESA-protected species identified in the resource list were considered in the July 2014 BE. The updated IPaC resource list does not identify any proposed or designated critical habitat within or near the project area.

Due to the lack of suitable or critical habitat for ESA-protected species, the appropriate determination is still that the project will have no effect to any species or habitat protected by the federal ESA.

To prevent impacts to other protected species, the new ROW and TCE parcels will be subjected to pre-construction surveys in accordance with the project's Technical Provisions. Any wildlife encountered in harm's way will be relocated or transferred to a properly-licensed wildlife rehabilitator as necessary in accordance with applicable wildlife laws/regulations. No new mitigation measures are required for impacts on biological resources as a result of these project changes.

3.7 Cultural Resources

The programmatic agreement (PA) developed among FHWA, Arizona State Historic Preservation Office, and ADOT (executed July 21, 2015) regarding cultural resources for this project requires Section 106 consultation in instances when the project Area of Potential Effects expands beyond the original FEIS/ROD limits. Cultural resources surveys of the new ROW or TCE parcels is not required because the parcels are located in an active river bed where prehistoric and historic occupation is unlikely to have occurred, and any intact deposits of cultural materials is unlikely given the dynamic geomorphological setting with constantly shifting deposition and transportation of sediment.

In accordance with the programmatic agreement (PA) developed among FHWA, Arizona State Historic Preservation Office, and ADOT (executed July 21, 2015), Section 106 consultation has occurred with the following agencies listed on the next page as part of this reevaluation:

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

- Ak-Chin Indian Community
- Arizona State Land Department
- Arizona State Museum
- Army Corps of Engineers
- City of Avondale
- Bureau of Indian Affairs
- Bureau of Land Management
- City of Chandler
- Chemehuevi Tribe
- City of Phoenix Archaeology Section
- City of Phoenix Historic Preservation Office
- Colorado River Indian Tribes
- Flood Control District of Maricopa County
- Fort Mojave Indian Tribe
- Fort McDowell Yavapai Nation
- Forty Yuma Quechan Tribe
- City of Glendale
- Gila River Indian Community
- Havasupai Tribe
- Hopi Tribe
- Hualapai Tribe
-
- Kaibab Band of Paiute Indians
- Maricopa County Department of Transportation
- Navajo Nation
- Pascua Yaqui Tribe
- Bureau of Reclamation
- Roosevelt Irrigation District
- San Juan Southern Paiute
- State Historic Preservation Office
- Salt River Project
- Salt River Pima-Maricopa Indian Community
- Tonto Apache Tribe
- City of Tolleson
- Tohono O'odham Nation
- Western Area Power Administration
- Yavapai-Apache Nation

Pueblo of Zuni

Responding parties have concurred with the new ROW and TCE parcels (refer to Appendix-B Section 106 Consultation Summary).

3.8 Hazardous Materials

A Draft Initial Site Assessment for hazardous materials was completed in November 2012 and was updated in an addendum in June 2014 as part of the FEIS/ROD for the Project. To update the hazardous materials assessment for this reevaluation, Phase 1 investigations have been completed for the new ROW and TCE parcels. Should any hazardous materials concerns be identified during construction, they will be handled in accordance with the project's Technical Provisions.

3.9 Visual Resources

The small change in the location and size of the embankment requiring the new ROW parcel does not represent a noticeable change to the landscape compared to the impacts to visual resources disclosed in the FEIS/ROD. Similarly, the temporary grading and earthwork for access roads and crane pads within the new TCE parcels do not represent a material change in the project scope and will not introduce new or change impacts to the landscape character or viewsheds in the project area. Furthermore, the TCE parcels will be restored to their pre-construction condition once the project is complete leaving minimal visible evidence of the areas having been impacted. No new mitigation measures are required for impacts on visual resources as a result of these project changes.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

3.10 Temporary Construction Impacts

The new ROW and TCE parcels are located adjacent to the original ROW limits described in the FEIS/ROD and are therefore in areas where temporary construction impacts have already been disclosed. The previously disclosed impacts involving temporary construction noise and disruption to the pre-construction traffic patterns, for examples, will not be materially changed. No new mitigation measures are required for temporary construction impacts as a result of these project changes.

4.0 New commitments related to New Parcel Acquisitions

The commitments listed below will be implemented and tracked along with the commitments and mitigation measures presented in the ROD and incorporated as necessary into the contractual Technical Provisions for the Project.

- The contractor is only permitted to work within the portion of new easements or ROW that are not located within Waters of the US until such time that a Section 404 Permit and 401 Water Quality Certification are received.
- ADOT will notify the City of Phoenix, BLM, and USACE of the change in the area of impact specific to the TCE through the BLM parcel in the area of the future Rio Salado Oeste restoration project. ADOT will resolve any comments or concerns from the agencies prior to obtaining the TCE from BLM. The contractor is only permitted to work within the new TCE after such time that the TCE is obtained from BLM.

5.0 Public/Agency Outreach

Changes to the project related to the acquisition of new rights-of-ways and easements do not require an additional public hearing. Public outreach will continue in accordance with the project *Public Involvement Plan*.

6.0 Conclusion and Recommendation

6.1 Conclusion

A Supplemental FEIS is not warranted for the following reasons:

- The proposed modifications are limited in scope and impacts and are all within or adjacent to the ROW footprint analyzed in the FEIS/ROD.
- The Selected Alternative and its related impacts identified in the FEIS and ROD would not significantly change as a result of the modifications described herein.

6.2 Recommendations

FHWA, in coordination with ADOT, reevaluated the South Mountain Freeway, Interstate 10 (I- 10, Papago Freeway) to I-10 (Maricopa Freeway) FEIS and ROD per 23 CFR § 771.129. FHWA, with concurrence from ADOT, has determined that no substantial changes have occurred in the social, economic, or environmental impacts of the proposed action that would substantially impact the quality of the human, socioeconomic, or natural environment. Therefore, the original environmental document remains valid for the proposed action. It is recommended that the project identified herein be advanced to the next phase of project development.

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

Appendix-A Section 106 Consultation Summary

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

Continuing Section 106 Consultation				
Letters	Date Sent	Purpose of Consultation	Consulting Parties	Response
Agencies	March 15, 2017	<ul style="list-style-type: none"> TCE 	Arizona State Land Department	March 21, 2017, concurred
			Arizona State Museum	No response
			Bureau of Indian Affairs	March 27, 2017, concurred
			Bureau of Land Management	March 21, 2017, concurred
			Bureau of Reclamation	March 21, 2017, concurred
			City of Avondale	March 21, 2017, concurred
			City of Chandler	No response
			City of Glendale	March 15, 2017, concurred
			City of Phoenix, Archaeology Section	April 7, 2017, concurred
			City of Phoenix, Historic Preservation Office	April 24, 2017, concurred
			City of Tolleson	No response
			Flood Control District of Maricopa County	March 23, 2017, concurred
			Maricopa County Department of Transportation	No response
			Roosevelt Irrigation District	No response
			Salt River Project	No response
			State Historic Preservation Office	March 17, 2017, concurred
Tribes	March 15, 2017	<ul style="list-style-type: none"> TCE 	Western Area Power Administration	No response
			U.S. Army Corps of Engineers	No response
			Ak-Chin Indian Community	March 31, 2017, deferred to Salt River Pima-Maricopa Indian Community
			Chemehuevi Tribe	No response
			Colorado River Indian Tribes	No response
			Fort McDowell Yavapai Nation	No response
			Fort Mojave Indian Tribe	No response
			Fort Yuma-Quechan Tribe	No response

SOUTH MOUNTAIN FREEWAY PROJECT

FEIS/ROD Reevaluation #6 – Rev 0

Continuing Section 106 Consultation				
Letters	Date Sent	Purpose of Consultation	Consulting Parties	Response
			Gila River Indian Community	April 24, 2017, concurred. Reiterates that Gila River Indian Community identifies South Mountain as a Traditional Cultural Property as defined in Bulletin 38.
			Havasupai Tribe	No response
			Hopi Tribe	March 20, 2017, concurred
			Hualapai Tribe	No response
			Kaibab Band of Paiute Indians	No response
			Navajo Nation	No response
			Pascua Yaqui Tribe	No response
			Pueblo of Zuni	No response
			Salt River Pima-Maricopa Indian Community	No response
			San Carlos Apache Tribe	No response
			San Juan Southern Paiute	No response
			Tohono O'odham Nation	No response
			Tonto Apache Tribe	No response
			Yavapai-Apache Nation	No response
			Yavapai-Prescott Indian Tribe	No response

APPENDIX B
AIR QUALITY ANALYSIS

Arizona Department of Transportation

202 MA 054 H882701C

SR 202L (South Mountain Freeway)

I-10 (Maricopa Freeway) – I-10 (Papago Freeway)

Public Private Partnership (P3) Design-Build-Maintain Contract

General Air Quality Conformity Analysis

October 6, 2017

Submittal No. 3

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TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 GENERAL CONFORMITY RULE	1
3.0 PROJECT AREA FEDERAL ATTAINMENT STATUS.....	2
4.0 CONSTRUCTION EMISSION IN/OVER USACE GEOGRAPHIC JURISDICTION	3
5.0 CONCLUSIONS	4
REFERENCES	5

APPENDICES

A. Impacts to Waters of the US Maps.....	A1-A22
B. MOVES2014a Generated Emission factors from Construction Equipment.....	B1-B90
C. Construction Pollutants Emissions in the Geographic Jurisdiction.....	C1-C14

1.0 INTRODUCTION

The Arizona Department of Transportation (ADOT), in cooperation with the Federal Highway Administration and Connect 202 Partners, is proposing to construct the South Mountain Freeway (SMF) which will complete the State Route (SR) Loop 202 (202L) from I-10 (Maricopa Freeway) to I-10 (Papago Freeway). The proposed freeway would extend a distance of approximately 22 miles in the southwestern quadrant of the Phoenix metropolitan area, beginning at its eastern terminus with the existing traffic interchange between I-10 (Maricopa Freeway) and SR 202L (Santan Freeway) and extending westward on the Pecos Road alignment for approximately 8 miles. The proposed freeway alignment would then head northwest for approximately 5 miles, turn north near the Elliot Road and 59th Avenue intersection, continue for approximately 9 miles crossing the Salt River, and reach its western terminus with I-10 (Papago Freeway) near 59th Avenue.

As part of the process of an application for a Department of the Army Section 404 Individual Permit for the proposed South Mountain Freeway project, the U.S. Army Corps of Engineers (USACE) wanted to ensure that the anticipated emissions resulting from all construction activities in and over/under their geographic jurisdiction (i.e., waters of the US) would be below the applicable de minimis rates. The purpose of this analysis is to demonstrate and document that the total emissions resulting from construction activities in and over/under their USACE geographic jurisdiction for the South Mountain Freeway project are below the applicable general conformity de minimis emission rates. This would make the South Mountain Freeway project exempt from a general conformity determination and it would be presumed to conform to the applicable State Implementation Plan.

2.0 GENERAL CONFORMITY RULE

On November 30, 1993, the U.S. Environmental Protection Agency (EPA) promulgated a set of regulations, known as the General Conformity Rule. On April 5, 2010, EPA promulgated revised general conformity requirements at 40 C.F.R. Part 93 Subpart B (75 FR 17254), which became effective on July 6, 2010. In the same action, EPA eliminated most of the general conformity requirements under 40 C.F.R. Part 51 Subpart W, because they were mostly duplicative of the requirements at 40 C.F.R. Part 93 Subpart B, and revised 40 C.F.R. § 51.851 to remove the obligation for states to include general conformity requirements in their implementation plans.

The general conformity regulations apply to a federal action in a nonattainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutants caused by the federal action equal or exceed certain de minimis rates, thus requiring the federal agency to make a determination of general conformity. By requiring an analysis of direct and indirect emissions, EPA intended the regulating federal agency to make sure that only those emissions that are reasonably foreseeable and that the federal agency can practicably control subject to that agency's continuing program responsibility will be addressed.

The general conformity regulations incorporate a stepwise process, beginning with an applicability analysis, in which the federal agency determines that the action is either exempt from General Conformity Rule requirements, is on its list of presumed to conform actions (note that the USACE does not have such a list of presumed to conform actions), or is subject to a formal conformity determination. SIP conformance can be demonstrated by showing that federal action's emissions would be less than applicable de minimis rates specified in 40 C.F.R. Section 93.153(b). These rates vary depending on the federal attainment designation for each pollutant.

Each federal agency is responsible for determining conformity of those proposed actions over which it has jurisdiction. An applicability analysis or, if required, general conformity determinations only needs to focus on those activities (i.e., their emissions) included in the federal action for the project. In accordance with applicable general conformity regulations and guidance, including USACE guidance dated April 20, 1994 (USACE 1994), when a general conformity determination is necessary, the USACE is only required to conduct a general conformity evaluation for a specific federal action associated with the selected alternative for a project or program (EPA 1993), and the USACE must issue a positive conformity determination before the federal action is approved.

3.0 PROJECT AREA FEDERAL ATTAINMENT STATUS

The South Mountain Freeway project area is located within the Phoenix metropolitan area. As shown in Table 1, the EPA classified the Phoenix metropolitan area as a federal nonattainment areas for Particulate Matter (PM₁₀) and ozone (O₃) and maintenance area for carbon monoxide (CO). All other pollutants are in attainment. It should be noted that because O₃ is a secondary pollutant (i.e., it is not emitted directly into the atmosphere, but is formed in the atmosphere from the photochemical reactions of volatile organic compounds (VOC), and oxides of nitrogen (NO_x) in the presence of sunlight), its de minimis emission rate is based on primary emissions of its precursor pollutants – VOC and NO_x. If the net emissions of either VOC or NO_x exceed the de minimis emission rate for O₃ (EPA 1993), then the federal action is subject to a general conformity determination for O₃.

Table 1. Project Area Federal Attainment Status

Pollutant	Federal Attainment Status
Carbon Monoxide (CO)	Maintenance
Particulate Matter (PM ₁₀)	Nonattainment
Ozone (O ₃)	Nonattainment

Source: EPA. Green Book Non-attainment Areas (<https://www.epa.gov/green-book>), last updated June 20, 2017

As a result of the attainment status shown in Table 1, the applicable de minimis rates for the general conformity applicability analysis are shown in Table 2.

Table 2. Applicable General Conformity Rates

Pollutant	De Minimis Emission Rate (tons/year)
Carbon Monoxide (CO)	100
Particulate Matter (PM10)	70 (Serious NAA's)
Volatile Organic Compounds (VOC)	100
Nitrogen Oxides (NOx)	100

Source: 40 CFR Part 93 Subpart B (Section 93.153(b))

VOC and NOx are precursors of Ozone

4.0 CONSTRUCTION EMISSION IN/OVER USACE GEOGRAPHIC JURISDICTION

A total of 49 waters of the US would be impacted by the South Mountain Freeway construction. A list of the impacted waters of the US and proposed drainage work are included in the Engineering 4345 Form as part of the Clean Water Act Section 404 Permit Application. Appendix A depicts the location of each impacted waters of the US.

EPA's Motor Vehicle Emission Simulator (MOVES) is a state-of-the-science emission modeling system that estimates emissions for mobile sources at the national, county, and project level for criteria air pollutants, greenhouse gases, and air toxics. The latest version MOVES2014a incorporates the NONROAD2008 module and was used to generate emission factors from the construction equipment for this project. National default data were used in the MOVES2014a model to be consistent with the input data for the NONROAD model by the Maricopa Association of Governments (MAG). These national default inputs included meteorology data, fuel supply data, and fuel formulation data. The generated emission factors from related construction equipment are shown in Appendix B.

Table 3 summarizes the calculated annual emissions by pollutants associated with the construction activity within the waters of the US. The number of equipment and construction schedule/timing used in the emission calculations were obtained from the Connect 202 Partners equipment manager. Appendix C shows detailed assumptions used in the emission calculations. Construction emissions of CO, PM10 exhaust, PM10 fugitive dust, VOC, and NOx are the emphasis of this analysis.

The following assumptions were used to model and calculate worst-case emissions:

- The current construction schedule shows that the constructions in the waters of the US would span from late 2017 to 2019. For calculation screening purposes, all construction activities are assumed to occur in 2018 because the construction schedule is still floating due to the uncertainty of the 404 Permit date of approval/issuance. If total emissions in the assumed year of 2018 are less than the de minimis rates, the emissions per year would be even less if the construction schedule spans into two or three years.
- Emission factors generated are slightly different in each month. The maximum monthly emission factors were used throughout the analyzed year.
- The Salt River and LACC have larger waters of the US footprints and a greater number of equipment and longer construction length would be needed to work on these two

jurisdictions. The remaining 47 small waters of the US have smaller footprints. It is assumed that the number of equipment and construction length used for the remaining 47 small waters of the US are identical.

Table 3. Pollutants Emissions (tons/year)

	CO	PM10 Exhaust	PM10 Fugitive	PM10 Total (F+E)	NOx	VOC
47 small waters of the US	5.60	0.67	1.63	2.30	20.15	2.23
LACC	0.18	0.02	0.34	0.36	0.59	0.07
Salt River	1.43	0.18	15.57	15.75	4.40	0.48
Total	7.21	0.88	17.54	18.42	25.14	2.78
De Minimis Rate	100	70	70	70	100	100
Equal/Exceeds	No	No	No	No	No	No

5.0 CONCLUSIONS

Construction emissions for the South Mountain Freeway project's activities in/over jurisdictional waters of the US have been analyzed using the EPA's latest model MOVES2014a. This analysis was performed in accordance with all applicable federal laws and regulations.

As demonstrated above, construction emissions from CO, PM10 exhaust, PM10 fugitive dust, NOx, and VOC have been shown below the applicable General Conformity de minimis rates under worst-case scenario in the year 2018, and therefore, the South Mountain Freeway project would not be subject to a USACE general conformity determination, and SIP conformance is presumed.

REFERENCES

Code of Federal Regulations, Title 40 – Protection of the Environmental, Subchapter C – Air Programs, Part 93 – Determining Conformity of Federal Actions to State or Federal Implementation Plans.

U.S. Army Corps of Engineers (USACE), Memorandum For All Major Subordinate Commanders, and District Commanders, Subject: EPA's Clean Air Act (CAA) General Conformity Rule, from Lester Edelman, Chief Counsel, USACE (CECC-E), April 20, 1994.

U.S. Environmental Protection Agency, Determining Conformity of General Federal Actions to State and Federal Implementation Plans – Final Rule, published in the Federal Register on November 30, 1993.

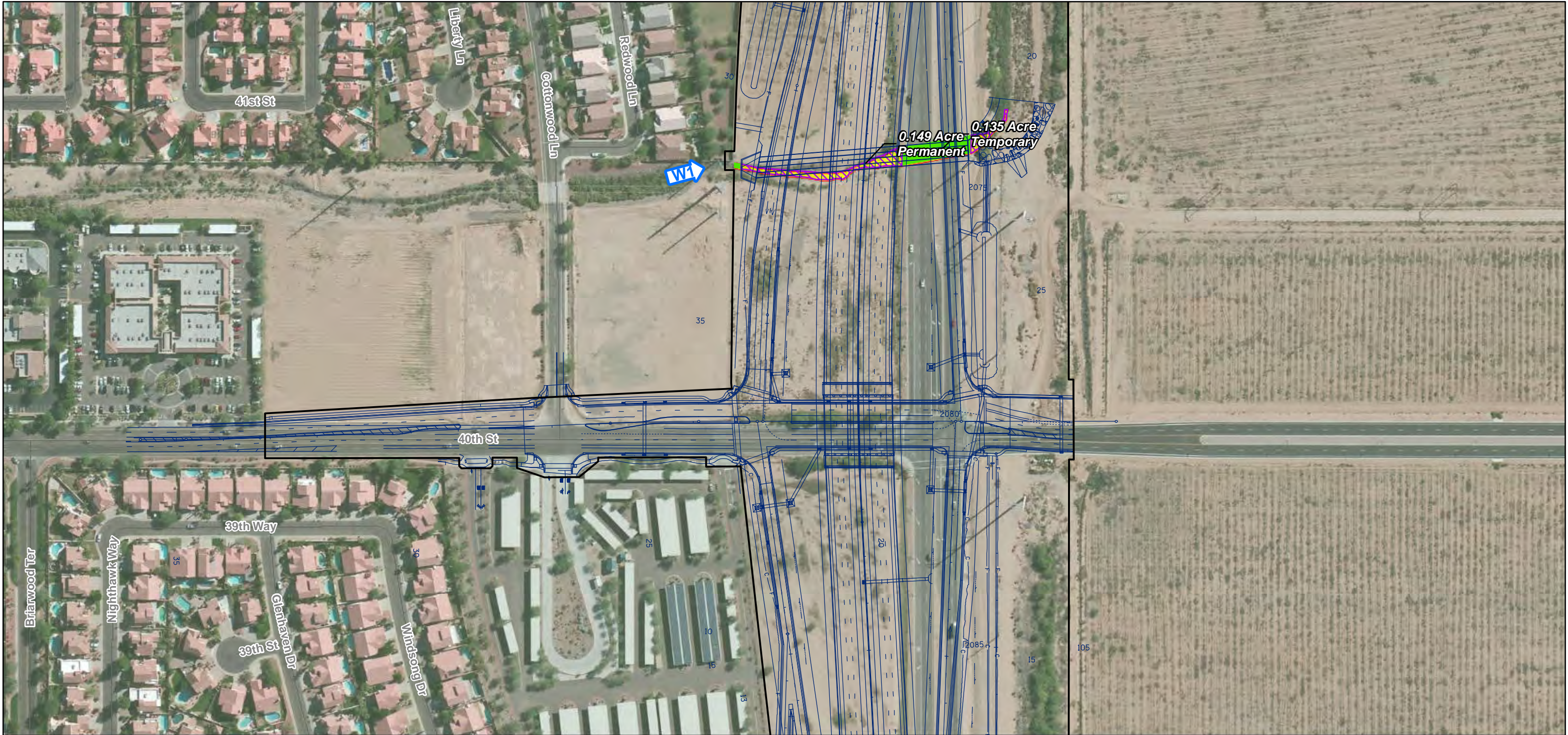
U.S. Environmental Protection Agency, Green Book Non-attainment Areas (<https://www.epa.gov/green-book>), last updated June 20, 2017.

U.S. Environmental Protection Agency, MOVES2014a (<https://www.epa.gov/moves/moves2014a-latest-version-motor-vehicle-emission-simulator-moves>)

APPENDIX A

Impacts to Waters of the US Maps

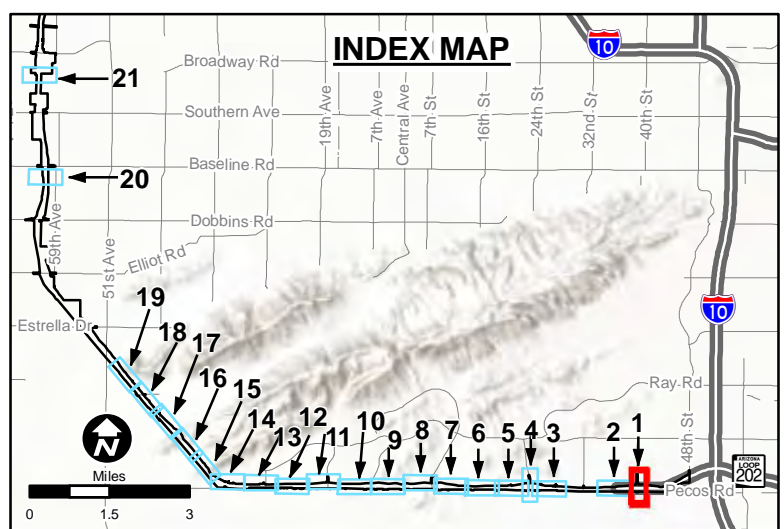
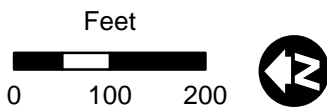
Waters of the US ID	Station	Waters of the US Acreage within Construction Footprint	Existing Drainage Structure	Proposed Drainage Structure
Wash 1 (W1)	2074+54	0.284	4-10'x7'x149' CBC	4-10'x5'x449' RCBC
Constructed Channel 1 (C1)	2107+82	0.265	3-8'x4'x121' CBC	4-10'x4'x215' RCBC
Constructed Channel 3 (C3)	2158+22	0.274	6-10'x5'x133' CBC	6-10'x5'x215' RCBC
Constructed Channel 4 (C4)	2190+41	0.816	3-81"x59"x120' CMPA	49'x1,438' CC; 3-10'x6'x37' RCBC; 3-10'x6'x236' RCBC
Wash 2 (W2)	2219+35	0.415	2-87"x63"x120' CMPA	52'x564' CC; 18"x44' CHDPEPP; 2-10'x5'x232' RCBC;
Constructed Channel 5 (C5)	2244+59	0.176	2-81"x59"x164' CMPA	3-72"x253' RCP
Wash 3 (W3)	2275+70	0.948	3-96"x138' CMP	2-12'x8'x518' RCBC
Wash 4 (W4)	2304+08	0.154	1-78"x214' CMP	1-8'x6'x372' RCBC
Wash 5 (W5)	2330+07	0.231	2-78"x170' CSP	2-72"x330' CMP (Small Animal Crossing)
Constructed Channel 6 (C6)	2349+35	0.178	5-90"x196' CMP	4-10'x7'x222' RCBC
Wash 43 (W43)	2395+80	0.058	3-24"x136' CMP	2-36"x361' RCP
Truncated Wash West (T2)	2397+33	0.047	1-18"x153' CMP	1-24"x321' RCP
Wash 44 (W44)	2402+16	0.058	1-18"x142' RCP	1-30"x280' RCP
Wash 6 (W6)	2406+00	0.091	N/A	20'x363' CC
Wash 7 (W7)	2411+06	0.125	1-8'x4'x145' CBC	1-10'x6'x320' RCBC
Wash 8 (W8)	2412+62	0.102	1-8'x4'x141' RCBC	1-10'x6'x243' RCBC (Small Animal Crossing)
Wash 9 (W9)	2418+08	0.079	1-8'x4'x136' CBC	1-10'x5'x254' RCBC
Wash 10 (W10)	2425+20	0.202	1-8'x4'x167' CBC	1-6'x6'x286' RCBC
Wash 11 (W11)	2431+36	0.045	1-24"x165' RCP	1-10'x6'x246' RCBC
Wash 12 (W12)	2438+10	0.073	2-24"x154' RCP	2-8'x5'x230' RCBC
Wash 13 (W13)	2447+19	0.079	2-36"x159' RCP	4-8'x5'x207' RCBC
Constructed Channel 7 (C7)	2474+27	0.201	4-6'x5'x16' RCBC	1-18"x124' RCP; 3-10'x5'x240' RCBC
Wash 17 (W17)	2494+70	0.173	N/A	148'x167' Bridge (multi-use crossing)
Wash 18 (W18)	2504+38	0.065	N/A	1-48"x282' CMP
Wash 19 (W19)	2520+54	0.063	N/A	2-48"x192' CMP
Wash 20 (W20)	2521+85	0.053	N/A	1-48"x198' CHDPEPP
Wash 21 (W21)	2530+41	0.045	N/A	1-48"x220' CHDPEPP
Wash 22 (W22)	2533+61	0.291	N/A	2-10'x6'x241' RCBC
Wash 23 (W23)	2536+50	0.201	N/A	145'x147'L Bridge (multi-use crossing)
Wash 24 (W24)	N/A	0.021	N/A	N/A
Wash 25 (W25)	2543+28	0.062	N/A	1-36"x337' CMP
Wash 26 (W26)	2547+91	0.078	N/A	1-10'x4'x355' RCBC
Wash 28 (W28)	2566+00	0.17	N/A	145'x157' Bridge (multi-use crossing)
Wash 29A (W29A)	2569+63	0.093	N/A	18'x140' GD
Wash 29 (W29)	2571+44	0.187	N/A	1-10'x4'x215' RCBC
Wash 30 (W30)	2577+96	0.079	N/A	1-36"x243' CHDPEPP
Wash 31 (W31)	2582+12	0.156	N/A	5-54"x200' CMP
Wash 32 (W32)	2585+51	0.07	N/A	2-10'x4'x226' RCBC
Wash 33 (W33)	2595+22	0.059	N/A	2-72"x180' CMP
Wash 34 (W34)	2600+08	0.067	N/A	4-30"x48' CMPA; 1-10'x4'x190' RCBC
Wash 35 (W35)	2604+15	0.091	N/A	1-10'x4'x204' RCBC
Wash 36 (W36)	2611+48	0.102	N/A	2-10'x5'x192' RCBC
Wash 37 (W37)	2616+37	0.215	N/A	5-72"x284' CMP
Wash 38 (W38)	2620+78	0.064	N/A	1-36"x250' CHDPEPP
Wash 39 (W39)	2624+51	0.061	N/A	1-36"x261' CHDPEPP
Wash 40 (W40)	2956+17	0.045	N/A	1-36"x332' CHDPEPP
Wash 41 (W41)	2959+00	0.101	N/A	145'x134' Bridge (multi-use crossing)
Laveen Conveyance (LC)	3130+73	0.788	N/A	4-12'x16'x320' RCBC
Salt River Mine Pit (SRMP)	3225+00	8.979	N/A	85'x2,660' Bridges (2)

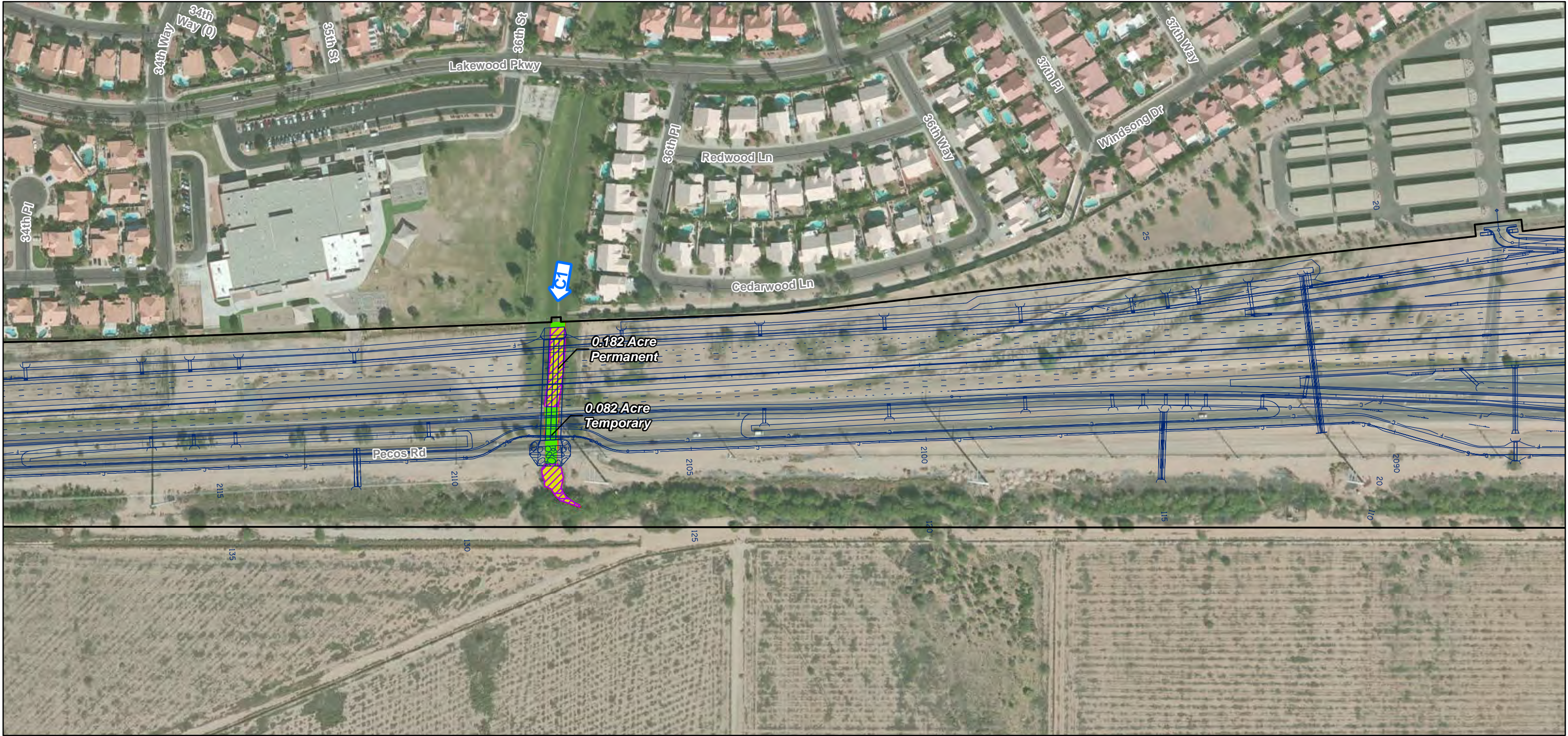


Sources: AZTEC (2017), HDR (2014). ESRI World Imagery (Aerial Photo Date: 5/29/2015)

ALTERNATIVE C - CONNECT 202 PARTNERS DESIGN
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Corps File Number: SPL-2002-00055
ADOT Project Number: 202 MA 054 H8827 01C
Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 1 of 21

- Design Files (8/30/2017)
- Project Limits
- Waters of the US
- Permanent Impacts
- Temporary Impacts
- Watercourse Number
Arrow Indicates Flow Direction

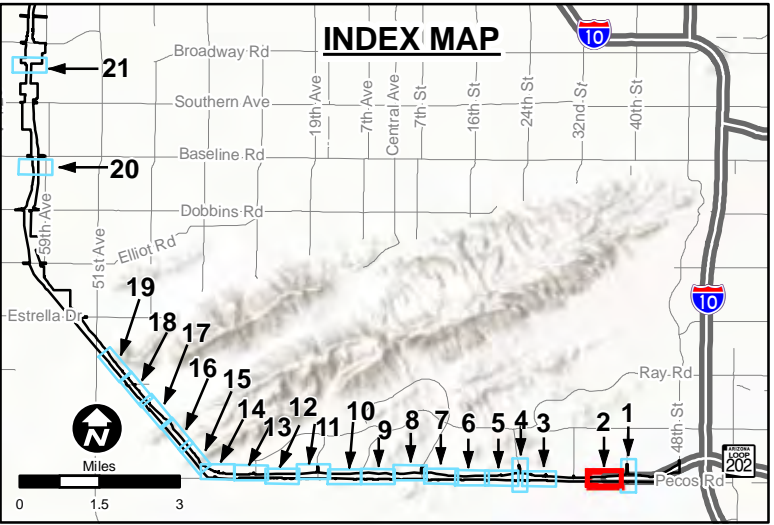




Sources: AZTEC (2017), HDR (2014). ESRI World Imagery (Aerial Photo Date: 5/29/2015)

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Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 2 of 21

- Design Files (8/30/2017)
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- Permanent Impacts
- Temporary Impacts
- Watercourse Number
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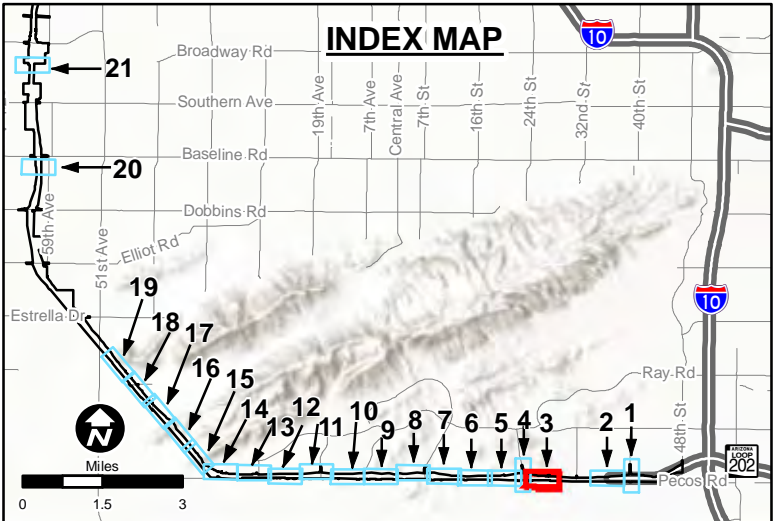


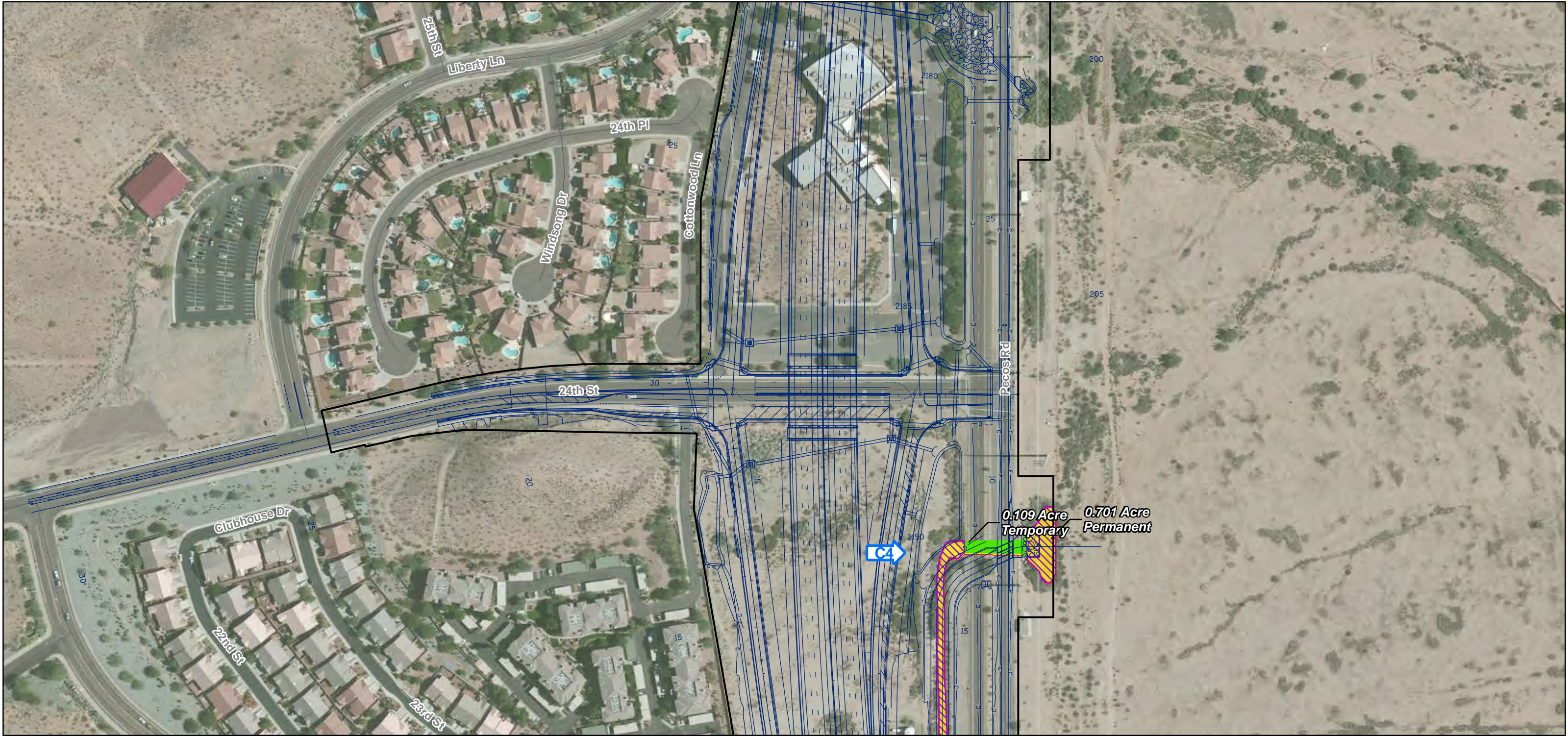
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I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 3 of 21



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- Permanent Impacts
- Temporary Impacts
- Watercourse Number
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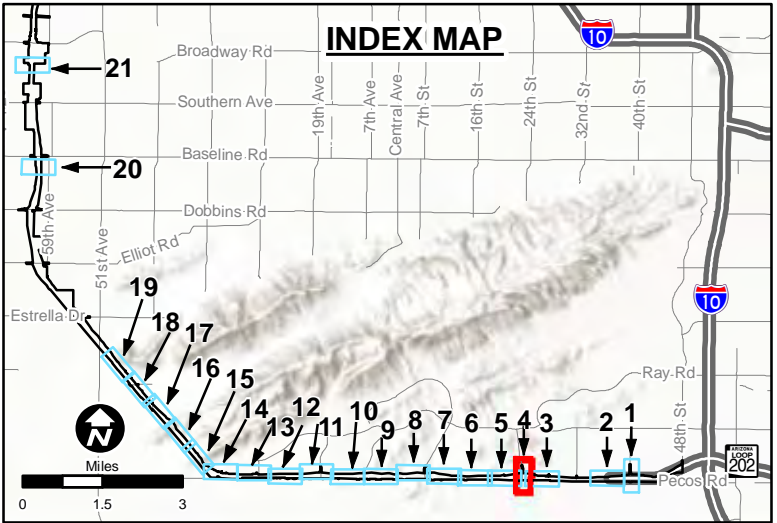


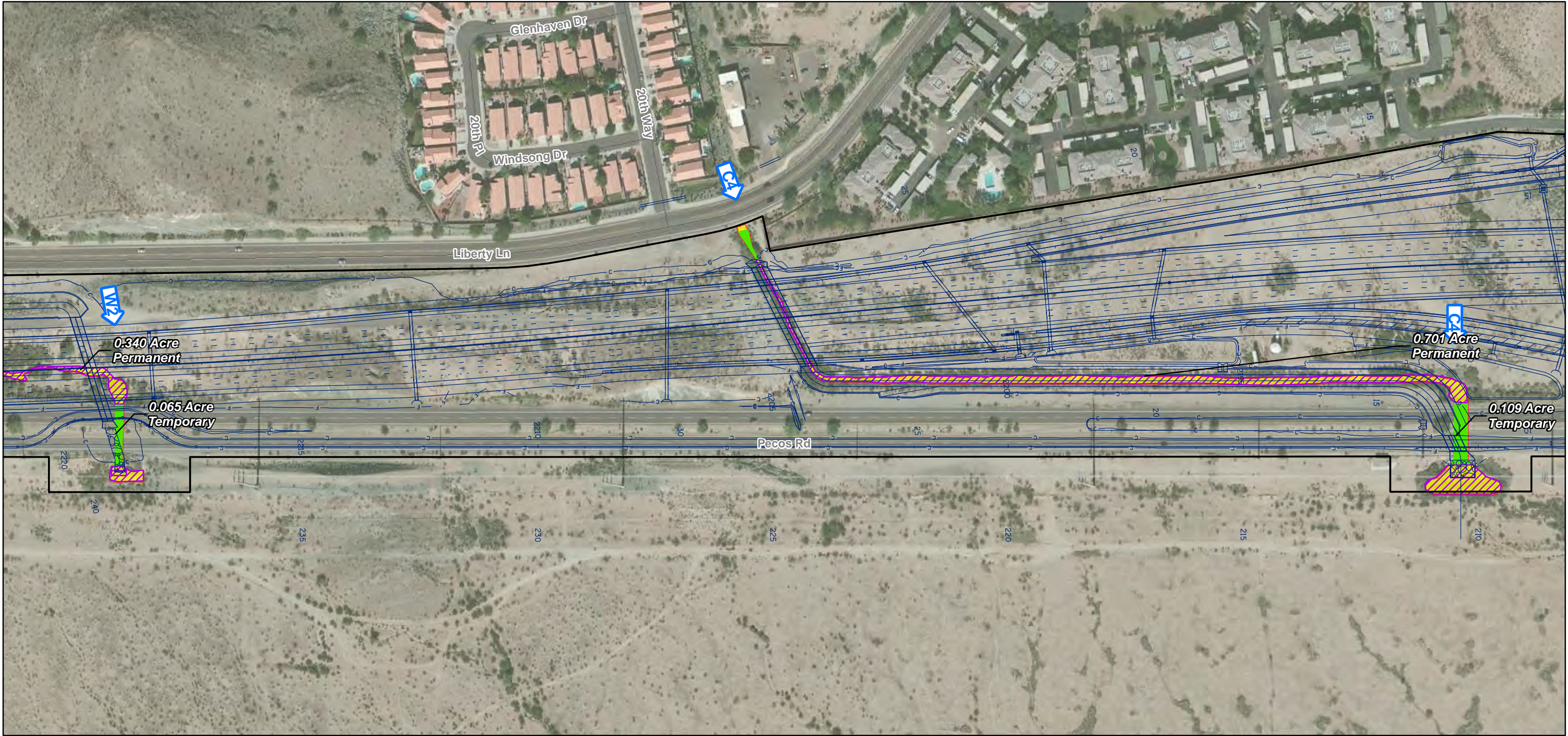
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Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 4 of 21



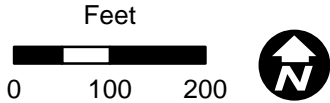
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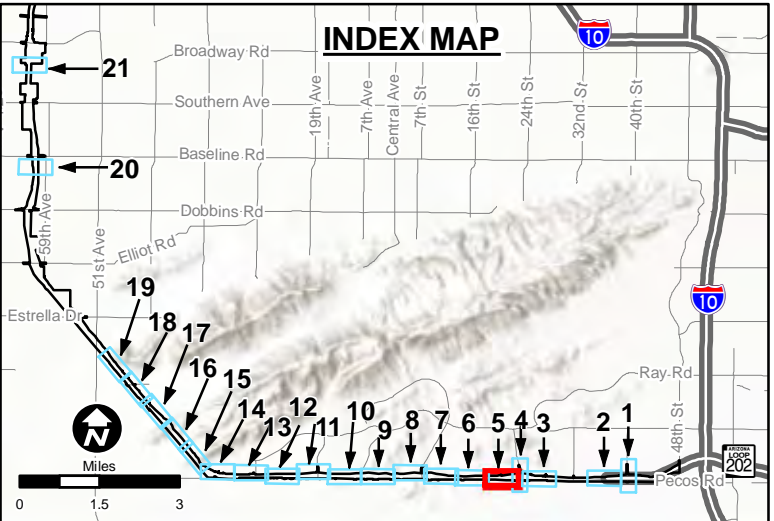


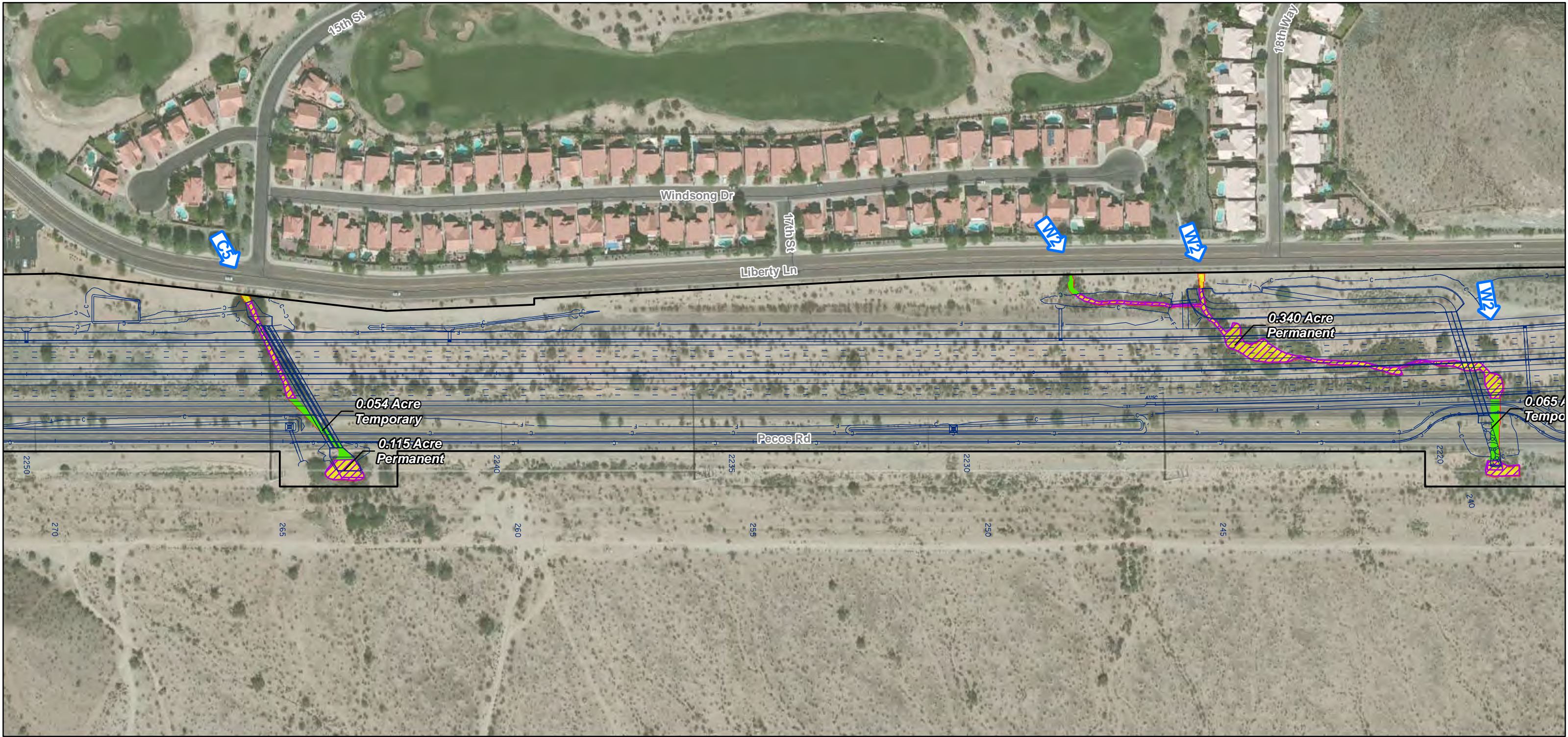
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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 5 of 21



- Design Files (8/30/2017)
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- Waters of the US
- Permanent Impacts
- Temporary Impacts
- Watercourse Number
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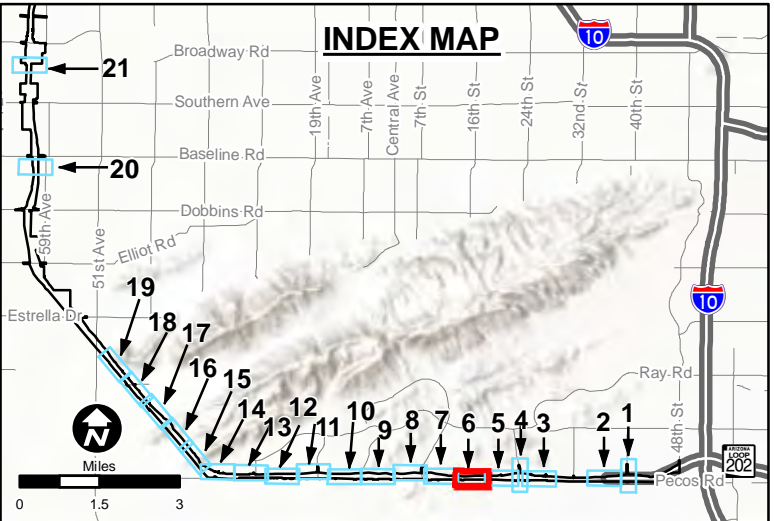


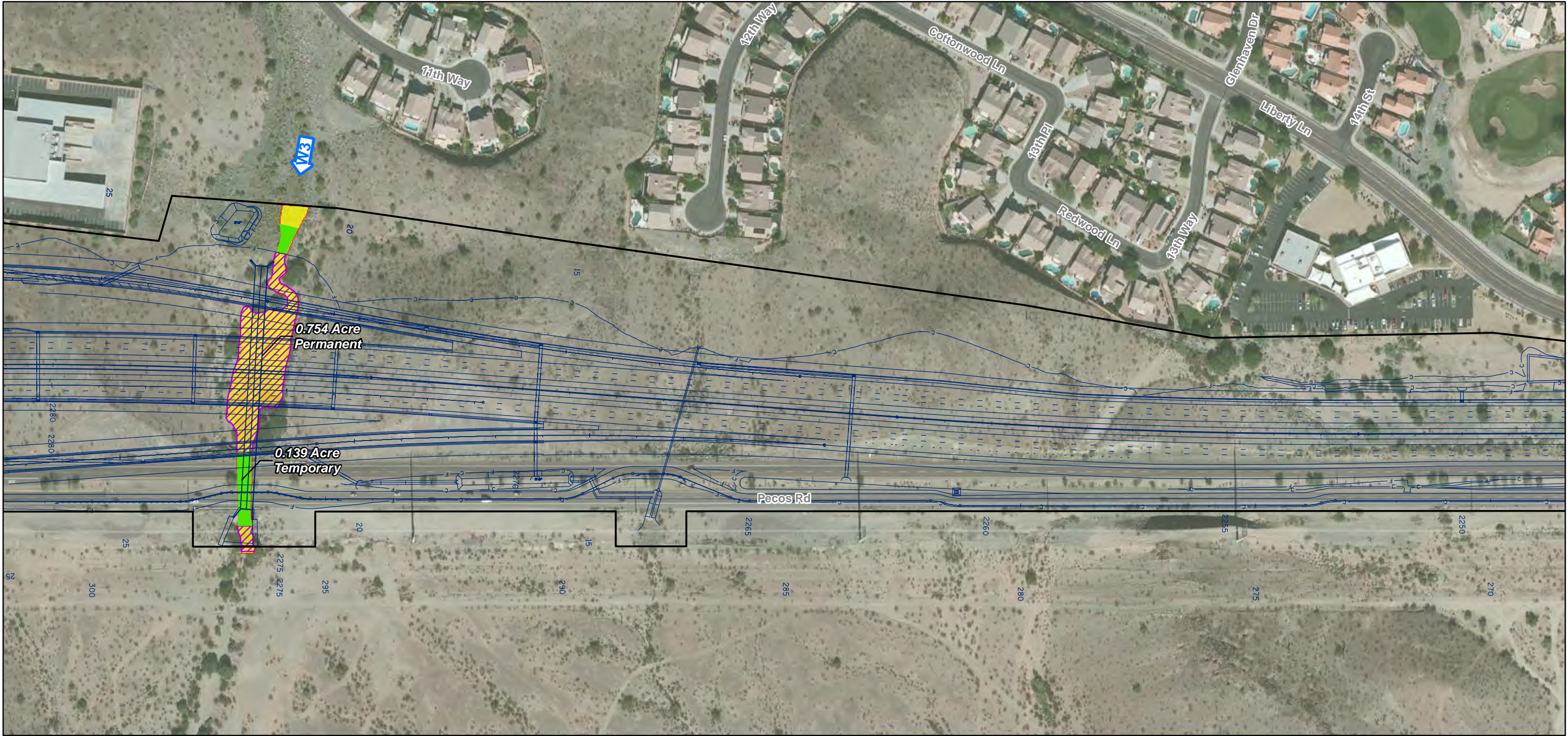
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Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 6 of 21



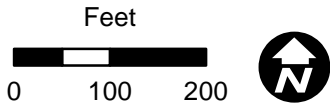
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- Temporary Impacts
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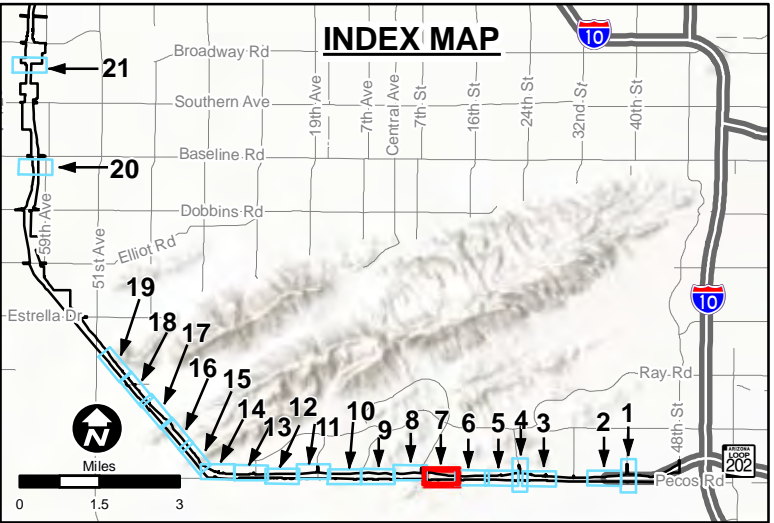


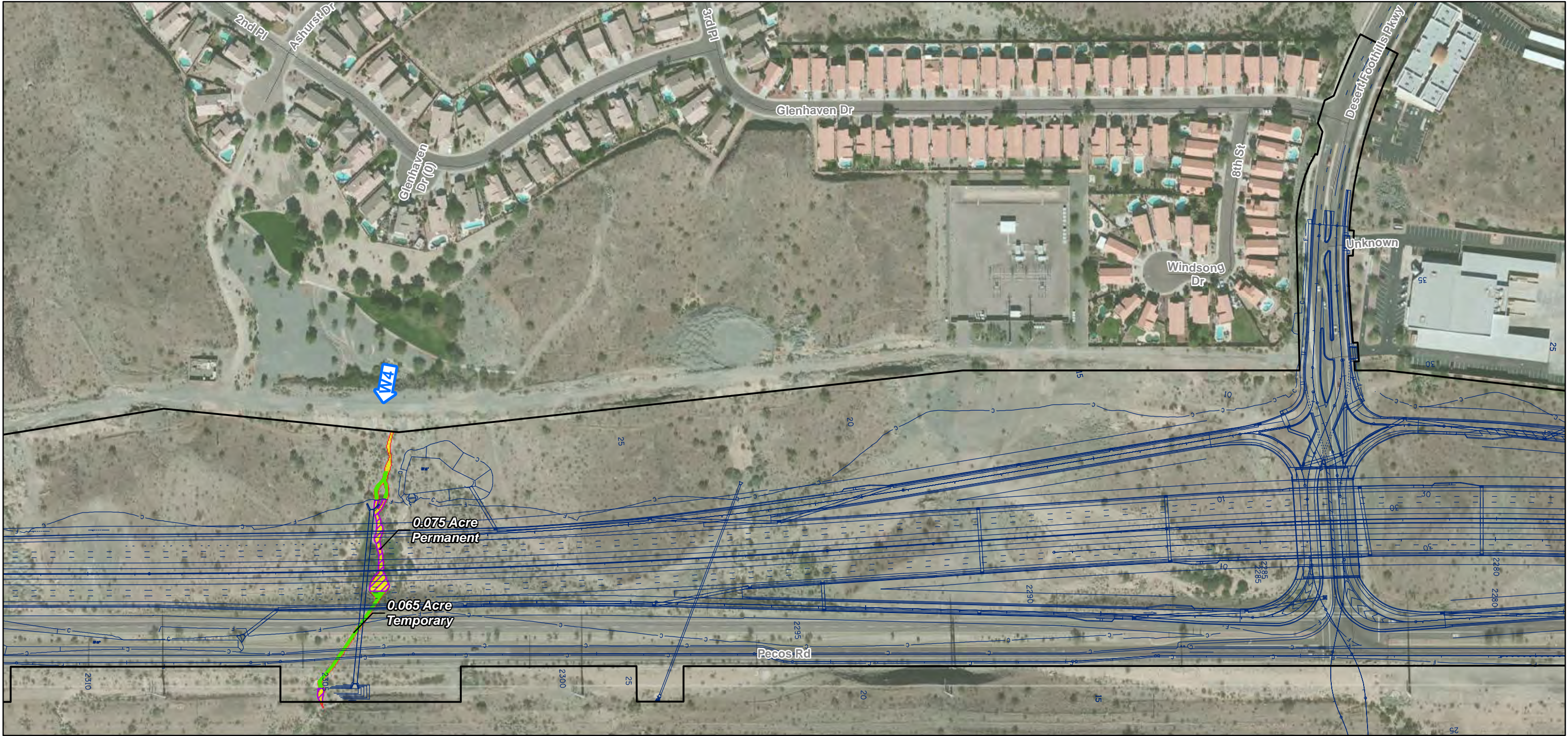
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Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 7 of 21



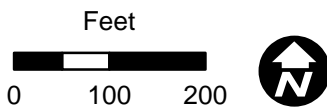
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- Temporary Impacts
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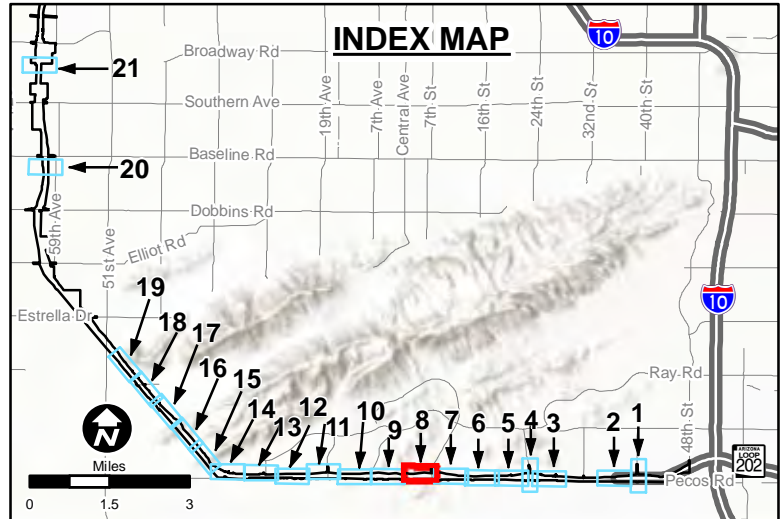


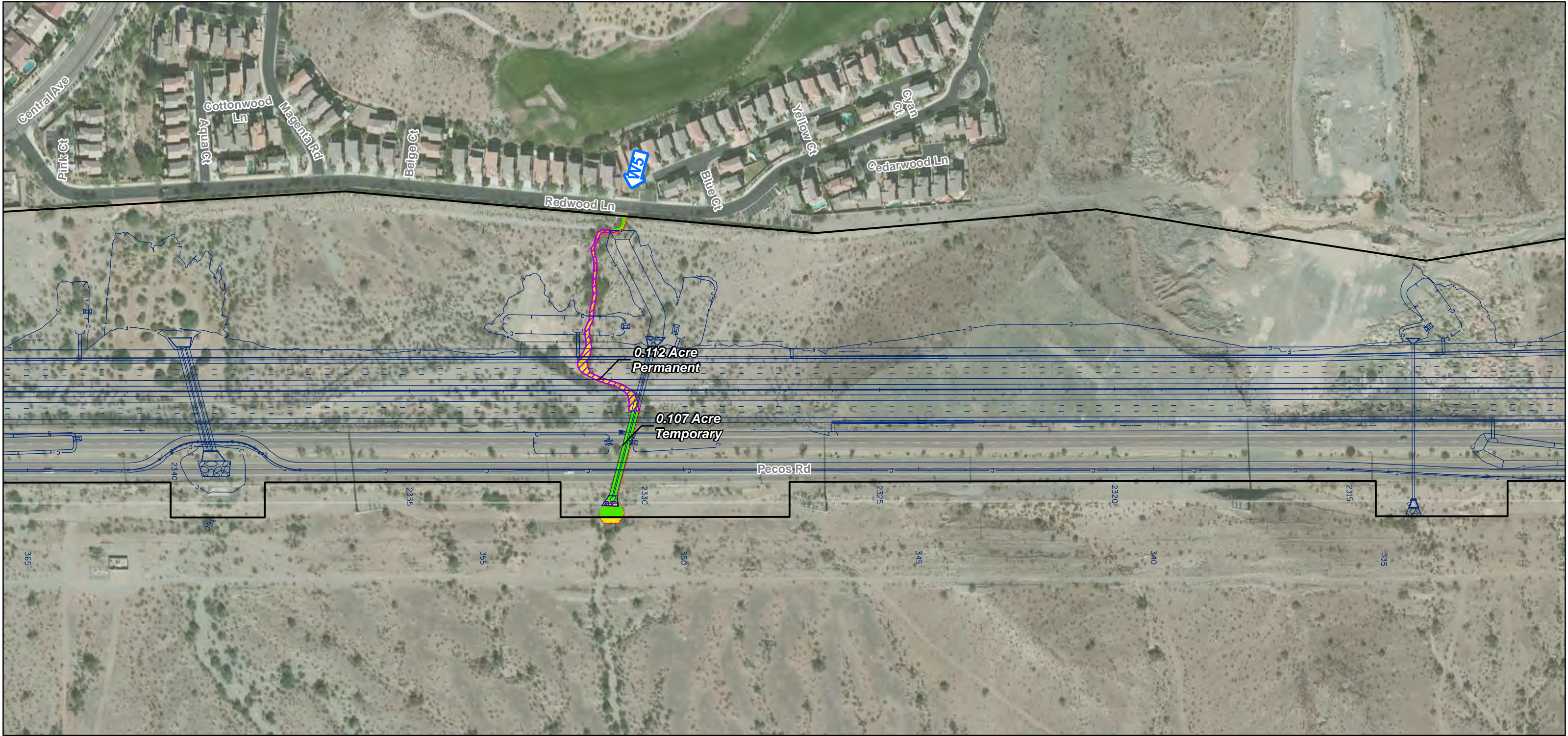
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ALTERNATIVE C - CONNECT 202 PARTNERS DESIGN
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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 8 of 21



- Design Files (8/30/2017)
- Project Limits
- Waters of the US
- Permanent Impacts
- Temporary Impacts
- Watercourse Number
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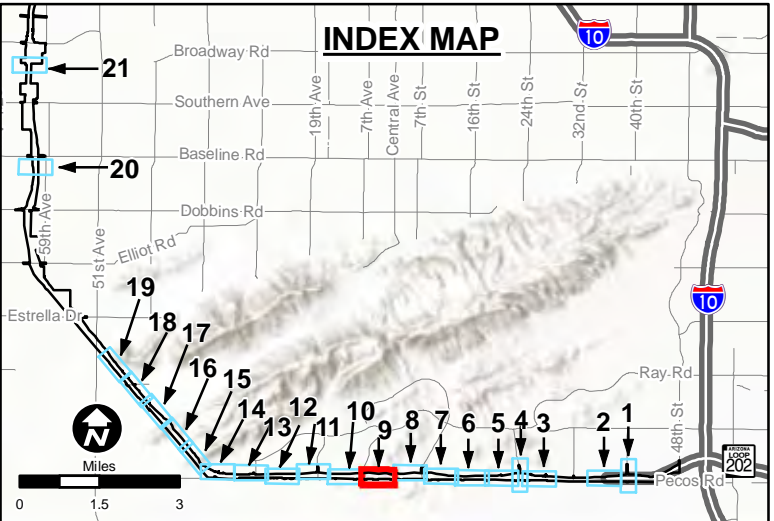


Sources: AZTEC (2017), HDR (2014). ESRI World Imagery (Aerial Photo Date: 5/29/2015)

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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 9 of 21



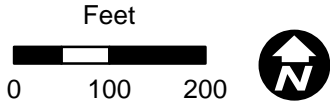
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- Temporary Impacts
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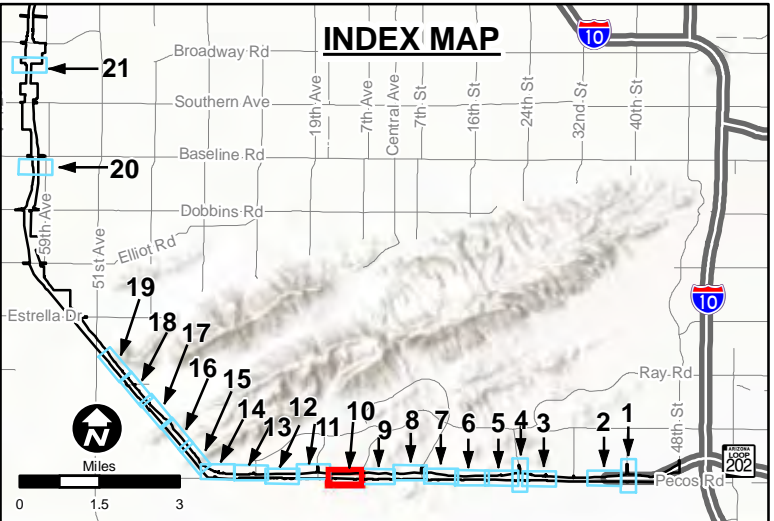


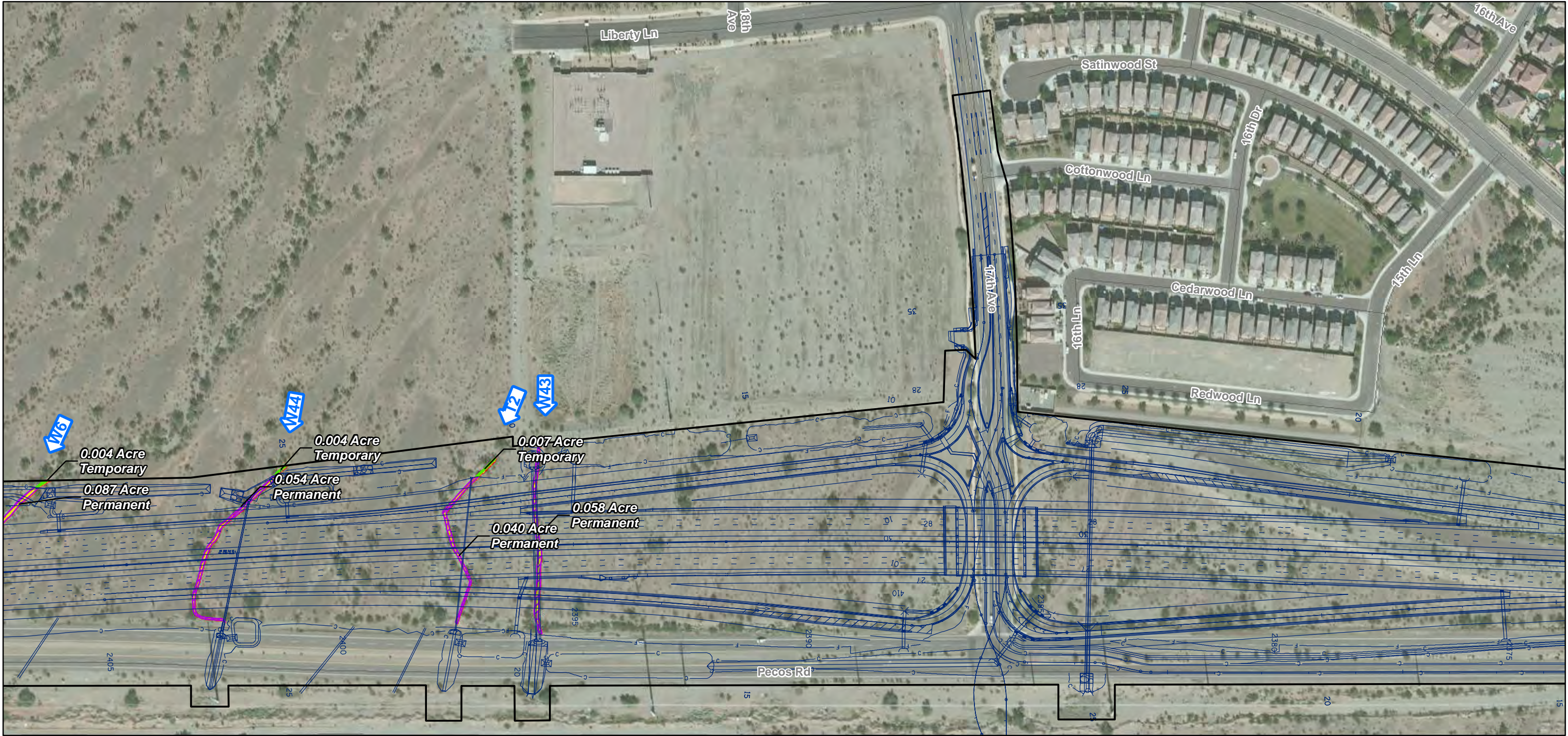
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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 10 of 21



- Design Files (8/30/2017)
- Project Limits
- Waters of the US
- Permanent Impacts
- Temporary Impacts
- Watercourse Number
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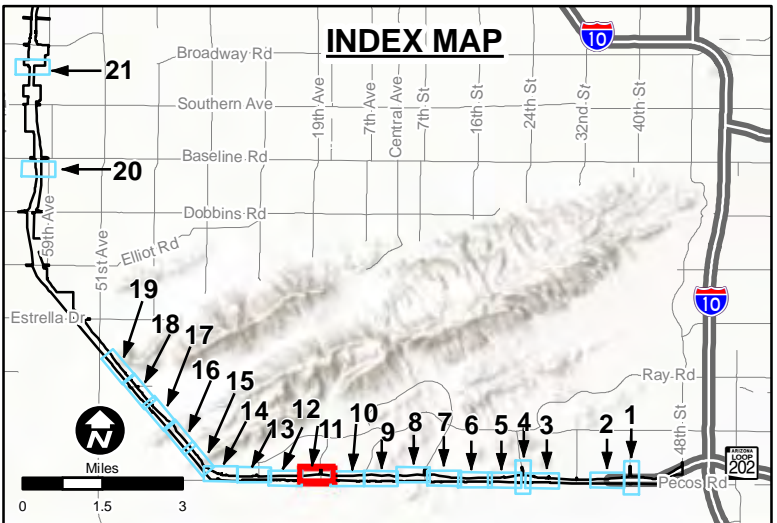


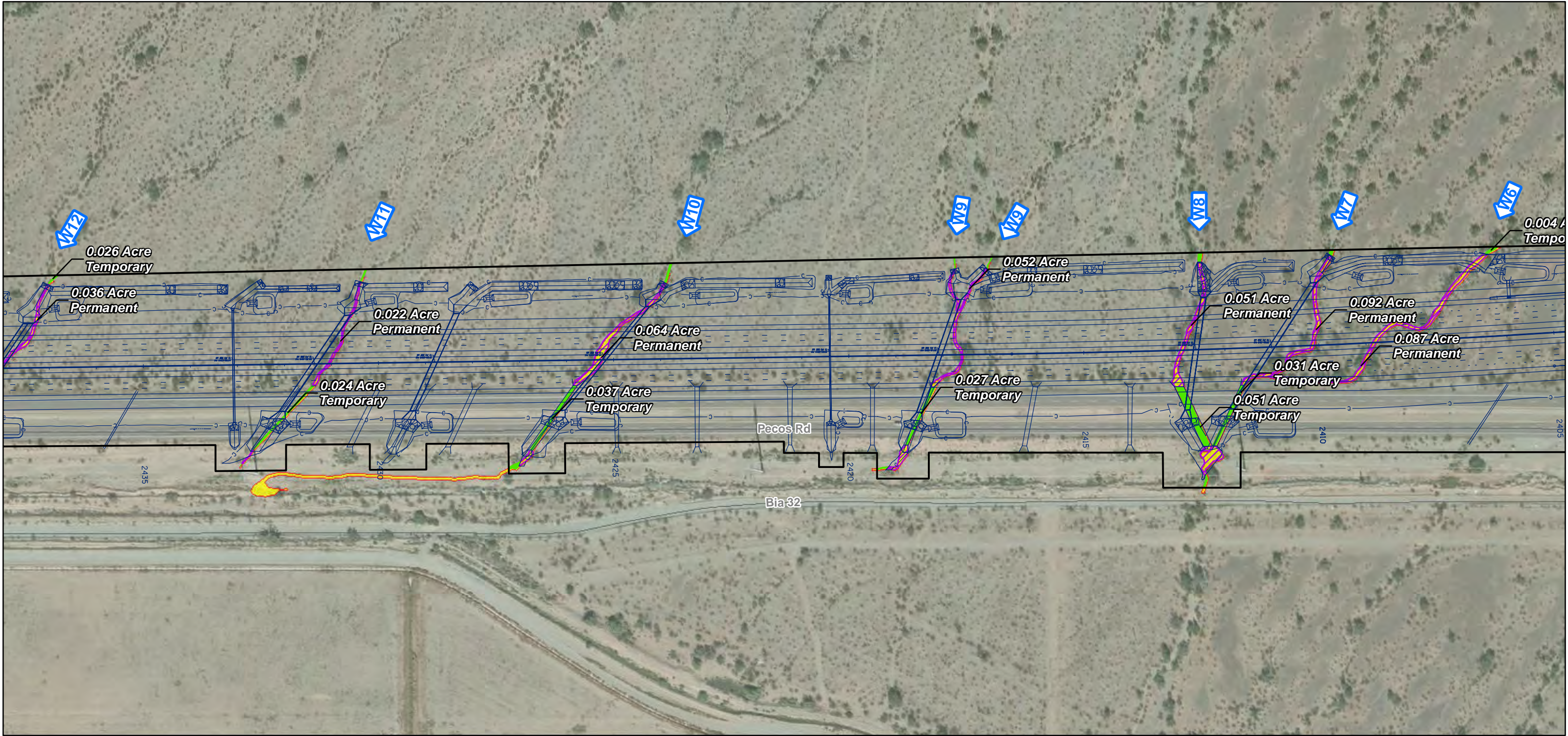
Sources: AZTEC (2017), HDR (2014). ESRI World Imagery (Aerial Photo Date: 5/29/2015)

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ADOT Project Number: 202 MA 054 H8827 01C
Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 11 of 21



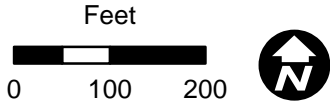
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- Temporary Impacts
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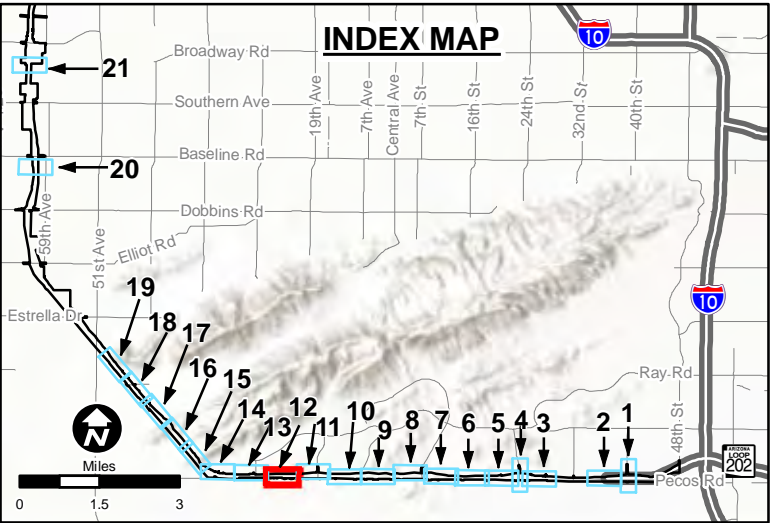


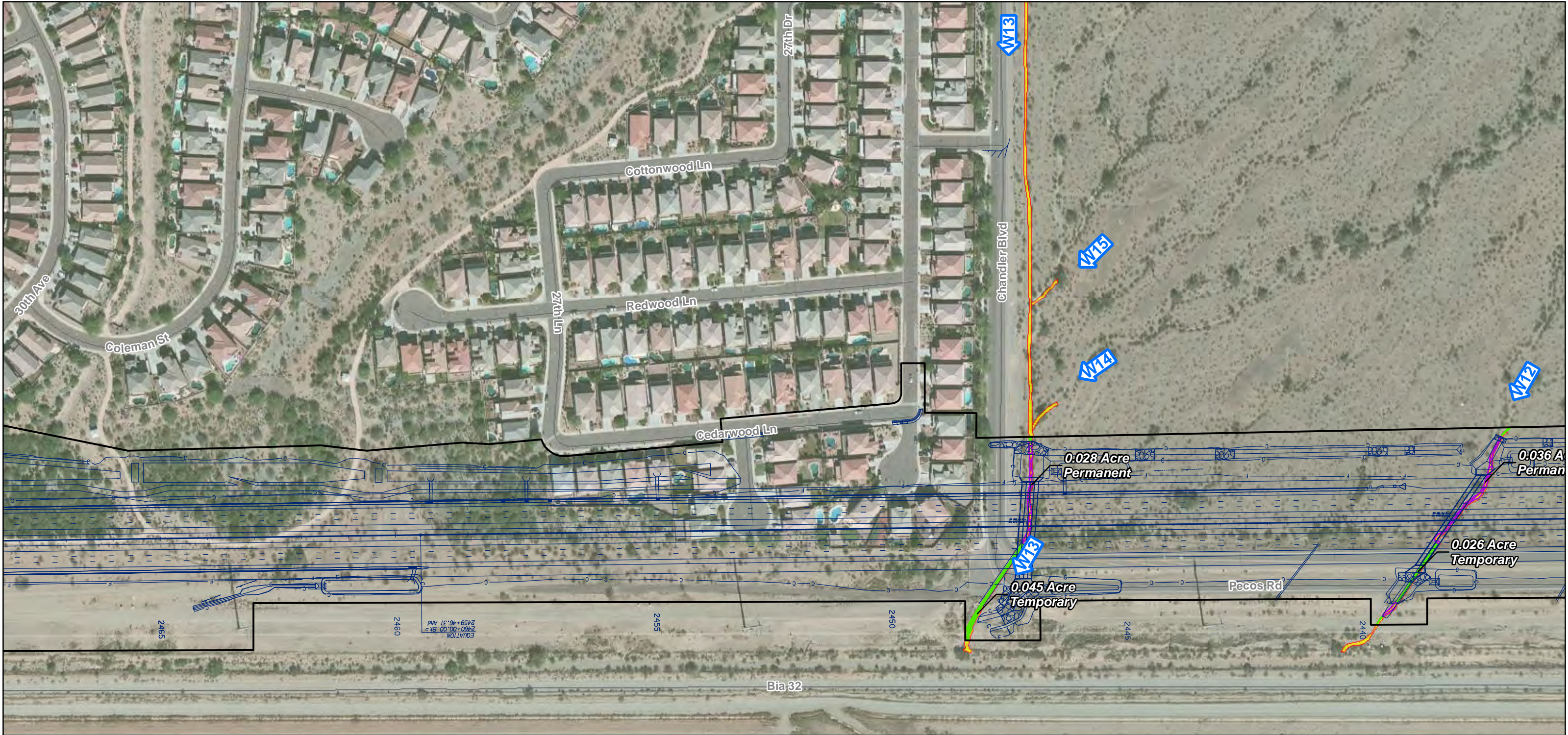
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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 12 of 21



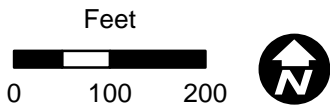
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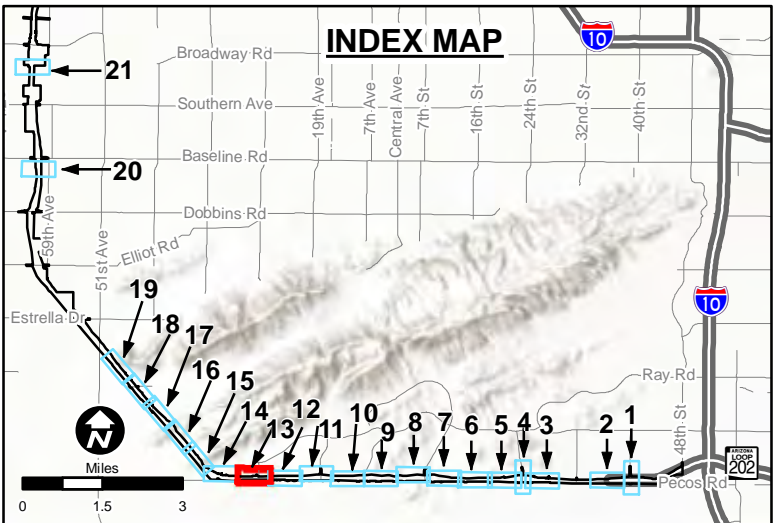


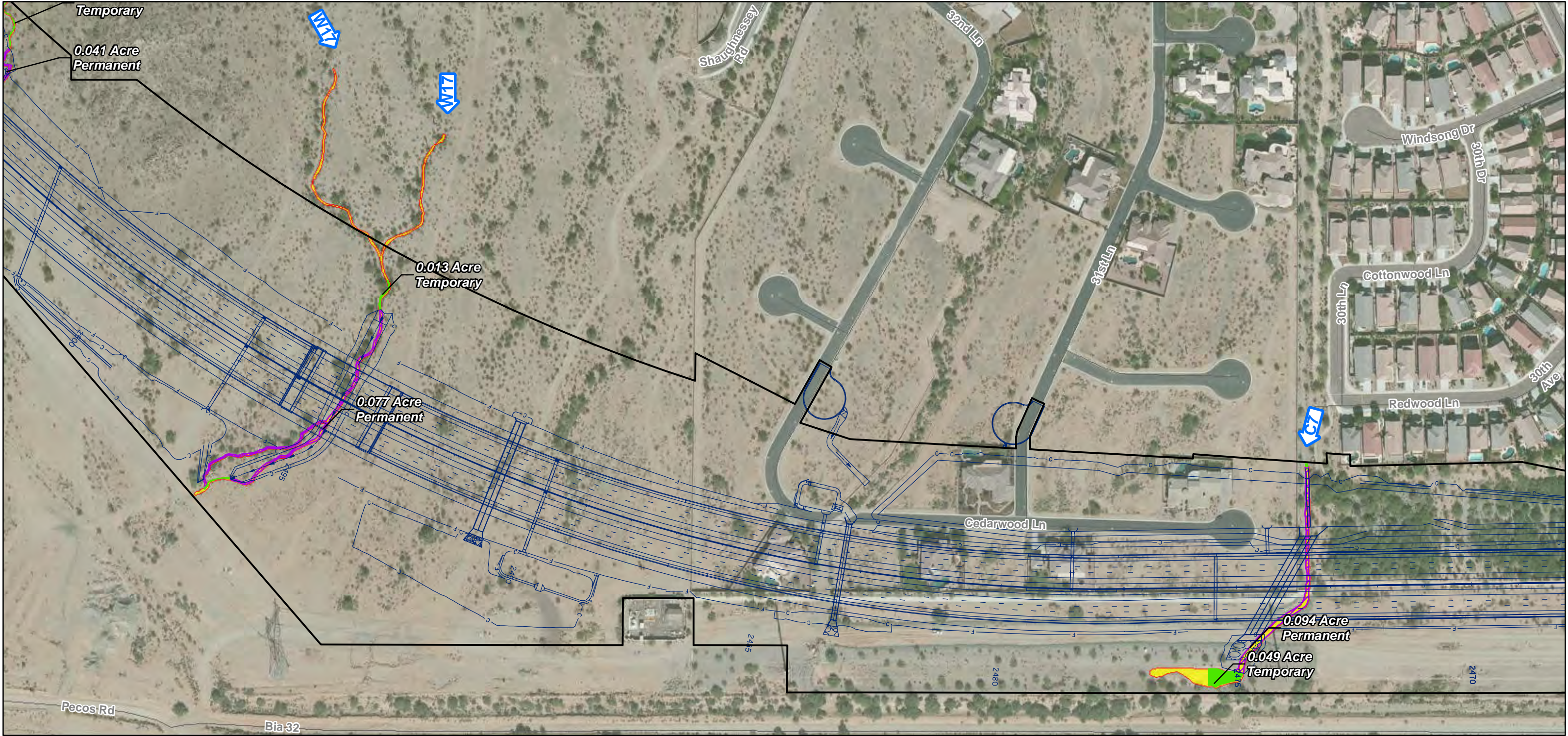
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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 13 of 21



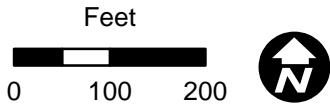
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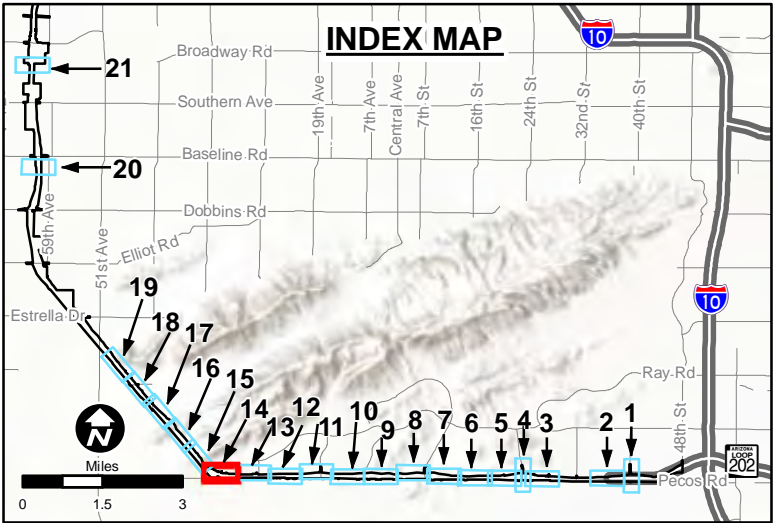


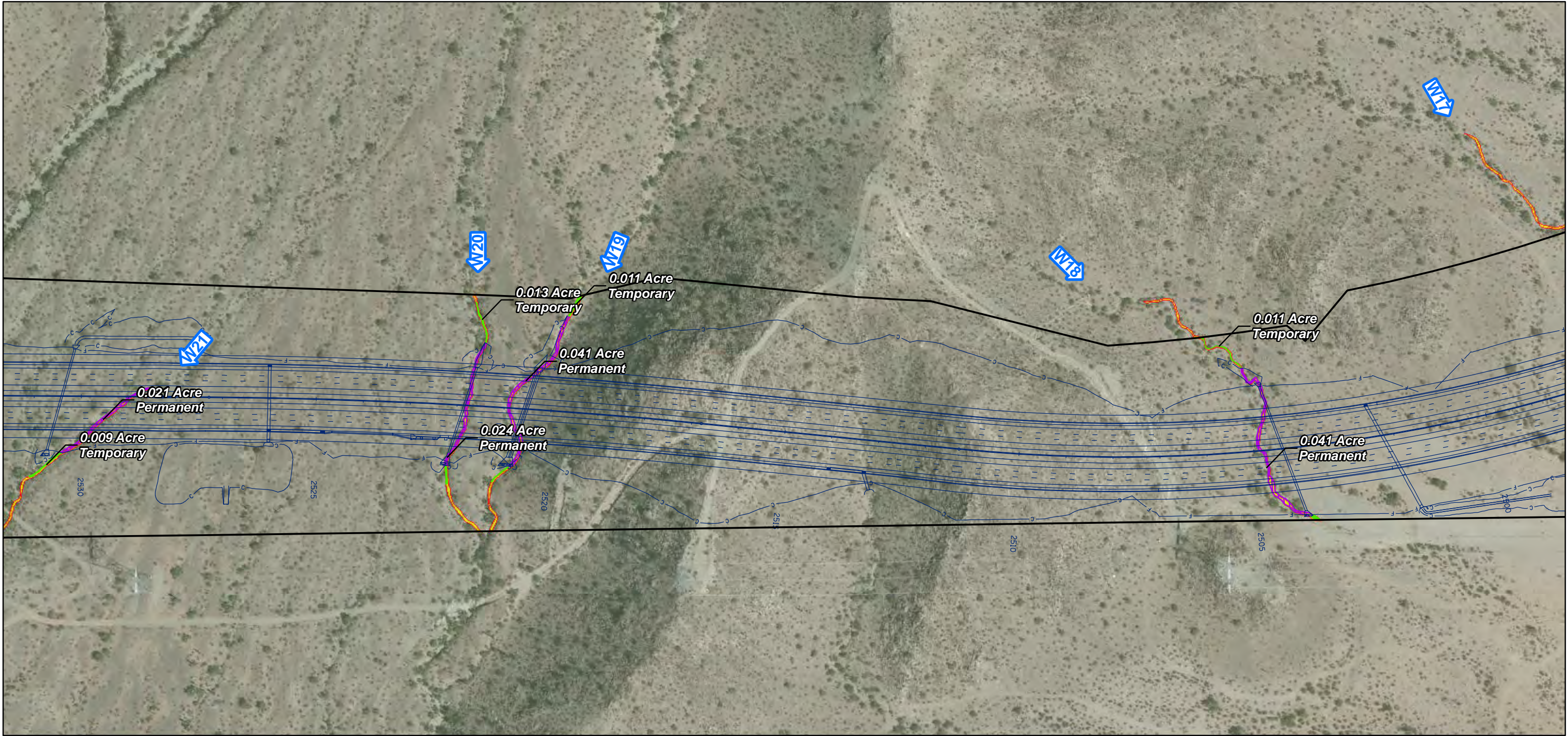
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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 14 of 21



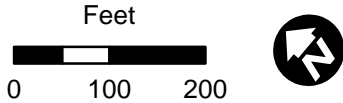
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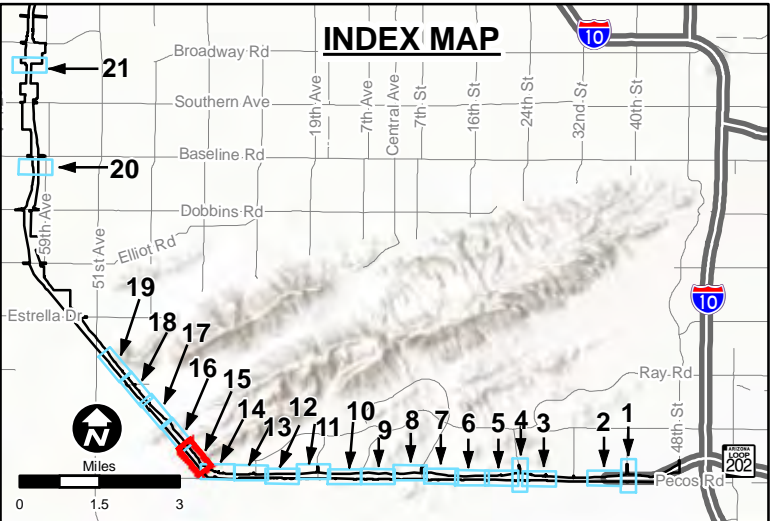


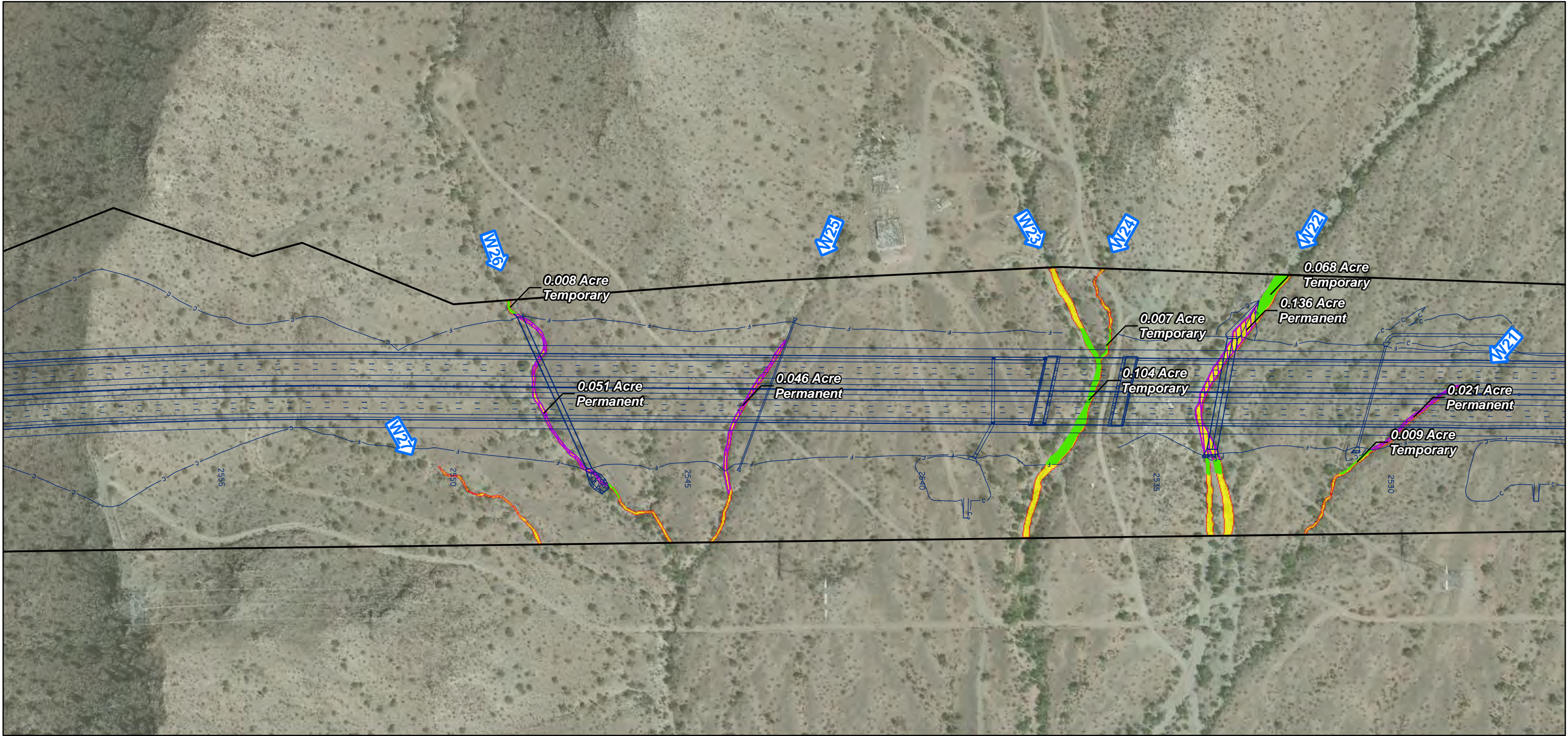
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ALTERNATIVE C - CONNECT 202 PARTNERS DESIGN
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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 15 of 21



- Design Files (8/30/2017)
- Project Limits
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- Permanent Impacts
- Temporary Impacts
- Watercourse Number
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ALTERNATIVE C - CONNECT 202 PARTNERS DESIGN
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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 16 of 21

- Design Files (8/30/2017)

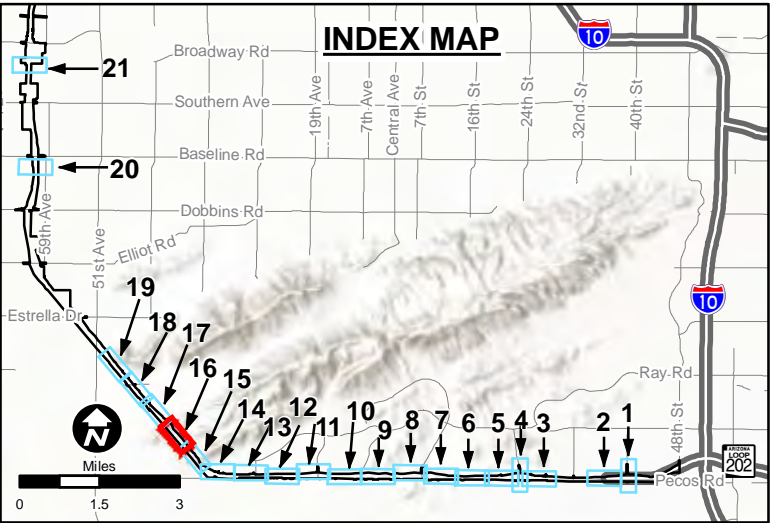
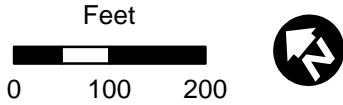
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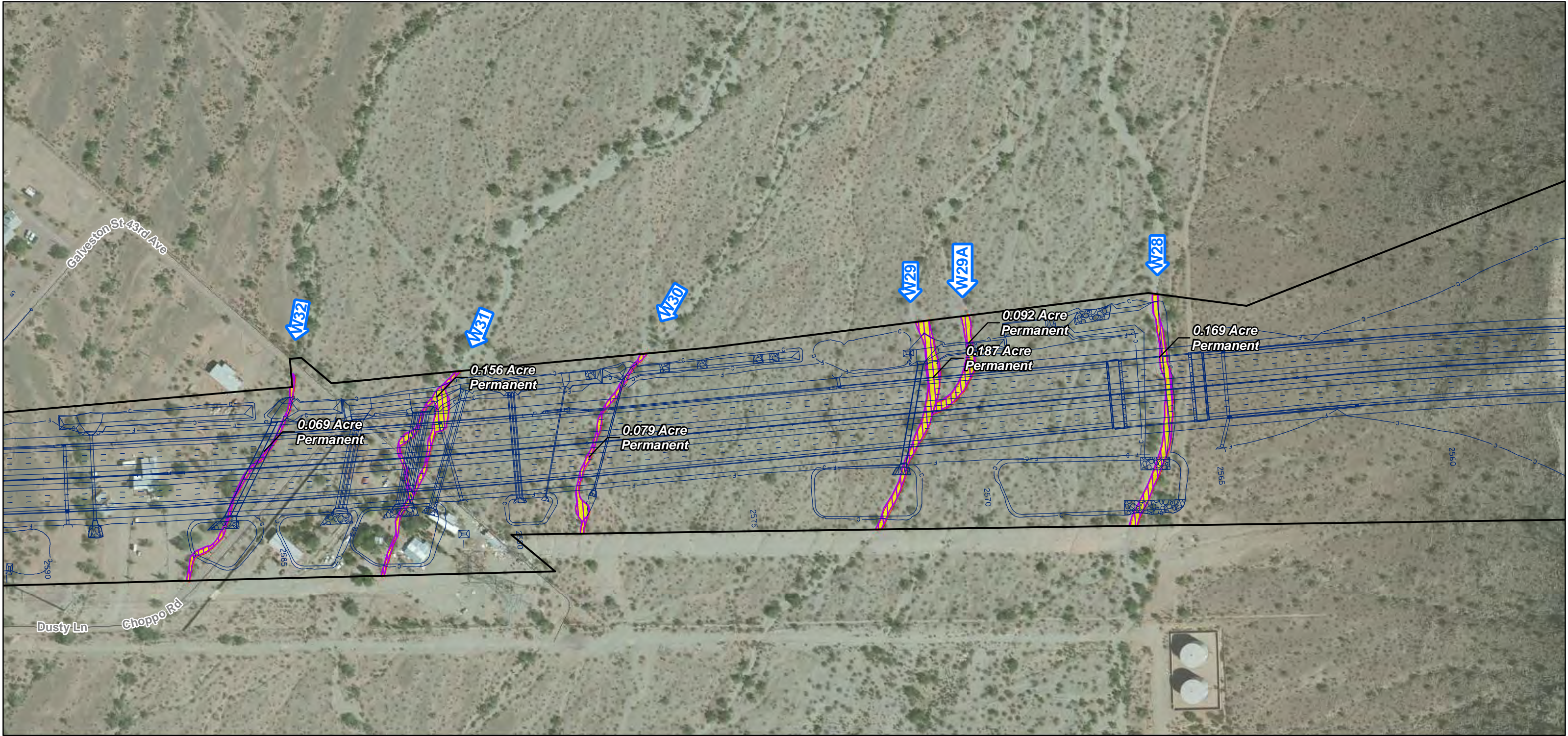
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Temporary Impacts

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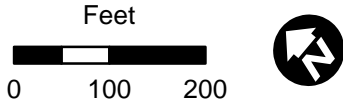
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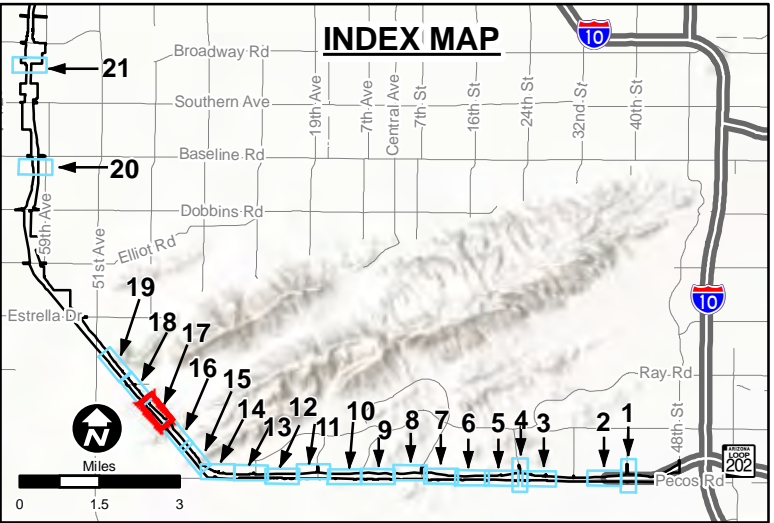


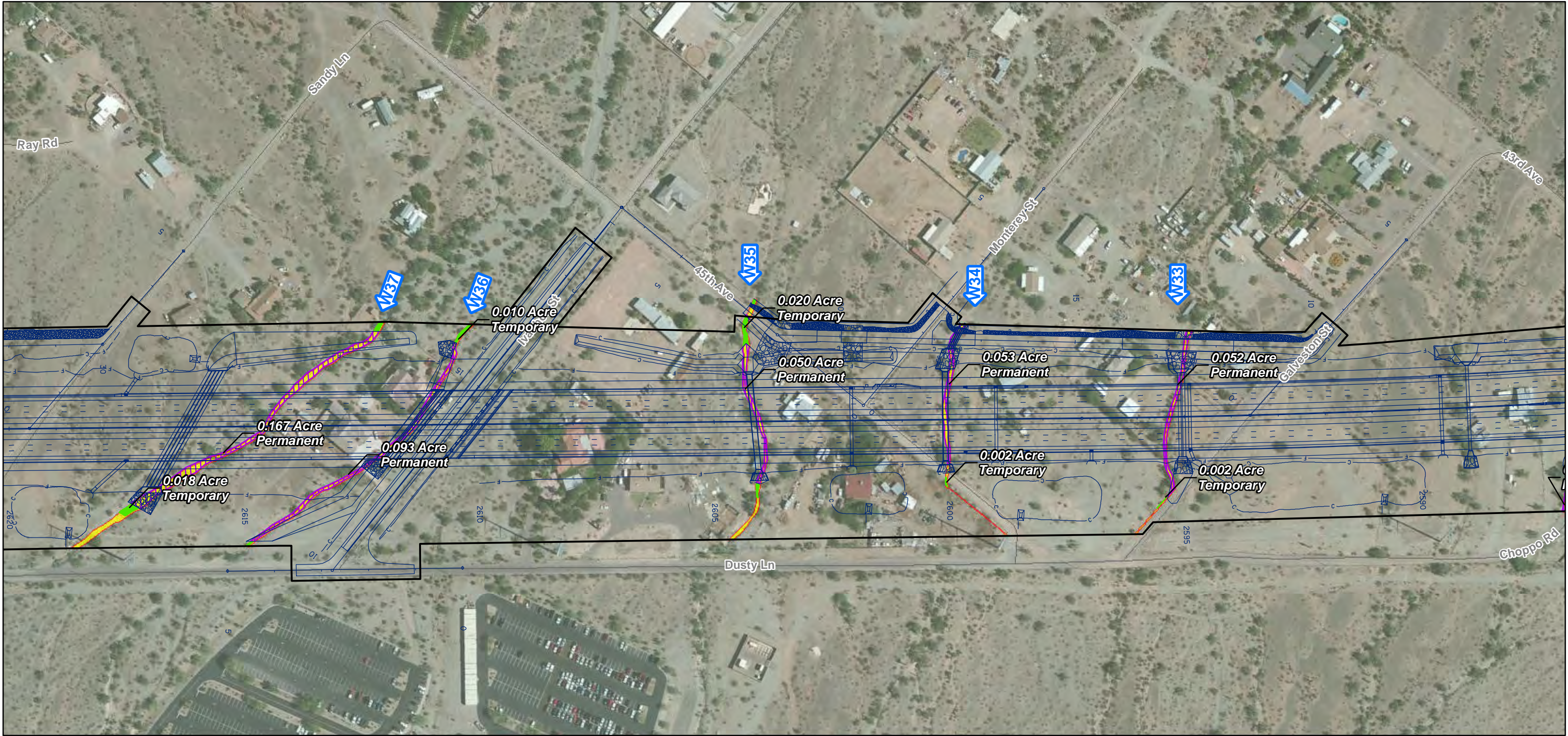
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ALTERNATIVE C - CONNECT 202 PARTNERS DESIGN
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Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 17 of 21



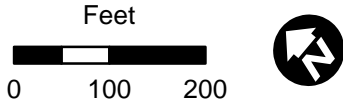
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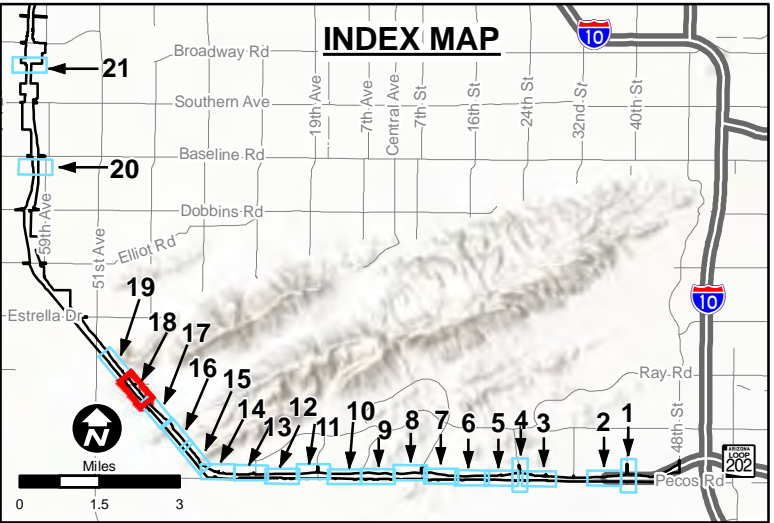


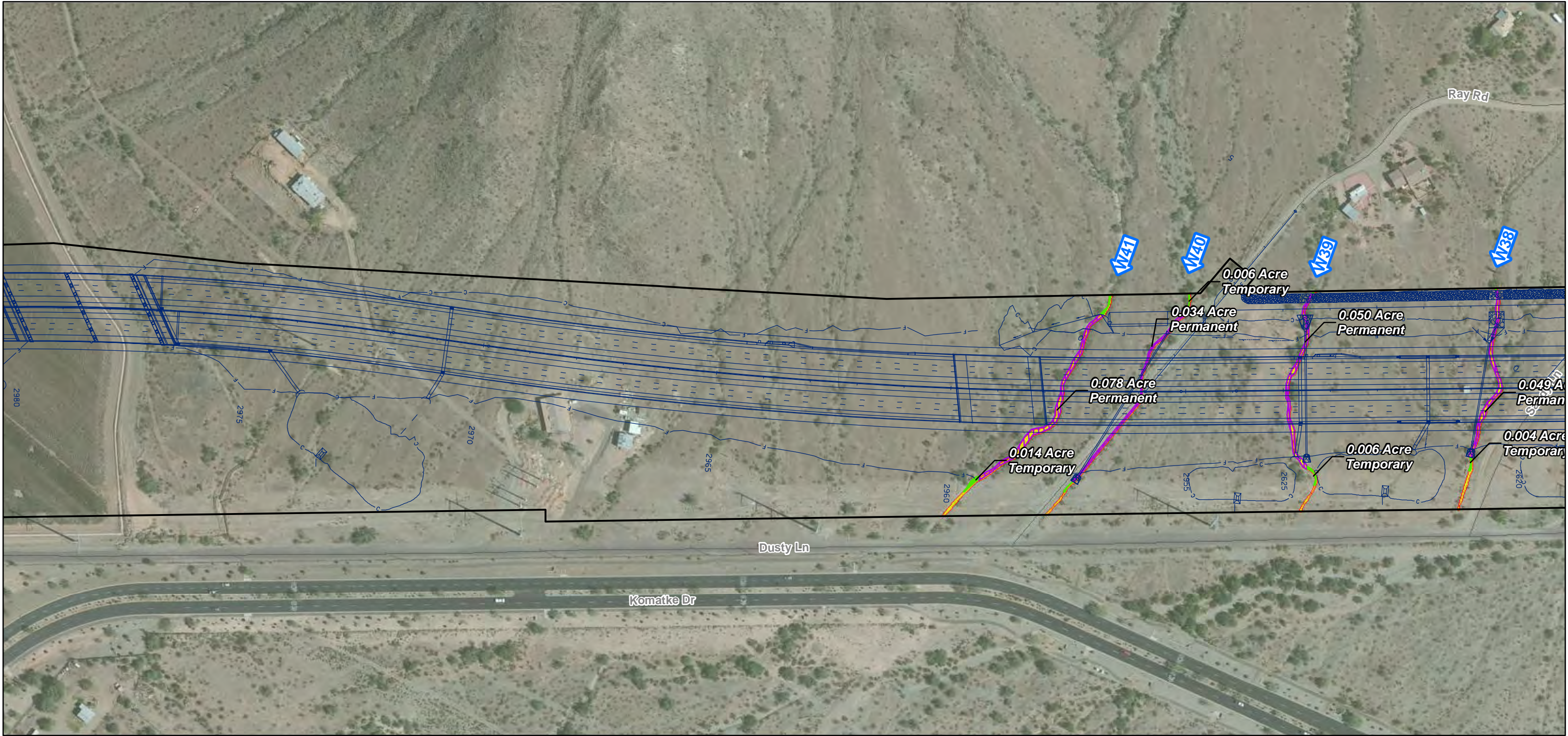
Sources: AZTEC (2017), HDR (2014). ESRI World Imagery (Aerial Photo Date: 5/29/2015)

ALTERNATIVE C - CONNECT 202 PARTNERS DESIGN
IMPACTS TO WATERS OF THE US
Corps File Number: SPL-2002-00055
ADOT Project Number: 202 MA 054 H8827 01C
Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 18 of 21



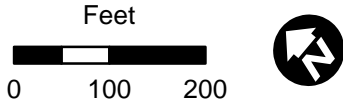
- Design Files (8/30/2017)
- Project Limits
- Waters of the US
- Permanent Impacts
- Temporary Impacts
- Watercourse Number
Arrow Indicates Flow Direction



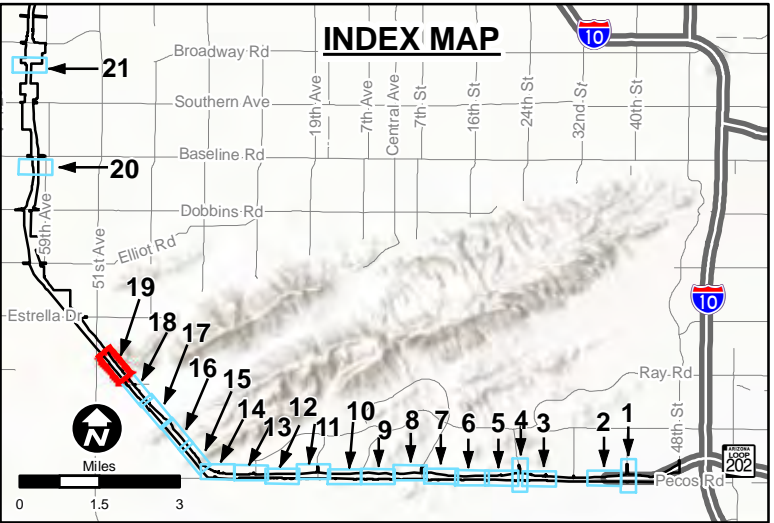


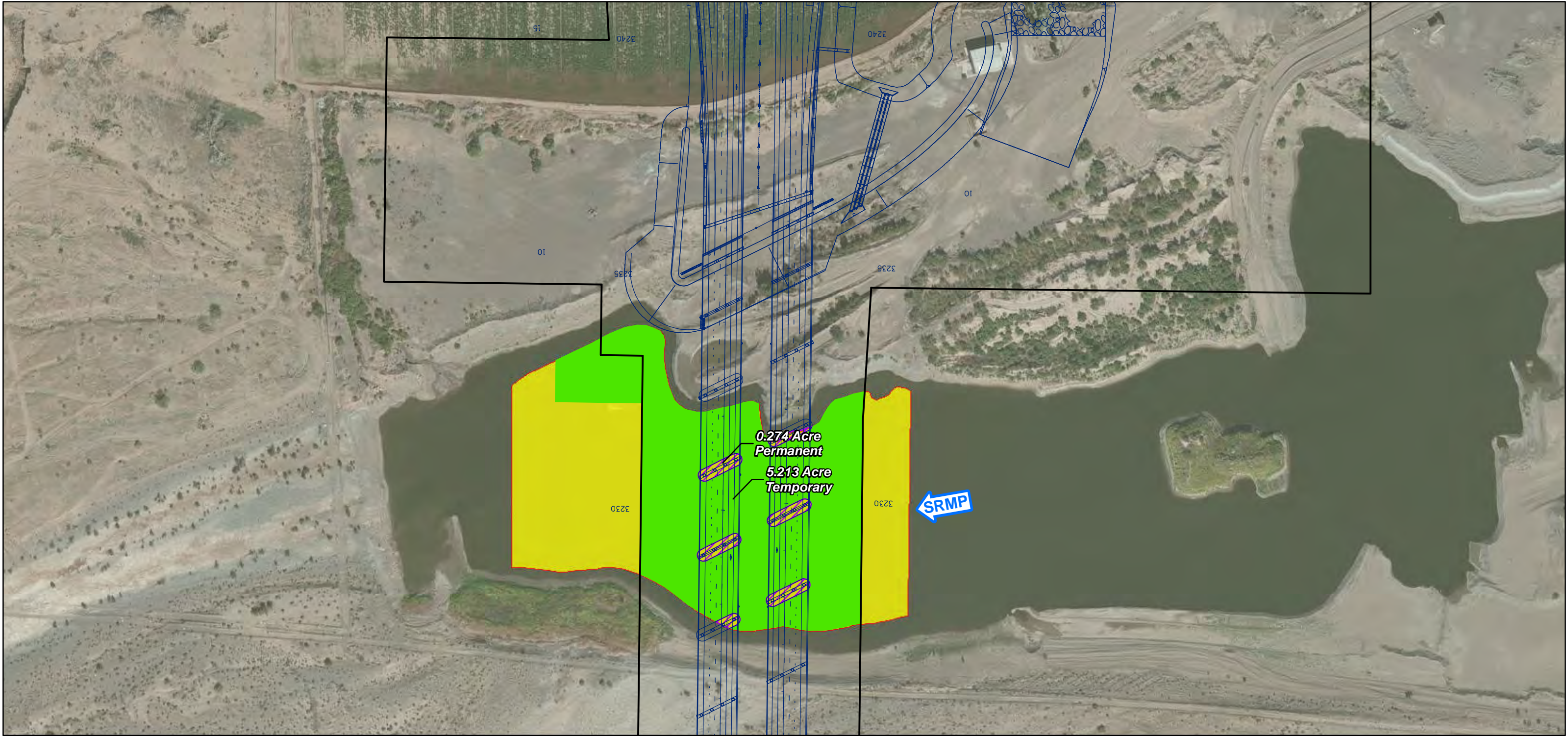
Sources: AZTEC (2017), HDR (2014). ESRI World Imagery (Aerial Photo Date: 5/29/2015)

ALTERNATIVE C - CONNECT 202 PARTNERS DESIGN
IMPACTS TO WATERS OF THE US
Corps File Number: SPL-2002-00055
ADOT Project Number: 202 MA 054 H8827 01C
Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 19 of 21



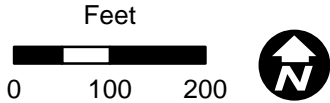
- Design Files (8/30/2017)
- Project Limits
- Waters of the US
- Permanent Impacts
- Temporary Impacts
- Watercourse Number
Arrow Indicates Flow Direction



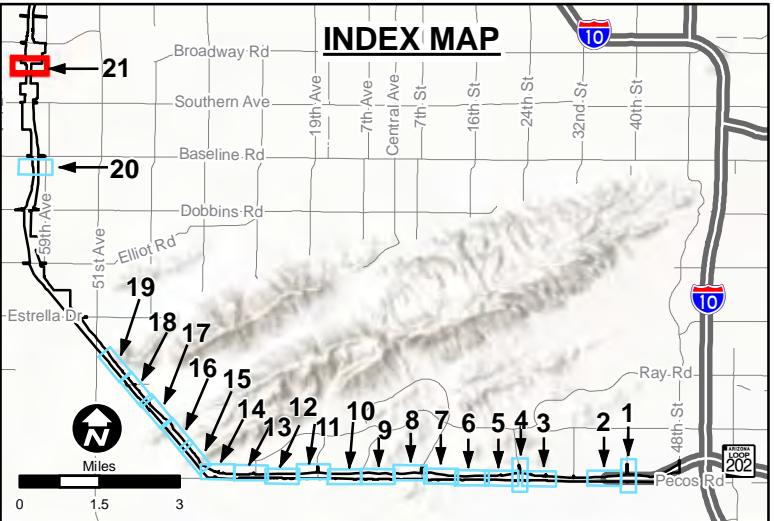


Sources: AZTEC (2017), HDR (2014). ESRI World Imagery (Aerial Photo Date: 5/29/2015)

ALTERNATIVE C - CONNECT 202 PARTNERS DESIGN
IMPACTS TO WATERS OF THE US
Corps File Number: SPL-2002-00055
ADOT Project Number: 202 MA 054 H8827 01C
Project Name: SR 202L(South Mountain Freeway)
I-10 (Maricopa Freeway) - I-10 (Papago Freeway)
Print Date: 10/4/2017, Mike Myers, AZTEC
SHEET 21 of 21



- Design Files (8/30/2017)
- Project Limits
- Waters of the US
- Permanent Impacts
- Temporary Impacts
- Watercourse Number
Arrow Indicates Flow Direction



APPENDIX B

MOVES2014a Generated Emission factors from Construction Equipment

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	1	5	4	4013	2	Cranes	23	1	1	48.42670243	g/vehicle per day
2	2017	1	5	4	4013	2	Cranes	23	2	1	156.0788374	g/vehicle per day
2	2017	1	5	4	4013	2	Cranes	23	3	1	586.0715651	g/vehicle per day
2	2017	1	5	4	4013	2	Cranes	23	79	1	44.38818992	g/vehicle per day
2	2017	1	5	4	4013	2	Cranes	23	87	1	54.7975935	g/vehicle per day
2	2017	1	5	4	4013	2	Cranes	23	100	1	27.59160865	g/vehicle per day
2	2017	2	5	4	4013	2	Cranes	23	1	1	53.61528356	g/vehicle per day
2	2017	2	5	4	4013	2	Cranes	23	2	1	172.801574	g/vehicle per day
2	2017	2	5	4	4013	2	Cranes	23	3	1	648.865196	g/vehicle per day
2	2017	2	5	4	4013	2	Cranes	23	79	1	49.14405914	g/vehicle per day
2	2017	2	5	4	4013	2	Cranes	23	87	1	60.66876724	g/vehicle per day
2	2017	2	5	4	4013	2	Cranes	23	100	1	30.54785104	g/vehicle per day
2	2017	3	5	4	4013	2	Cranes	23	1	1	54.2379043	g/vehicle per day
2	2017	3	5	4	4013	2	Cranes	23	2	1	174.8082133	g/vehicle per day
2	2017	3	5	4	4013	2	Cranes	23	3	1	656.4001689	g/vehicle per day
2	2017	3	5	4	4013	2	Cranes	23	79	1	49.71475326	g/vehicle per day
2	2017	3	5	4	4013	2	Cranes	23	87	1	61.37330168	g/vehicle per day
2	2017	3	5	4	4013	2	Cranes	23	100	1	30.90260079	g/vehicle per day
2	2017	4	5	4	4013	2	Cranes	23	1	1	56.04584383	g/vehicle per day
2	2017	4	5	4	4013	2	Cranes	23	2	1	180.6351778	g/vehicle per day
2	2017	4	5	4	4013	2	Cranes	23	3	1	678.2802133	g/vehicle per day
2	2017	4	5	4	4013	2	Cranes	23	79	1	51.37194049	g/vehicle per day
2	2017	4	5	4	4013	2	Cranes	23	87	1	63.41905304	g/vehicle per day
2	2017	4	5	4	4013	2	Cranes	23	100	1	31.9326856	g/vehicle per day
2	2017	5	5	4	4013	2	Cranes	23	1	1	54.2379043	g/vehicle per day
2	2017	5	5	4	4013	2	Cranes	23	2	1	174.8082133	g/vehicle per day
2	2017	5	5	4	4013	2	Cranes	23	3	1	656.4001689	g/vehicle per day
2	2017	5	5	4	4013	2	Cranes	23	79	1	49.71475326	g/vehicle per day
2	2017	5	5	4	4013	2	Cranes	23	87	1	61.37330168	g/vehicle per day
2	2017	5	5	4	4013	2	Cranes	23	100	1	30.90260079	g/vehicle per day
2	2017	6	5	4	4013	2	Cranes	23	1	1	60.71632359	g/vehicle per day
2	2017	6	5	4	4013	2	Cranes	23	2	1	195.6881321	g/vehicle per day
2	2017	6	5	4	4013	2	Cranes	23	3	1	734.8036263	g/vehicle per day
2	2017	6	5	4	4013	2	Cranes	23	79	1	55.6529143	g/vehicle per day
2	2017	6	5	4	4013	2	Cranes	23	87	1	68.70400413	g/vehicle per day
2	2017	6	5	4	4013	2	Cranes	23	100	1	34.59372788	g/vehicle per day
2	2017	7	5	4	4013	2	Cranes	23	1	1	58.75771607	g/vehicle per day
2	2017	7	5	4	4013	2	Cranes	23	2	1	189.3755683	g/vehicle per day
2	2017	7	5	4	4013	2	Cranes	23	3	1	711.1001444	g/vehicle per day
2	2017	7	5	4	4013	2	Cranes	23	79	1	53.85763177	g/vehicle per day
2	2017	7	5	4	4013	2	Cranes	23	87	1	66.48771378	g/vehicle per day
2	2017	7	5	4	4013	2	Cranes	23	100	1	33.47781187	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	8	5	4	4013	2	Cranes	23	1	1	58.75771607	g/vehicle per day
2	2017	8	5	4	4013	2	Cranes	23	2	1	189.3755683	g/vehicle per day
2	2017	8	5	4	4013	2	Cranes	23	3	1	711.1001444	g/vehicle per day
2	2017	8	5	4	4013	2	Cranes	23	79	1	53.85763177	g/vehicle per day
2	2017	8	5	4	4013	2	Cranes	23	87	1	66.48771378	g/vehicle per day
2	2017	8	5	4	4013	2	Cranes	23	100	1	33.47781187	g/vehicle per day
2	2017	9	5	4	4013	2	Cranes	23	1	1	56.04584383	g/vehicle per day
2	2017	9	5	4	4013	2	Cranes	23	2	1	180.6351778	g/vehicle per day
2	2017	9	5	4	4013	2	Cranes	23	3	1	678.2802133	g/vehicle per day
2	2017	9	5	4	4013	2	Cranes	23	79	1	51.37194049	g/vehicle per day
2	2017	9	5	4	4013	2	Cranes	23	87	1	63.41905304	g/vehicle per day
2	2017	9	5	4	4013	2	Cranes	23	100	1	31.9326856	g/vehicle per day
2	2017	10	5	4	4013	2	Cranes	23	1	1	54.2379043	g/vehicle per day
2	2017	10	5	4	4013	2	Cranes	23	2	1	174.8082133	g/vehicle per day
2	2017	10	5	4	4013	2	Cranes	23	3	1	656.4001689	g/vehicle per day
2	2017	10	5	4	4013	2	Cranes	23	79	1	49.71475326	g/vehicle per day
2	2017	10	5	4	4013	2	Cranes	23	87	1	61.37330168	g/vehicle per day
2	2017	10	5	4	4013	2	Cranes	23	100	1	30.90260079	g/vehicle per day
2	2017	11	5	4	4013	2	Cranes	23	1	1	56.04584383	g/vehicle per day
2	2017	11	5	4	4013	2	Cranes	23	2	1	180.6351778	g/vehicle per day
2	2017	11	5	4	4013	2	Cranes	23	3	1	678.2802133	g/vehicle per day
2	2017	11	5	4	4013	2	Cranes	23	79	1	51.37194049	g/vehicle per day
2	2017	11	5	4	4013	2	Cranes	23	87	1	63.41905304	g/vehicle per day
2	2017	11	5	4	4013	2	Cranes	23	100	1	31.9326856	g/vehicle per day
2	2017	12	5	4	4013	2	Cranes	23	1	1	48.42670243	g/vehicle per day
2	2017	12	5	4	4013	2	Cranes	23	2	1	156.0788374	g/vehicle per day
2	2017	12	5	4	4013	2	Cranes	23	3	1	586.0715651	g/vehicle per day
2	2017	12	5	4	4013	2	Cranes	23	79	1	44.38818992	g/vehicle per day
2	2017	12	5	4	4013	2	Cranes	23	87	1	54.7975935	g/vehicle per day
2	2017	12	5	4	4013	2	Cranes	23	100	1	27.59160865	g/vehicle per day
1	2018	1	5	4	4013	2	Cranes	23	1	1	46.17876148	g/vehicle per day
1	2018	1	5	4	4013	2	Cranes	23	2	1	137.6947112	g/vehicle per day
1	2018	1	5	4	4013	2	Cranes	23	3	1	513.7836909	g/vehicle per day
1	2018	1	5	4	4013	2	Cranes	23	79	1	42.20417938	g/vehicle per day
1	2018	1	5	4	4013	2	Cranes	23	87	1	52.52585577	g/vehicle per day
1	2018	1	5	4	4013	2	Cranes	23	100	1	24.08792368	g/vehicle per day
1	2018	2	5	4	4013	2	Cranes	23	1	1	51.12649015	g/vehicle per day
1	2018	2	5	4	4013	2	Cranes	23	2	1	152.4477277	g/vehicle per day
1	2018	2	5	4	4013	2	Cranes	23	3	1	568.8321023	g/vehicle per day
1	2018	2	5	4	4013	2	Cranes	23	79	1	46.72604174	g/vehicle per day
1	2018	2	5	4	4013	2	Cranes	23	87	1	58.15360566	g/vehicle per day
1	2018	2	5	4	4013	2	Cranes	23	100	1	26.66875792	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	3	5	4	4013	2	Cranes	23	1	1	51.72020291	g/vehicle per day
1	2018	3	5	4	4013	2	Cranes	23	2	1	154.2180393	g/vehicle per day
1	2018	3	5	4	4013	2	Cranes	23	3	1	575.437772	g/vehicle per day
1	2018	3	5	4	4013	2	Cranes	23	79	1	47.26866391	g/vehicle per day
1	2018	3	5	4	4013	2	Cranes	23	87	1	58.82895485	g/vehicle per day
1	2018	3	5	4	4013	2	Cranes	23	100	1	26.97845582	g/vehicle per day
1	2018	4	5	4	4013	2	Cranes	23	1	1	53.44420751	g/vehicle per day
1	2018	4	5	4	4013	2	Cranes	23	2	1	159.35866	g/vehicle per day
1	2018	4	5	4	4013	2	Cranes	23	3	1	594.6190994	g/vehicle per day
1	2018	4	5	4	4013	2	Cranes	23	79	1	48.84430991	g/vehicle per day
1	2018	4	5	4	4013	2	Cranes	23	87	1	60.78990101	g/vehicle per day
1	2018	4	5	4	4013	2	Cranes	23	100	1	27.87773962	g/vehicle per day
1	2018	5	5	4	4013	2	Cranes	23	1	1	51.72020291	g/vehicle per day
1	2018	5	5	4	4013	2	Cranes	23	2	1	154.2180393	g/vehicle per day
1	2018	5	5	4	4013	2	Cranes	23	3	1	575.437772	g/vehicle per day
1	2018	5	5	4	4013	2	Cranes	23	79	1	47.26866391	g/vehicle per day
1	2018	5	5	4	4013	2	Cranes	23	87	1	58.82895485	g/vehicle per day
1	2018	5	5	4	4013	2	Cranes	23	100	1	26.97845582	g/vehicle per day
1	2018	6	5	4	4013	2	Cranes	23	1	1	57.89789417	g/vehicle per day
1	2018	6	5	4	4013	2	Cranes	23	2	1	172.6385599	g/vehicle per day
1	2018	6	5	4	4013	2	Cranes	23	3	1	644.1706166	g/vehicle per day
1	2018	6	5	4	4013	2	Cranes	23	79	1	52.91467785	g/vehicle per day
1	2018	6	5	4	4013	2	Cranes	23	87	1	65.85572317	g/vehicle per day
1	2018	6	5	4	4013	2	Cranes	23	100	1	30.20087961	g/vehicle per day
1	2018	7	5	4	4013	2	Cranes	23	1	1	56.03020555	g/vehicle per day
1	2018	7	5	4	4013	2	Cranes	23	2	1	167.0695351	g/vehicle per day
1	2018	7	5	4	4013	2	Cranes	23	3	1	623.3909529	g/vehicle per day
1	2018	7	5	4	4013	2	Cranes	23	79	1	51.20772345	g/vehicle per day
1	2018	7	5	4	4013	2	Cranes	23	87	1	63.7313467	g/vehicle per day
1	2018	7	5	4	4013	2	Cranes	23	100	1	29.22665977	g/vehicle per day
1	2018	8	5	4	4013	2	Cranes	23	1	1	56.03020555	g/vehicle per day
1	2018	8	5	4	4013	2	Cranes	23	2	1	167.0695351	g/vehicle per day
1	2018	8	5	4	4013	2	Cranes	23	3	1	623.3909529	g/vehicle per day
1	2018	8	5	4	4013	2	Cranes	23	79	1	51.20772345	g/vehicle per day
1	2018	8	5	4	4013	2	Cranes	23	87	1	63.7313467	g/vehicle per day
1	2018	8	5	4	4013	2	Cranes	23	100	1	29.22665977	g/vehicle per day
1	2018	9	5	4	4013	2	Cranes	23	1	1	53.44420751	g/vehicle per day
1	2018	9	5	4	4013	2	Cranes	23	2	1	159.35866	g/vehicle per day
1	2018	9	5	4	4013	2	Cranes	23	3	1	594.6190994	g/vehicle per day
1	2018	9	5	4	4013	2	Cranes	23	79	1	48.84430991	g/vehicle per day
1	2018	9	5	4	4013	2	Cranes	23	87	1	60.78990101	g/vehicle per day
1	2018	9	5	4	4013	2	Cranes	23	100	1	27.87773962	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	10	5	4	4013	2	Cranes	23	1	1	51.72020291	g/vehicle per day
1	2018	10	5	4	4013	2	Cranes	23	2	1	154.2180393	g/vehicle per day
1	2018	10	5	4	4013	2	Cranes	23	3	1	575.437772	g/vehicle per day
1	2018	10	5	4	4013	2	Cranes	23	79	1	47.26866391	g/vehicle per day
1	2018	10	5	4	4013	2	Cranes	23	87	1	58.82895485	g/vehicle per day
1	2018	10	5	4	4013	2	Cranes	23	100	1	26.97845582	g/vehicle per day
1	2018	11	5	4	4013	2	Cranes	23	1	1	53.44420751	g/vehicle per day
1	2018	11	5	4	4013	2	Cranes	23	2	1	159.35866	g/vehicle per day
1	2018	11	5	4	4013	2	Cranes	23	3	1	594.6190994	g/vehicle per day
1	2018	11	5	4	4013	2	Cranes	23	79	1	48.84430991	g/vehicle per day
1	2018	11	5	4	4013	2	Cranes	23	87	1	60.78990101	g/vehicle per day
1	2018	11	5	4	4013	2	Cranes	23	100	1	27.87773962	g/vehicle per day
1	2018	12	5	4	4013	2	Cranes	23	1	1	46.17876148	g/vehicle per day
1	2018	12	5	4	4013	2	Cranes	23	2	1	137.6947112	g/vehicle per day
1	2018	12	5	4	4013	2	Cranes	23	3	1	513.7836909	g/vehicle per day
1	2018	12	5	4	4013	2	Cranes	23	79	1	42.20417938	g/vehicle per day
1	2018	12	5	4	4013	2	Cranes	23	87	1	52.52585577	g/vehicle per day
1	2018	12	5	4	4013	2	Cranes	23	100	1	24.08792368	g/vehicle per day
2	2018	1	5	4	4013	2	Cranes	23	1	1	46.17876148	g/vehicle per day
2	2018	1	5	4	4013	2	Cranes	23	2	1	137.6947112	g/vehicle per day
2	2018	1	5	4	4013	2	Cranes	23	3	1	513.7836909	g/vehicle per day
2	2018	1	5	4	4013	2	Cranes	23	79	1	42.20417938	g/vehicle per day
2	2018	1	5	4	4013	2	Cranes	23	87	1	52.52585577	g/vehicle per day
2	2018	1	5	4	4013	2	Cranes	23	100	1	24.08792368	g/vehicle per day
2	2018	2	5	4	4013	2	Cranes	23	1	1	51.12649015	g/vehicle per day
2	2018	2	5	4	4013	2	Cranes	23	2	1	152.4477277	g/vehicle per day
2	2018	2	5	4	4013	2	Cranes	23	3	1	568.8321023	g/vehicle per day
2	2018	2	5	4	4013	2	Cranes	23	79	1	46.72604174	g/vehicle per day
2	2018	2	5	4	4013	2	Cranes	23	87	1	58.15360566	g/vehicle per day
2	2018	2	5	4	4013	2	Cranes	23	100	1	26.66875792	g/vehicle per day
2	2018	3	5	4	4013	2	Cranes	23	1	1	51.72020291	g/vehicle per day
2	2018	3	5	4	4013	2	Cranes	23	2	1	154.2180393	g/vehicle per day
2	2018	3	5	4	4013	2	Cranes	23	3	1	575.437772	g/vehicle per day
2	2018	3	5	4	4013	2	Cranes	23	79	1	47.26866391	g/vehicle per day
2	2018	3	5	4	4013	2	Cranes	23	87	1	58.82895485	g/vehicle per day
2	2018	3	5	4	4013	2	Cranes	23	100	1	26.97845582	g/vehicle per day
2	2018	4	5	4	4013	2	Cranes	23	1	1	53.44420751	g/vehicle per day
2	2018	4	5	4	4013	2	Cranes	23	2	1	159.35866	g/vehicle per day
2	2018	4	5	4	4013	2	Cranes	23	3	1	594.6190994	g/vehicle per day
2	2018	4	5	4	4013	2	Cranes	23	79	1	48.84430991	g/vehicle per day
2	2018	4	5	4	4013	2	Cranes	23	87	1	60.78990101	g/vehicle per day
2	2018	4	5	4	4013	2	Cranes	23	100	1	27.87773962	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	5	5	4	4013	2	Cranes	23	1	1	51.72020291	g/vehicle per day
2	2018	5	5	4	4013	2	Cranes	23	2	1	154.2180393	g/vehicle per day
2	2018	5	5	4	4013	2	Cranes	23	3	1	575.437772	g/vehicle per day
2	2018	5	5	4	4013	2	Cranes	23	79	1	47.26866391	g/vehicle per day
2	2018	5	5	4	4013	2	Cranes	23	87	1	58.82895485	g/vehicle per day
2	2018	5	5	4	4013	2	Cranes	23	100	1	26.97845582	g/vehicle per day
2	2018	6	5	4	4013	2	Cranes	23	1	1	57.89789417	g/vehicle per day
2	2018	6	5	4	4013	2	Cranes	23	2	1	172.6385599	g/vehicle per day
2	2018	6	5	4	4013	2	Cranes	23	3	1	644.1706166	g/vehicle per day
2	2018	6	5	4	4013	2	Cranes	23	79	1	52.91467785	g/vehicle per day
2	2018	6	5	4	4013	2	Cranes	23	87	1	65.85572317	g/vehicle per day
2	2018	6	5	4	4013	2	Cranes	23	100	1	30.20087961	g/vehicle per day
2	2018	7	5	4	4013	2	Cranes	23	1	1	56.03020555	g/vehicle per day
2	2018	7	5	4	4013	2	Cranes	23	2	1	167.0695351	g/vehicle per day
2	2018	7	5	4	4013	2	Cranes	23	3	1	623.3909529	g/vehicle per day
2	2018	7	5	4	4013	2	Cranes	23	79	1	51.20772345	g/vehicle per day
2	2018	7	5	4	4013	2	Cranes	23	87	1	63.7313467	g/vehicle per day
2	2018	7	5	4	4013	2	Cranes	23	100	1	29.22665977	g/vehicle per day
2	2018	8	5	4	4013	2	Cranes	23	1	1	56.03020555	g/vehicle per day
2	2018	8	5	4	4013	2	Cranes	23	2	1	167.0695351	g/vehicle per day
2	2018	8	5	4	4013	2	Cranes	23	3	1	623.3909529	g/vehicle per day
2	2018	8	5	4	4013	2	Cranes	23	79	1	51.20772345	g/vehicle per day
2	2018	8	5	4	4013	2	Cranes	23	87	1	63.7313467	g/vehicle per day
2	2018	8	5	4	4013	2	Cranes	23	100	1	29.22665977	g/vehicle per day
2	2018	9	5	4	4013	2	Cranes	23	1	1	53.44420751	g/vehicle per day
2	2018	9	5	4	4013	2	Cranes	23	2	1	159.35866	g/vehicle per day
2	2018	9	5	4	4013	2	Cranes	23	3	1	594.6190994	g/vehicle per day
2	2018	9	5	4	4013	2	Cranes	23	79	1	48.84430991	g/vehicle per day
2	2018	9	5	4	4013	2	Cranes	23	87	1	60.78990101	g/vehicle per day
2	2018	9	5	4	4013	2	Cranes	23	100	1	27.87773962	g/vehicle per day
2	2018	10	5	4	4013	2	Cranes	23	1	1	51.72020291	g/vehicle per day
2	2018	10	5	4	4013	2	Cranes	23	2	1	154.2180393	g/vehicle per day
2	2018	10	5	4	4013	2	Cranes	23	3	1	575.437772	g/vehicle per day
2	2018	10	5	4	4013	2	Cranes	23	79	1	47.26866391	g/vehicle per day
2	2018	10	5	4	4013	2	Cranes	23	87	1	58.82895485	g/vehicle per day
2	2018	10	5	4	4013	2	Cranes	23	100	1	26.97845582	g/vehicle per day
2	2018	11	5	4	4013	2	Cranes	23	1	1	53.44420751	g/vehicle per day
2	2018	11	5	4	4013	2	Cranes	23	2	1	159.35866	g/vehicle per day
2	2018	11	5	4	4013	2	Cranes	23	3	1	594.6190994	g/vehicle per day
2	2018	11	5	4	4013	2	Cranes	23	79	1	48.84430991	g/vehicle per day
2	2018	11	5	4	4013	2	Cranes	23	87	1	60.78990101	g/vehicle per day
2	2018	11	5	4	4013	2	Cranes	23	100	1	27.87773962	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	12	5	4	4013	2	Cranes	23	1	1	46.17876148	g/vehicle per day
2	2018	12	5	4	4013	2	Cranes	23	2	1	137.6947112	g/vehicle per day
2	2018	12	5	4	4013	2	Cranes	23	3	1	513.7836909	g/vehicle per day
2	2018	12	5	4	4013	2	Cranes	23	79	1	42.20417938	g/vehicle per day
2	2018	12	5	4	4013	2	Cranes	23	87	1	52.52585577	g/vehicle per day
2	2018	12	5	4	4013	2	Cranes	23	100	1	24.08792368	g/vehicle per day
2	2019	1	5	4	4013	2	Cranes	23	1	1	44.30990131	g/vehicle per day
2	2019	1	5	4	4013	2	Cranes	23	2	1	120.3720993	g/vehicle per day
2	2019	1	5	4	4013	2	Cranes	23	3	1	448.1280497	g/vehicle per day
2	2019	1	5	4	4013	2	Cranes	23	79	1	40.39021315	g/vehicle per day
2	2019	1	5	4	4013	2	Cranes	23	87	1	50.65544376	g/vehicle per day
2	2019	1	5	4	4013	2	Cranes	23	100	1	20.72330079	g/vehicle per day
2	2019	2	5	4	4013	2	Cranes	23	1	1	49.0574084	g/vehicle per day
2	2019	2	5	4	4013	2	Cranes	23	2	1	133.269091	g/vehicle per day
2	2019	2	5	4	4013	2	Cranes	23	3	1	496.1417084	g/vehicle per day
2	2019	2	5	4	4013	2	Cranes	23	79	1	44.71776499	g/vehicle per day
2	2019	2	5	4	4013	2	Cranes	23	87	1	56.0828384	g/vehicle per day
2	2019	2	5	4	4013	2	Cranes	23	100	1	22.94365004	g/vehicle per day
2	2019	3	5	4	4013	2	Cranes	23	1	1	49.62708024	g/vehicle per day
2	2019	3	5	4	4013	2	Cranes	23	2	1	134.8167198	g/vehicle per day
2	2019	3	5	4	4013	2	Cranes	23	3	1	501.9029164	g/vehicle per day
2	2019	3	5	4	4013	2	Cranes	23	79	1	45.23703631	g/vehicle per day
2	2019	3	5	4	4013	2	Cranes	23	87	1	56.73408687	g/vehicle per day
2	2019	3	5	4	4013	2	Cranes	23	100	1	23.21009569	g/vehicle per day
2	2019	4	5	4	4013	2	Cranes	23	1	1	51.28132469	g/vehicle per day
2	2019	4	5	4	4013	2	Cranes	23	2	1	139.3106143	g/vehicle per day
2	2019	4	5	4	4013	2	Cranes	23	3	1	518.6332532	g/vehicle per day
2	2019	4	5	4	4013	2	Cranes	23	79	1	46.74493911	g/vehicle per day
2	2019	4	5	4	4013	2	Cranes	23	87	1	58.62522598	g/vehicle per day
2	2019	4	5	4	4013	2	Cranes	23	100	1	23.98376673	g/vehicle per day
2	2019	5	5	4	4013	2	Cranes	23	1	1	49.62708024	g/vehicle per day
2	2019	5	5	4	4013	2	Cranes	23	2	1	134.8167198	g/vehicle per day
2	2019	5	5	4	4013	2	Cranes	23	3	1	501.9029164	g/vehicle per day
2	2019	5	5	4	4013	2	Cranes	23	79	1	45.23703631	g/vehicle per day
2	2019	5	5	4	4013	2	Cranes	23	87	1	56.73408687	g/vehicle per day
2	2019	5	5	4	4013	2	Cranes	23	100	1	23.21009569	g/vehicle per day
2	2019	6	5	4	4013	2	Cranes	23	1	1	55.55478288	g/vehicle per day
2	2019	6	5	4	4013	2	Cranes	23	2	1	150.9198669	g/vehicle per day
2	2019	6	5	4	4013	2	Cranes	23	3	1	561.8527299	g/vehicle per day
2	2019	6	5	4	4013	2	Cranes	23	79	1	50.64038564	g/vehicle per day
2	2019	6	5	4	4013	2	Cranes	23	87	1	63.51068882	g/vehicle per day
2	2019	6	5	4	4013	2	Cranes	23	100	1	25.98240618	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	7	5	4	4013	2	Cranes	23	1	1	53.76266709	g/vehicle per day
2	2019	7	5	4	4013	2	Cranes	23	2	1	146.0514641	g/vehicle per day
2	2019	7	5	4	4013	2	Cranes	23	3	1	543.7283078	g/vehicle per day
2	2019	7	5	4	4013	2	Cranes	23	79	1	49.00678248	g/vehicle per day
2	2019	7	5	4	4013	2	Cranes	23	87	1	61.46190932	g/vehicle per day
2	2019	7	5	4	4013	2	Cranes	23	100	1	25.14426781	g/vehicle per day
2	2019	8	5	4	4013	2	Cranes	23	1	1	53.76266709	g/vehicle per day
2	2019	8	5	4	4013	2	Cranes	23	2	1	146.0514641	g/vehicle per day
2	2019	8	5	4	4013	2	Cranes	23	3	1	543.7283078	g/vehicle per day
2	2019	8	5	4	4013	2	Cranes	23	79	1	49.00678248	g/vehicle per day
2	2019	8	5	4	4013	2	Cranes	23	87	1	61.46190932	g/vehicle per day
2	2019	8	5	4	4013	2	Cranes	23	100	1	25.14426781	g/vehicle per day
2	2019	9	5	4	4013	2	Cranes	23	1	1	51.28132469	g/vehicle per day
2	2019	9	5	4	4013	2	Cranes	23	2	1	139.3106143	g/vehicle per day
2	2019	9	5	4	4013	2	Cranes	23	3	1	518.6332532	g/vehicle per day
2	2019	9	5	4	4013	2	Cranes	23	79	1	46.74493911	g/vehicle per day
2	2019	9	5	4	4013	2	Cranes	23	87	1	58.62522598	g/vehicle per day
2	2019	9	5	4	4013	2	Cranes	23	100	1	23.98376673	g/vehicle per day
2	2019	10	5	4	4013	2	Cranes	23	1	1	49.62708024	g/vehicle per day
2	2019	10	5	4	4013	2	Cranes	23	2	1	134.8167198	g/vehicle per day
2	2019	10	5	4	4013	2	Cranes	23	3	1	501.9029164	g/vehicle per day
2	2019	10	5	4	4013	2	Cranes	23	79	1	45.23703631	g/vehicle per day
2	2019	10	5	4	4013	2	Cranes	23	87	1	56.73408687	g/vehicle per day
2	2019	10	5	4	4013	2	Cranes	23	100	1	23.21009569	g/vehicle per day
2	2019	11	5	4	4013	2	Cranes	23	1	1	51.28132469	g/vehicle per day
2	2019	11	5	4	4013	2	Cranes	23	2	1	139.3106143	g/vehicle per day
2	2019	11	5	4	4013	2	Cranes	23	3	1	518.6332532	g/vehicle per day
2	2019	11	5	4	4013	2	Cranes	23	79	1	46.74493911	g/vehicle per day
2	2019	11	5	4	4013	2	Cranes	23	87	1	58.62522598	g/vehicle per day
2	2019	11	5	4	4013	2	Cranes	23	100	1	23.98376673	g/vehicle per day
2	2019	12	5	4	4013	2	Cranes	23	1	1	44.30990131	g/vehicle per day
2	2019	12	5	4	4013	2	Cranes	23	2	1	120.3720993	g/vehicle per day
2	2019	12	5	4	4013	2	Cranes	23	3	1	448.1280497	g/vehicle per day
2	2019	12	5	4	4013	2	Cranes	23	79	1	40.39021315	g/vehicle per day
2	2019	12	5	4	4013	2	Cranes	23	87	1	50.65544376	g/vehicle per day
2	2019	12	5	4	4013	2	Cranes	23	100	1	20.72330079	g/vehicle per day
2	2017	1	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	67.43437141	g/vehicle per day
2	2017	1	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	322.87475	g/vehicle per day
2	2017	1	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	755.1566145	g/vehicle per day
2	2017	1	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	61.42691449	g/vehicle per day
2	2017	1	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	77.06415319	g/vehicle per day
2	2017	1	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	47.48367513	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	2	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	74.65948515	g/vehicle per day
2	2017	2	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	357.4685603	g/vehicle per day
2	2017	2	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	836.0662725	g/vehicle per day
2	2017	2	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	68.00838001	g/vehicle per day
2	2017	2	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	85.32102902	g/vehicle per day
2	2017	2	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	52.5711994	g/vehicle per day
2	2017	3	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	75.52647993	g/vehicle per day
2	2017	3	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	361.6197788	g/vehicle per day
2	2017	3	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	845.7752209	g/vehicle per day
2	2017	3	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	68.79812325	g/vehicle per day
2	2017	3	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	86.31182837	g/vehicle per day
2	2017	3	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	53.18169481	g/vehicle per day
2	2017	4	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	78.04401746	g/vehicle per day
2	2017	4	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	373.6737156	g/vehicle per day
2	2017	4	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	873.9676438	g/vehicle per day
2	2017	4	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	71.09138918	g/vehicle per day
2	2017	4	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	89.18888963	g/vehicle per day
2	2017	4	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	54.95442311	g/vehicle per day
2	2017	5	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	75.52647993	g/vehicle per day
2	2017	5	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	361.6197788	g/vehicle per day
2	2017	5	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	845.7752209	g/vehicle per day
2	2017	5	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	68.79812325	g/vehicle per day
2	2017	5	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	86.31182837	g/vehicle per day
2	2017	5	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	53.18169481	g/vehicle per day
2	2017	6	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	84.54770905	g/vehicle per day
2	2017	6	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	404.8132017	g/vehicle per day
2	2017	6	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	946.7984876	g/vehicle per day
2	2017	6	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	77.01568548	g/vehicle per day
2	2017	6	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	96.62132095	g/vehicle per day
2	2017	6	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	59.53395628	g/vehicle per day
2	2017	7	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	81.82033279	g/vehicle per day
2	2017	7	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	391.7547433	g/vehicle per day
2	2017	7	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	916.2564083	g/vehicle per day
2	2017	7	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	74.53127169	g/vehicle per day
2	2017	7	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	93.50445489	g/vehicle per day
2	2017	7	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	57.61350988	g/vehicle per day
2	2017	8	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	81.82033279	g/vehicle per day
2	2017	8	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	391.7547433	g/vehicle per day
2	2017	8	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	916.2564083	g/vehicle per day
2	2017	8	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	74.53127169	g/vehicle per day
2	2017	8	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	93.50445489	g/vehicle per day
2	2017	8	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	57.61350988	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	9	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	78.04401746	g/vehicle per day
2	2017	9	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	373.6737156	g/vehicle per day
2	2017	9	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	873.9676438	g/vehicle per day
2	2017	9	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	71.09138918	g/vehicle per day
2	2017	9	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	89.18888963	g/vehicle per day
2	2017	9	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	54.95442311	g/vehicle per day
2	2017	10	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	75.52647993	g/vehicle per day
2	2017	10	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	361.6197788	g/vehicle per day
2	2017	10	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	845.7752209	g/vehicle per day
2	2017	10	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	68.79812325	g/vehicle per day
2	2017	10	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	86.31182837	g/vehicle per day
2	2017	10	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	53.18169481	g/vehicle per day
2	2017	11	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	78.04401746	g/vehicle per day
2	2017	11	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	373.6737156	g/vehicle per day
2	2017	11	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	873.9676438	g/vehicle per day
2	2017	11	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	71.09138918	g/vehicle per day
2	2017	11	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	89.18888963	g/vehicle per day
2	2017	11	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	54.95442311	g/vehicle per day
2	2017	12	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	67.43437141	g/vehicle per day
2	2017	12	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	322.87475	g/vehicle per day
2	2017	12	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	755.1566145	g/vehicle per day
2	2017	12	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	61.42691449	g/vehicle per day
2	2017	12	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	77.06415319	g/vehicle per day
2	2017	12	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	47.48367513	g/vehicle per day
1	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	64.41022047	g/vehicle per day
1	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	274.2947891	g/vehicle per day
1	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	652.5266967	g/vehicle per day
1	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	58.51945137	g/vehicle per day
1	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	74.03801291	g/vehicle per day
1	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	39.15007068	g/vehicle per day
1	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	71.31132737	g/vehicle per day
1	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	303.6833954	g/vehicle per day
1	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	722.4404414	g/vehicle per day
1	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	64.78938808	g/vehicle per day
1	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	81.97066056	g/vehicle per day
1	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	43.34472267	g/vehicle per day
1	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	72.13944336	g/vehicle per day
1	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	307.2099354	g/vehicle per day
1	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	730.8299199	g/vehicle per day
1	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	65.54177733	g/vehicle per day
1	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	82.92257026	g/vehicle per day
1	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	43.84807637	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	74.54407741	g/vehicle per day
1	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	317.4503866	g/vehicle per day
1	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	755.190921	g/vehicle per day
1	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	67.7264714	g/vehicle per day
1	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	85.68663375	g/vehicle per day
1	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	45.30967498	g/vehicle per day
1	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	72.13944336	g/vehicle per day
1	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	307.2099354	g/vehicle per day
1	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	730.8299199	g/vehicle per day
1	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	65.54177733	g/vehicle per day
1	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	82.92257026	g/vehicle per day
1	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	43.84807637	g/vehicle per day
1	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	80.75610322	g/vehicle per day
1	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	343.9045637	g/vehicle per day
1	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	818.1235304	g/vehicle per day
1	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	73.3703619	g/vehicle per day
1	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	92.82720391	g/vehicle per day
1	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	49.0854918	g/vehicle per day
1	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	78.15105645	g/vehicle per day
1	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	332.8108446	g/vehicle per day
1	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	791.7323874	g/vehicle per day
1	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	71.00358316	g/vehicle per day
1	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	89.8327924	g/vehicle per day
1	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	47.5020777	g/vehicle per day
1	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	78.15105645	g/vehicle per day
1	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	332.8108446	g/vehicle per day
1	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	791.7323874	g/vehicle per day
1	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	71.00358316	g/vehicle per day
1	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	89.8327924	g/vehicle per day
1	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	47.5020777	g/vehicle per day
1	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	74.54407741	g/vehicle per day
1	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	317.4503866	g/vehicle per day
1	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	755.190921	g/vehicle per day
1	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	67.7264714	g/vehicle per day
1	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	85.68663375	g/vehicle per day
1	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	45.30967498	g/vehicle per day
1	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	72.13944336	g/vehicle per day
1	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	307.2099354	g/vehicle per day
1	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	730.8299199	g/vehicle per day
1	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	65.54177733	g/vehicle per day
1	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	82.92257026	g/vehicle per day
1	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	43.84807637	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	74.54407741	g/vehicle per day
1	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	317.4503866	g/vehicle per day
1	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	755.190921	g/vehicle per day
1	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	67.7264714	g/vehicle per day
1	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	85.68663375	g/vehicle per day
1	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	45.30967498	g/vehicle per day
1	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	64.41022047	g/vehicle per day
1	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	274.2947891	g/vehicle per day
1	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	652.5266967	g/vehicle per day
1	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	58.51945137	g/vehicle per day
1	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	74.03801291	g/vehicle per day
1	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	39.15007068	g/vehicle per day
2	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	64.41022047	g/vehicle per day
2	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	274.2947891	g/vehicle per day
2	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	652.5266967	g/vehicle per day
2	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	58.51945137	g/vehicle per day
2	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	74.03801291	g/vehicle per day
2	2018	1	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	39.15007068	g/vehicle per day
2	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	71.31132737	g/vehicle per day
2	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	303.6833954	g/vehicle per day
2	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	722.4404414	g/vehicle per day
2	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	64.78938808	g/vehicle per day
2	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	81.97066056	g/vehicle per day
2	2018	2	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	43.34472267	g/vehicle per day
2	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	72.13944336	g/vehicle per day
2	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	307.2099354	g/vehicle per day
2	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	730.8299199	g/vehicle per day
2	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	65.54177733	g/vehicle per day
2	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	82.92257026	g/vehicle per day
2	2018	3	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	43.84807637	g/vehicle per day
2	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	74.54407741	g/vehicle per day
2	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	317.4503866	g/vehicle per day
2	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	755.190921	g/vehicle per day
2	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	67.7264714	g/vehicle per day
2	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	85.68663375	g/vehicle per day
2	2018	4	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	45.30967498	g/vehicle per day
2	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	72.13944336	g/vehicle per day
2	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	307.2099354	g/vehicle per day
2	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	730.8299199	g/vehicle per day
2	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	65.54177733	g/vehicle per day
2	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	82.92257026	g/vehicle per day
2	2018	5	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	43.84807637	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	80.75610322	g/vehicle per day
2	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	343.9045637	g/vehicle per day
2	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	818.1235304	g/vehicle per day
2	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	73.3703619	g/vehicle per day
2	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	92.82720391	g/vehicle per day
2	2018	6	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	49.0854918	g/vehicle per day
2	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	78.15105645	g/vehicle per day
2	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	332.8108446	g/vehicle per day
2	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	791.7323874	g/vehicle per day
2	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	71.00358316	g/vehicle per day
2	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	89.8327924	g/vehicle per day
2	2018	7	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	47.5020777	g/vehicle per day
2	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	78.15105645	g/vehicle per day
2	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	332.8108446	g/vehicle per day
2	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	791.7323874	g/vehicle per day
2	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	71.00358316	g/vehicle per day
2	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	89.8327924	g/vehicle per day
2	2018	8	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	47.5020777	g/vehicle per day
2	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	74.54407741	g/vehicle per day
2	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	317.4503866	g/vehicle per day
2	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	755.190921	g/vehicle per day
2	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	67.7264714	g/vehicle per day
2	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	85.68663375	g/vehicle per day
2	2018	9	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	45.30967498	g/vehicle per day
2	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	72.13944336	g/vehicle per day
2	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	307.2099354	g/vehicle per day
2	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	730.8299199	g/vehicle per day
2	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	65.54177733	g/vehicle per day
2	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	82.92257026	g/vehicle per day
2	2018	10	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	43.84807637	g/vehicle per day
2	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	74.54407741	g/vehicle per day
2	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	317.4503866	g/vehicle per day
2	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	755.190921	g/vehicle per day
2	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	67.7264714	g/vehicle per day
2	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	85.68663375	g/vehicle per day
2	2018	11	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	45.30967498	g/vehicle per day
2	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	64.41022047	g/vehicle per day
2	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	274.2947891	g/vehicle per day
2	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	652.5266967	g/vehicle per day
2	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	58.51945137	g/vehicle per day
2	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	74.03801291	g/vehicle per day
2	2018	12	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	39.15007068	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	1	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	61.91646327	g/vehicle per day
2	2019	1	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	229.1792953	g/vehicle per day
2	2019	1	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	564.3652287	g/vehicle per day
2	2019	1	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	56.14572609	g/vehicle per day
2	2019	1	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	71.55781659	g/vehicle per day
2	2019	1	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	31.12534955	g/vehicle per day
2	2019	2	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	68.55037594	g/vehicle per day
2	2019	2	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	253.7342096	g/vehicle per day
2	2019	2	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	624.8330611	g/vehicle per day
2	2019	2	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	62.16133616	g/vehicle per day
2	2019	2	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	79.22473114	g/vehicle per day
2	2019	2	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	34.46020284	g/vehicle per day
2	2019	3	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	69.34642551	g/vehicle per day
2	2019	3	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	256.6807318	g/vehicle per day
2	2019	3	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	632.0890935	g/vehicle per day
2	2019	3	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	62.88319413	g/vehicle per day
2	2019	3	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	80.14472592	g/vehicle per day
2	2019	3	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	34.86038442	g/vehicle per day
2	2019	4	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	71.65797737	g/vehicle per day
2	2019	4	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	265.2368123	g/vehicle per day
2	2019	4	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	653.1588969	g/vehicle per day
2	2019	4	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	64.97930959	g/vehicle per day
2	2019	4	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	82.81624334	g/vehicle per day
2	2019	4	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	36.02239422	g/vehicle per day
2	2019	5	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	69.34642551	g/vehicle per day
2	2019	5	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	256.6807318	g/vehicle per day
2	2019	5	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	632.0890935	g/vehicle per day
2	2019	5	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	62.88319413	g/vehicle per day
2	2019	5	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	80.14472592	g/vehicle per day
2	2019	5	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	34.86038442	g/vehicle per day
2	2019	6	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	77.62947272	g/vehicle per day
2	2019	6	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	287.3398844	g/vehicle per day
2	2019	6	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	707.5886062	g/vehicle per day
2	2019	6	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	70.39426239	g/vehicle per day
2	2019	6	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	89.71758146	g/vehicle per day
2	2019	6	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	39.02427163	g/vehicle per day
2	2019	7	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	75.12531368	g/vehicle per day
2	2019	7	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	278.0708296	g/vehicle per day
2	2019	7	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	684.7631448	g/vehicle per day
2	2019	7	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	68.12346785	g/vehicle per day
2	2019	7	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	86.82346461	g/vehicle per day
2	2019	7	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	37.76540892	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	8	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	75.12531368	g/vehicle per day
2	2019	8	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	278.0708296	g/vehicle per day
2	2019	8	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	684.7631448	g/vehicle per day
2	2019	8	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	68.12346785	g/vehicle per day
2	2019	8	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	86.82346461	g/vehicle per day
2	2019	8	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	37.76540892	g/vehicle per day
2	2019	9	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	71.65797737	g/vehicle per day
2	2019	9	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	265.2368123	g/vehicle per day
2	2019	9	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	653.1588969	g/vehicle per day
2	2019	9	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	64.97930959	g/vehicle per day
2	2019	9	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	82.81624334	g/vehicle per day
2	2019	9	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	36.02239422	g/vehicle per day
2	2019	10	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	69.34642551	g/vehicle per day
2	2019	10	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	256.6807318	g/vehicle per day
2	2019	10	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	632.0890935	g/vehicle per day
2	2019	10	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	62.88319413	g/vehicle per day
2	2019	10	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	80.14472592	g/vehicle per day
2	2019	10	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	34.86038442	g/vehicle per day
2	2019	11	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	71.65797737	g/vehicle per day
2	2019	11	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	265.2368123	g/vehicle per day
2	2019	11	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	653.1588969	g/vehicle per day
2	2019	11	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	64.97930959	g/vehicle per day
2	2019	11	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	82.81624334	g/vehicle per day
2	2019	11	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	36.02239422	g/vehicle per day
2	2019	12	5	4	4013	2	Crawler Tractor/Dozers	23	1	1	61.91646327	g/vehicle per day
2	2019	12	5	4	4013	2	Crawler Tractor/Dozers	23	2	1	229.1792953	g/vehicle per day
2	2019	12	5	4	4013	2	Crawler Tractor/Dozers	23	3	1	564.3652287	g/vehicle per day
2	2019	12	5	4	4013	2	Crawler Tractor/Dozers	23	79	1	56.14572609	g/vehicle per day
2	2019	12	5	4	4013	2	Crawler Tractor/Dozers	23	87	1	71.55781659	g/vehicle per day
2	2019	12	5	4	4013	2	Crawler Tractor/Dozers	23	100	1	31.12534955	g/vehicle per day
2	2017	1	5	4	4013	2	Dumpers/Tenders	23	1	1	11.7914931	g/vehicle per day
2	2017	1	5	4	4013	2	Dumpers/Tenders	23	2	1	56.06482868	g/vehicle per day
2	2017	1	5	4	4013	2	Dumpers/Tenders	23	3	1	55.49966797	g/vehicle per day
2	2017	1	5	4	4013	2	Dumpers/Tenders	23	79	1	11.43554244	g/vehicle per day
2	2017	1	5	4	4013	2	Dumpers/Tenders	23	87	1	12.68938993	g/vehicle per day
2	2017	1	5	4	4013	2	Dumpers/Tenders	23	100	1	8.411652826	g/vehicle per day
2	2017	2	5	4	4013	2	Dumpers/Tenders	23	1	1	13.05486961	g/vehicle per day
2	2017	2	5	4	4013	2	Dumpers/Tenders	23	2	1	62.07178409	g/vehicle per day
2	2017	2	5	4	4013	2	Dumpers/Tenders	23	3	1	61.44606287	g/vehicle per day
2	2017	2	5	4	4013	2	Dumpers/Tenders	23	79	1	12.66077976	g/vehicle per day
2	2017	2	5	4	4013	2	Dumpers/Tenders	23	87	1	14.04896865	g/vehicle per day
2	2017	2	5	4	4013	2	Dumpers/Tenders	23	100	1	9.312901271	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	3	5	4	4013	2	Dumpers/Tenders	23	1	1	13.20646552	g/vehicle per day
2	2017	3	5	4	4013	2	Dumpers/Tenders	23	2	1	62.79262068	g/vehicle per day
2	2017	3	5	4	4013	2	Dumpers/Tenders	23	3	1	62.15962467	g/vehicle per day
2	2017	3	5	4	4013	2	Dumpers/Tenders	23	79	1	12.80779689	g/vehicle per day
2	2017	3	5	4	4013	2	Dumpers/Tenders	23	87	1	14.21210877	g/vehicle per day
2	2017	3	5	4	4013	2	Dumpers/Tenders	23	100	1	9.4210487	g/vehicle per day
2	2017	4	5	4	4013	2	Dumpers/Tenders	23	1	1	13.64668565	g/vehicle per day
2	2017	4	5	4	4013	2	Dumpers/Tenders	23	2	1	64.88567991	g/vehicle per day
2	2017	4	5	4	4013	2	Dumpers/Tenders	23	3	1	64.23161748	g/vehicle per day
2	2017	4	5	4	4013	2	Dumpers/Tenders	23	79	1	13.23473337	g/vehicle per day
2	2017	4	5	4	4013	2	Dumpers/Tenders	23	87	1	14.68585034	g/vehicle per day
2	2017	4	5	4	4013	2	Dumpers/Tenders	23	100	1	9.735082976	g/vehicle per day
2	2017	5	5	4	4013	2	Dumpers/Tenders	23	1	1	13.20646552	g/vehicle per day
2	2017	5	5	4	4013	2	Dumpers/Tenders	23	2	1	62.79262068	g/vehicle per day
2	2017	5	5	4	4013	2	Dumpers/Tenders	23	3	1	62.15962467	g/vehicle per day
2	2017	5	5	4	4013	2	Dumpers/Tenders	23	79	1	12.80779689	g/vehicle per day
2	2017	5	5	4	4013	2	Dumpers/Tenders	23	87	1	14.21210877	g/vehicle per day
2	2017	5	5	4	4013	2	Dumpers/Tenders	23	100	1	9.4210487	g/vehicle per day
2	2017	6	5	4	4013	2	Dumpers/Tenders	23	1	1	14.78390933	g/vehicle per day
2	2017	6	5	4	4013	2	Dumpers/Tenders	23	2	1	70.29283979	g/vehicle per day
2	2017	6	5	4	4013	2	Dumpers/Tenders	23	3	1	69.58423906	g/vehicle per day
2	2017	6	5	4	4013	2	Dumpers/Tenders	23	79	1	14.33762249	g/vehicle per day
2	2017	6	5	4	4013	2	Dumpers/Tenders	23	87	1	15.9096718	g/vehicle per day
2	2017	6	5	4	4013	2	Dumpers/Tenders	23	100	1	10.54634104	g/vehicle per day
2	2017	7	5	4	4013	2	Dumpers/Tenders	23	1	1	14.30700883	g/vehicle per day
2	2017	7	5	4	4013	2	Dumpers/Tenders	23	2	1	68.02531519	g/vehicle per day
2	2017	7	5	4	4013	2	Dumpers/Tenders	23	3	1	67.33957917	g/vehicle per day
2	2017	7	5	4	4013	2	Dumpers/Tenders	23	79	1	13.87511925	g/vehicle per day
2	2017	7	5	4	4013	2	Dumpers/Tenders	23	87	1	15.39645567	g/vehicle per day
2	2017	7	5	4	4013	2	Dumpers/Tenders	23	100	1	10.2061364	g/vehicle per day
2	2017	8	5	4	4013	2	Dumpers/Tenders	23	1	1	14.30700883	g/vehicle per day
2	2017	8	5	4	4013	2	Dumpers/Tenders	23	2	1	68.02531519	g/vehicle per day
2	2017	8	5	4	4013	2	Dumpers/Tenders	23	3	1	67.33957917	g/vehicle per day
2	2017	8	5	4	4013	2	Dumpers/Tenders	23	79	1	13.87511925	g/vehicle per day
2	2017	8	5	4	4013	2	Dumpers/Tenders	23	87	1	15.39645567	g/vehicle per day
2	2017	8	5	4	4013	2	Dumpers/Tenders	23	100	1	10.2061364	g/vehicle per day
2	2017	9	5	4	4013	2	Dumpers/Tenders	23	1	1	13.64668565	g/vehicle per day
2	2017	9	5	4	4013	2	Dumpers/Tenders	23	2	1	64.88567991	g/vehicle per day
2	2017	9	5	4	4013	2	Dumpers/Tenders	23	3	1	64.23161748	g/vehicle per day
2	2017	9	5	4	4013	2	Dumpers/Tenders	23	79	1	13.23473337	g/vehicle per day
2	2017	9	5	4	4013	2	Dumpers/Tenders	23	87	1	14.68585034	g/vehicle per day
2	2017	9	5	4	4013	2	Dumpers/Tenders	23	100	1	9.735082976	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	10	5	4	4013	2	Dumpers/Tenders	23	1	1	13.20646552	g/vehicle per day
2	2017	10	5	4	4013	2	Dumpers/Tenders	23	2	1	62.79262068	g/vehicle per day
2	2017	10	5	4	4013	2	Dumpers/Tenders	23	3	1	62.15962467	g/vehicle per day
2	2017	10	5	4	4013	2	Dumpers/Tenders	23	79	1	12.80779689	g/vehicle per day
2	2017	10	5	4	4013	2	Dumpers/Tenders	23	87	1	14.21210877	g/vehicle per day
2	2017	10	5	4	4013	2	Dumpers/Tenders	23	100	1	9.4210487	g/vehicle per day
2	2017	11	5	4	4013	2	Dumpers/Tenders	23	1	1	13.64668565	g/vehicle per day
2	2017	11	5	4	4013	2	Dumpers/Tenders	23	2	1	64.88567991	g/vehicle per day
2	2017	11	5	4	4013	2	Dumpers/Tenders	23	3	1	64.23161748	g/vehicle per day
2	2017	11	5	4	4013	2	Dumpers/Tenders	23	79	1	13.23473337	g/vehicle per day
2	2017	11	5	4	4013	2	Dumpers/Tenders	23	87	1	14.68585034	g/vehicle per day
2	2017	11	5	4	4013	2	Dumpers/Tenders	23	100	1	9.735082976	g/vehicle per day
2	2017	12	5	4	4013	2	Dumpers/Tenders	23	1	1	11.7914931	g/vehicle per day
2	2017	12	5	4	4013	2	Dumpers/Tenders	23	2	1	56.06482868	g/vehicle per day
2	2017	12	5	4	4013	2	Dumpers/Tenders	23	3	1	55.49966797	g/vehicle per day
2	2017	12	5	4	4013	2	Dumpers/Tenders	23	79	1	11.43554244	g/vehicle per day
2	2017	12	5	4	4013	2	Dumpers/Tenders	23	87	1	12.68938993	g/vehicle per day
2	2017	12	5	4	4013	2	Dumpers/Tenders	23	100	1	8.411652826	g/vehicle per day
1	2018	1	5	4	4013	2	Dumpers/Tenders	23	1	1	10.78789405	g/vehicle per day
1	2018	1	5	4	4013	2	Dumpers/Tenders	23	2	1	52.15001306	g/vehicle per day
1	2018	1	5	4	4013	2	Dumpers/Tenders	23	3	1	52.90258235	g/vehicle per day
1	2018	1	5	4	4013	2	Dumpers/Tenders	23	79	1	10.43336682	g/vehicle per day
1	2018	1	5	4	4013	2	Dumpers/Tenders	23	87	1	11.63139783	g/vehicle per day
1	2018	1	5	4	4013	2	Dumpers/Tenders	23	100	1	7.772838098	g/vehicle per day
1	2018	2	5	4	4013	2	Dumpers/Tenders	23	1	1	11.94374046	g/vehicle per day
1	2018	2	5	4	4013	2	Dumpers/Tenders	23	2	1	57.73751079	g/vehicle per day
1	2018	2	5	4	4013	2	Dumpers/Tenders	23	3	1	58.57071274	g/vehicle per day
1	2018	2	5	4	4013	2	Dumpers/Tenders	23	79	1	11.5512318	g/vehicle per day
1	2018	2	5	4	4013	2	Dumpers/Tenders	23	87	1	12.87761741	g/vehicle per day
1	2018	2	5	4	4013	2	Dumpers/Tenders	23	100	1	8.605645322	g/vehicle per day
1	2018	3	5	4	4013	2	Dumpers/Tenders	23	1	1	12.08243844	g/vehicle per day
1	2018	3	5	4	4013	2	Dumpers/Tenders	23	2	1	58.40800184	g/vehicle per day
1	2018	3	5	4	4013	2	Dumpers/Tenders	23	3	1	59.2508754	g/vehicle per day
1	2018	3	5	4	4013	2	Dumpers/Tenders	23	79	1	11.68536691	g/vehicle per day
1	2018	3	5	4	4013	2	Dumpers/Tenders	23	87	1	13.02716207	g/vehicle per day
1	2018	3	5	4	4013	2	Dumpers/Tenders	23	100	1	8.705580517	g/vehicle per day
1	2018	4	5	4	4013	2	Dumpers/Tenders	23	1	1	12.48518472	g/vehicle per day
1	2018	4	5	4	4013	2	Dumpers/Tenders	23	2	1	60.35491042	g/vehicle per day
1	2018	4	5	4	4013	2	Dumpers/Tenders	23	3	1	61.22591581	g/vehicle per day
1	2018	4	5	4	4013	2	Dumpers/Tenders	23	79	1	12.07487884	g/vehicle per day
1	2018	4	5	4	4013	2	Dumpers/Tenders	23	87	1	13.46139756	g/vehicle per day
1	2018	4	5	4	4013	2	Dumpers/Tenders	23	100	1	8.995766748	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	5	5	4	4013	2	Dumpers/Tenders	23	1	1	12.08243844	g/vehicle per day
1	2018	5	5	4	4013	2	Dumpers/Tenders	23	2	1	58.40800184	g/vehicle per day
1	2018	5	5	4	4013	2	Dumpers/Tenders	23	3	1	59.2508754	g/vehicle per day
1	2018	5	5	4	4013	2	Dumpers/Tenders	23	79	1	11.68536691	g/vehicle per day
1	2018	5	5	4	4013	2	Dumpers/Tenders	23	87	1	13.02716207	g/vehicle per day
1	2018	5	5	4	4013	2	Dumpers/Tenders	23	100	1	8.705580517	g/vehicle per day
1	2018	6	5	4	4013	2	Dumpers/Tenders	23	1	1	13.52562025	g/vehicle per day
1	2018	6	5	4	4013	2	Dumpers/Tenders	23	2	1	65.38451205	g/vehicle per day
1	2018	6	5	4	4013	2	Dumpers/Tenders	23	3	1	66.32808179	g/vehicle per day
1	2018	6	5	4	4013	2	Dumpers/Tenders	23	79	1	13.08112337	g/vehicle per day
1	2018	6	5	4	4013	2	Dumpers/Tenders	23	87	1	14.58318225	g/vehicle per day
1	2018	6	5	4	4013	2	Dumpers/Tenders	23	100	1	9.745413671	g/vehicle per day
1	2018	7	5	4	4013	2	Dumpers/Tenders	23	1	1	13.08930915	g/vehicle per day
1	2018	7	5	4	4013	2	Dumpers/Tenders	23	2	1	63.27532172	g/vehicle per day
1	2018	7	5	4	4013	2	Dumpers/Tenders	23	3	1	64.18844625	g/vehicle per day
1	2018	7	5	4	4013	2	Dumpers/Tenders	23	79	1	12.65914967	g/vehicle per day
1	2018	7	5	4	4013	2	Dumpers/Tenders	23	87	1	14.11275871	g/vehicle per day
1	2018	7	5	4	4013	2	Dumpers/Tenders	23	100	1	9.431044832	g/vehicle per day
1	2018	8	5	4	4013	2	Dumpers/Tenders	23	1	1	13.08930915	g/vehicle per day
1	2018	8	5	4	4013	2	Dumpers/Tenders	23	2	1	63.27532172	g/vehicle per day
1	2018	8	5	4	4013	2	Dumpers/Tenders	23	3	1	64.18844625	g/vehicle per day
1	2018	8	5	4	4013	2	Dumpers/Tenders	23	79	1	12.65914967	g/vehicle per day
1	2018	8	5	4	4013	2	Dumpers/Tenders	23	87	1	14.11275871	g/vehicle per day
1	2018	8	5	4	4013	2	Dumpers/Tenders	23	100	1	9.431044832	g/vehicle per day
1	2018	9	5	4	4013	2	Dumpers/Tenders	23	1	1	12.48518472	g/vehicle per day
1	2018	9	5	4	4013	2	Dumpers/Tenders	23	2	1	60.35491042	g/vehicle per day
1	2018	9	5	4	4013	2	Dumpers/Tenders	23	3	1	61.22591581	g/vehicle per day
1	2018	9	5	4	4013	2	Dumpers/Tenders	23	79	1	12.07487884	g/vehicle per day
1	2018	9	5	4	4013	2	Dumpers/Tenders	23	87	1	13.46139756	g/vehicle per day
1	2018	9	5	4	4013	2	Dumpers/Tenders	23	100	1	8.995766748	g/vehicle per day
1	2018	10	5	4	4013	2	Dumpers/Tenders	23	1	1	12.08243844	g/vehicle per day
1	2018	10	5	4	4013	2	Dumpers/Tenders	23	2	1	58.40800184	g/vehicle per day
1	2018	10	5	4	4013	2	Dumpers/Tenders	23	3	1	59.2508754	g/vehicle per day
1	2018	10	5	4	4013	2	Dumpers/Tenders	23	79	1	11.68536691	g/vehicle per day
1	2018	10	5	4	4013	2	Dumpers/Tenders	23	87	1	13.02716207	g/vehicle per day
1	2018	10	5	4	4013	2	Dumpers/Tenders	23	100	1	8.705580517	g/vehicle per day
1	2018	11	5	4	4013	2	Dumpers/Tenders	23	1	1	12.48518472	g/vehicle per day
1	2018	11	5	4	4013	2	Dumpers/Tenders	23	2	1	60.35491042	g/vehicle per day
1	2018	11	5	4	4013	2	Dumpers/Tenders	23	3	1	61.22591581	g/vehicle per day
1	2018	11	5	4	4013	2	Dumpers/Tenders	23	79	1	12.07487884	g/vehicle per day
1	2018	11	5	4	4013	2	Dumpers/Tenders	23	87	1	13.46139756	g/vehicle per day
1	2018	11	5	4	4013	2	Dumpers/Tenders	23	100	1	8.995766748	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	12	5	4	4013	2	Dumpers/Tenders	23	1	1	10.78789405	g/vehicle per day
1	2018	12	5	4	4013	2	Dumpers/Tenders	23	2	1	52.15001306	g/vehicle per day
1	2018	12	5	4	4013	2	Dumpers/Tenders	23	3	1	52.90258235	g/vehicle per day
1	2018	12	5	4	4013	2	Dumpers/Tenders	23	79	1	10.43336682	g/vehicle per day
1	2018	12	5	4	4013	2	Dumpers/Tenders	23	87	1	11.63139783	g/vehicle per day
1	2018	12	5	4	4013	2	Dumpers/Tenders	23	100	1	7.772838098	g/vehicle per day
2	2018	1	5	4	4013	2	Dumpers/Tenders	23	1	1	10.78789405	g/vehicle per day
2	2018	1	5	4	4013	2	Dumpers/Tenders	23	2	1	52.15001306	g/vehicle per day
2	2018	1	5	4	4013	2	Dumpers/Tenders	23	3	1	52.90258235	g/vehicle per day
2	2018	1	5	4	4013	2	Dumpers/Tenders	23	79	1	10.43336682	g/vehicle per day
2	2018	1	5	4	4013	2	Dumpers/Tenders	23	87	1	11.63139783	g/vehicle per day
2	2018	1	5	4	4013	2	Dumpers/Tenders	23	100	1	7.772838098	g/vehicle per day
2	2018	2	5	4	4013	2	Dumpers/Tenders	23	1	1	11.94374046	g/vehicle per day
2	2018	2	5	4	4013	2	Dumpers/Tenders	23	2	1	57.73751079	g/vehicle per day
2	2018	2	5	4	4013	2	Dumpers/Tenders	23	3	1	58.57071274	g/vehicle per day
2	2018	2	5	4	4013	2	Dumpers/Tenders	23	79	1	11.5512318	g/vehicle per day
2	2018	2	5	4	4013	2	Dumpers/Tenders	23	87	1	12.87761741	g/vehicle per day
2	2018	2	5	4	4013	2	Dumpers/Tenders	23	100	1	8.605645322	g/vehicle per day
2	2018	3	5	4	4013	2	Dumpers/Tenders	23	1	1	12.08243844	g/vehicle per day
2	2018	3	5	4	4013	2	Dumpers/Tenders	23	2	1	58.40800184	g/vehicle per day
2	2018	3	5	4	4013	2	Dumpers/Tenders	23	3	1	59.2508754	g/vehicle per day
2	2018	3	5	4	4013	2	Dumpers/Tenders	23	79	1	11.68536691	g/vehicle per day
2	2018	3	5	4	4013	2	Dumpers/Tenders	23	87	1	13.02716207	g/vehicle per day
2	2018	3	5	4	4013	2	Dumpers/Tenders	23	100	1	8.705580517	g/vehicle per day
2	2018	4	5	4	4013	2	Dumpers/Tenders	23	1	1	12.48518472	g/vehicle per day
2	2018	4	5	4	4013	2	Dumpers/Tenders	23	2	1	60.35491042	g/vehicle per day
2	2018	4	5	4	4013	2	Dumpers/Tenders	23	3	1	61.22591581	g/vehicle per day
2	2018	4	5	4	4013	2	Dumpers/Tenders	23	79	1	12.07487884	g/vehicle per day
2	2018	4	5	4	4013	2	Dumpers/Tenders	23	87	1	13.46139756	g/vehicle per day
2	2018	4	5	4	4013	2	Dumpers/Tenders	23	100	1	8.995766748	g/vehicle per day
2	2018	5	5	4	4013	2	Dumpers/Tenders	23	1	1	12.08243844	g/vehicle per day
2	2018	5	5	4	4013	2	Dumpers/Tenders	23	2	1	58.40800184	g/vehicle per day
2	2018	5	5	4	4013	2	Dumpers/Tenders	23	3	1	59.2508754	g/vehicle per day
2	2018	5	5	4	4013	2	Dumpers/Tenders	23	79	1	11.68536691	g/vehicle per day
2	2018	5	5	4	4013	2	Dumpers/Tenders	23	87	1	13.02716207	g/vehicle per day
2	2018	5	5	4	4013	2	Dumpers/Tenders	23	100	1	8.705580517	g/vehicle per day
2	2018	6	5	4	4013	2	Dumpers/Tenders	23	1	1	13.52562025	g/vehicle per day
2	2018	6	5	4	4013	2	Dumpers/Tenders	23	2	1	65.38451205	g/vehicle per day
2	2018	6	5	4	4013	2	Dumpers/Tenders	23	3	1	66.32808179	g/vehicle per day
2	2018	6	5	4	4013	2	Dumpers/Tenders	23	79	1	13.08112337	g/vehicle per day
2	2018	6	5	4	4013	2	Dumpers/Tenders	23	87	1	14.58318225	g/vehicle per day
2	2018	6	5	4	4013	2	Dumpers/Tenders	23	100	1	9.745413671	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	7	5	4	4013	2	Dumpers/Tenders	23	1	1	13.08930915	g/vehicle per day
2	2018	7	5	4	4013	2	Dumpers/Tenders	23	2	1	63.27532172	g/vehicle per day
2	2018	7	5	4	4013	2	Dumpers/Tenders	23	3	1	64.18844625	g/vehicle per day
2	2018	7	5	4	4013	2	Dumpers/Tenders	23	79	1	12.65914967	g/vehicle per day
2	2018	7	5	4	4013	2	Dumpers/Tenders	23	87	1	14.11275871	g/vehicle per day
2	2018	7	5	4	4013	2	Dumpers/Tenders	23	100	1	9.431044832	g/vehicle per day
2	2018	8	5	4	4013	2	Dumpers/Tenders	23	1	1	13.08930915	g/vehicle per day
2	2018	8	5	4	4013	2	Dumpers/Tenders	23	2	1	63.27532172	g/vehicle per day
2	2018	8	5	4	4013	2	Dumpers/Tenders	23	3	1	64.18844625	g/vehicle per day
2	2018	8	5	4	4013	2	Dumpers/Tenders	23	79	1	12.65914967	g/vehicle per day
2	2018	8	5	4	4013	2	Dumpers/Tenders	23	87	1	14.11275871	g/vehicle per day
2	2018	8	5	4	4013	2	Dumpers/Tenders	23	100	1	9.431044832	g/vehicle per day
2	2018	9	5	4	4013	2	Dumpers/Tenders	23	1	1	12.48518472	g/vehicle per day
2	2018	9	5	4	4013	2	Dumpers/Tenders	23	2	1	60.35491042	g/vehicle per day
2	2018	9	5	4	4013	2	Dumpers/Tenders	23	3	1	61.22591581	g/vehicle per day
2	2018	9	5	4	4013	2	Dumpers/Tenders	23	79	1	12.07487884	g/vehicle per day
2	2018	9	5	4	4013	2	Dumpers/Tenders	23	87	1	13.46139756	g/vehicle per day
2	2018	9	5	4	4013	2	Dumpers/Tenders	23	100	1	8.995766748	g/vehicle per day
2	2018	10	5	4	4013	2	Dumpers/Tenders	23	1	1	12.08243844	g/vehicle per day
2	2018	10	5	4	4013	2	Dumpers/Tenders	23	2	1	58.40800184	g/vehicle per day
2	2018	10	5	4	4013	2	Dumpers/Tenders	23	3	1	59.2508754	g/vehicle per day
2	2018	10	5	4	4013	2	Dumpers/Tenders	23	79	1	11.68536691	g/vehicle per day
2	2018	10	5	4	4013	2	Dumpers/Tenders	23	87	1	13.02716207	g/vehicle per day
2	2018	10	5	4	4013	2	Dumpers/Tenders	23	100	1	8.705580517	g/vehicle per day
2	2018	11	5	4	4013	2	Dumpers/Tenders	23	1	1	12.48518472	g/vehicle per day
2	2018	11	5	4	4013	2	Dumpers/Tenders	23	2	1	60.35491042	g/vehicle per day
2	2018	11	5	4	4013	2	Dumpers/Tenders	23	3	1	61.22591581	g/vehicle per day
2	2018	11	5	4	4013	2	Dumpers/Tenders	23	79	1	12.07487884	g/vehicle per day
2	2018	11	5	4	4013	2	Dumpers/Tenders	23	87	1	13.46139756	g/vehicle per day
2	2018	11	5	4	4013	2	Dumpers/Tenders	23	100	1	8.995766748	g/vehicle per day
2	2018	12	5	4	4013	2	Dumpers/Tenders	23	1	1	10.78789405	g/vehicle per day
2	2018	12	5	4	4013	2	Dumpers/Tenders	23	2	1	52.15001306	g/vehicle per day
2	2018	12	5	4	4013	2	Dumpers/Tenders	23	3	1	52.90258235	g/vehicle per day
2	2018	12	5	4	4013	2	Dumpers/Tenders	23	79	1	10.43336682	g/vehicle per day
2	2018	12	5	4	4013	2	Dumpers/Tenders	23	87	1	11.63139783	g/vehicle per day
2	2018	12	5	4	4013	2	Dumpers/Tenders	23	100	1	7.772838098	g/vehicle per day
2	2019	1	5	4	4013	2	Dumpers/Tenders	23	1	1	9.830634603	g/vehicle per day
2	2019	1	5	4	4013	2	Dumpers/Tenders	23	2	1	48.37563138	g/vehicle per day
2	2019	1	5	4	4013	2	Dumpers/Tenders	23	3	1	50.41108878	g/vehicle per day
2	2019	1	5	4	4013	2	Dumpers/Tenders	23	79	1	9.477642132	g/vehicle per day
2	2019	1	5	4	4013	2	Dumpers/Tenders	23	87	1	10.6220573	g/vehicle per day
2	2019	1	5	4	4013	2	Dumpers/Tenders	23	100	1	7.154698361	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	2	5	4	4013	2	Dumpers/Tenders	23	1	1	10.88392144	g/vehicle per day
2	2019	2	5	4	4013	2	Dumpers/Tenders	23	2	1	53.55872435	g/vehicle per day
2	2019	2	5	4	4013	2	Dumpers/Tenders	23	3	1	55.81228253	g/vehicle per day
2	2019	2	5	4	4013	2	Dumpers/Tenders	23	79	1	10.49310869	g/vehicle per day
2	2019	2	5	4	4013	2	Dumpers/Tenders	23	87	1	11.76014001	g/vehicle per day
2	2019	2	5	4	4013	2	Dumpers/Tenders	23	100	1	7.921272084	g/vehicle per day
2	2019	3	5	4	4013	2	Dumpers/Tenders	23	1	1	11.01031151	g/vehicle per day
2	2019	3	5	4	4013	2	Dumpers/Tenders	23	2	1	54.18068678	g/vehicle per day
2	2019	3	5	4	4013	2	Dumpers/Tenders	23	3	1	56.46041265	g/vehicle per day
2	2019	3	5	4	4013	2	Dumpers/Tenders	23	79	1	10.61496192	g/vehicle per day
2	2019	3	5	4	4013	2	Dumpers/Tenders	23	87	1	11.89670391	g/vehicle per day
2	2019	3	5	4	4013	2	Dumpers/Tenders	23	100	1	8.013259808	g/vehicle per day
2	2019	4	5	4	4013	2	Dumpers/Tenders	23	1	1	11.37732246	g/vehicle per day
2	2019	4	5	4	4013	2	Dumpers/Tenders	23	2	1	55.9867055	g/vehicle per day
2	2019	4	5	4	4013	2	Dumpers/Tenders	23	3	1	58.34242649	g/vehicle per day
2	2019	4	5	4	4013	2	Dumpers/Tenders	23	79	1	10.96879128	g/vehicle per day
2	2019	4	5	4	4013	2	Dumpers/Tenders	23	87	1	12.29326215	g/vehicle per day
2	2019	4	5	4	4013	2	Dumpers/Tenders	23	100	1	8.280369241	g/vehicle per day
2	2019	5	5	4	4013	2	Dumpers/Tenders	23	1	1	11.01031151	g/vehicle per day
2	2019	5	5	4	4013	2	Dumpers/Tenders	23	2	1	54.18068678	g/vehicle per day
2	2019	5	5	4	4013	2	Dumpers/Tenders	23	3	1	56.46041265	g/vehicle per day
2	2019	5	5	4	4013	2	Dumpers/Tenders	23	79	1	10.61496192	g/vehicle per day
2	2019	5	5	4	4013	2	Dumpers/Tenders	23	87	1	11.89670391	g/vehicle per day
2	2019	5	5	4	4013	2	Dumpers/Tenders	23	100	1	8.013259808	g/vehicle per day
2	2019	6	5	4	4013	2	Dumpers/Tenders	23	1	1	12.32543203	g/vehicle per day
2	2019	6	5	4	4013	2	Dumpers/Tenders	23	2	1	60.6522639	g/vehicle per day
2	2019	6	5	4	4013	2	Dumpers/Tenders	23	3	1	63.20429238	g/vehicle per day
2	2019	6	5	4	4013	2	Dumpers/Tenders	23	79	1	11.88285846	g/vehicle per day
2	2019	6	5	4	4013	2	Dumpers/Tenders	23	87	1	13.31769789	g/vehicle per day
2	2019	6	5	4	4013	2	Dumpers/Tenders	23	100	1	8.970400902	g/vehicle per day
2	2019	7	5	4	4013	2	Dumpers/Tenders	23	1	1	11.92783554	g/vehicle per day
2	2019	7	5	4	4013	2	Dumpers/Tenders	23	2	1	58.69573736	g/vehicle per day
2	2019	7	5	4	4013	2	Dumpers/Tenders	23	3	1	61.16545636	g/vehicle per day
2	2019	7	5	4	4013	2	Dumpers/Tenders	23	79	1	11.49953714	g/vehicle per day
2	2019	7	5	4	4013	2	Dumpers/Tenders	23	87	1	12.88809318	g/vehicle per day
2	2019	7	5	4	4013	2	Dumpers/Tenders	23	100	1	8.681032559	g/vehicle per day
2	2019	8	5	4	4013	2	Dumpers/Tenders	23	1	1	11.92783554	g/vehicle per day
2	2019	8	5	4	4013	2	Dumpers/Tenders	23	2	1	58.69573736	g/vehicle per day
2	2019	8	5	4	4013	2	Dumpers/Tenders	23	3	1	61.16545636	g/vehicle per day
2	2019	8	5	4	4013	2	Dumpers/Tenders	23	79	1	11.49953714	g/vehicle per day
2	2019	8	5	4	4013	2	Dumpers/Tenders	23	87	1	12.88809318	g/vehicle per day
2	2019	8	5	4	4013	2	Dumpers/Tenders	23	100	1	8.681032559	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	9	5	4	4013	2	Dumpers/Tenders	23	1	1	11.37732246	g/vehicle per day
2	2019	9	5	4	4013	2	Dumpers/Tenders	23	2	1	55.9867055	g/vehicle per day
2	2019	9	5	4	4013	2	Dumpers/Tenders	23	3	1	58.34242649	g/vehicle per day
2	2019	9	5	4	4013	2	Dumpers/Tenders	23	79	1	10.96879128	g/vehicle per day
2	2019	9	5	4	4013	2	Dumpers/Tenders	23	87	1	12.29326215	g/vehicle per day
2	2019	9	5	4	4013	2	Dumpers/Tenders	23	100	1	8.280369241	g/vehicle per day
2	2019	10	5	4	4013	2	Dumpers/Tenders	23	1	1	11.01031151	g/vehicle per day
2	2019	10	5	4	4013	2	Dumpers/Tenders	23	2	1	54.18068678	g/vehicle per day
2	2019	10	5	4	4013	2	Dumpers/Tenders	23	3	1	56.46041265	g/vehicle per day
2	2019	10	5	4	4013	2	Dumpers/Tenders	23	79	1	10.61496192	g/vehicle per day
2	2019	10	5	4	4013	2	Dumpers/Tenders	23	87	1	11.89670391	g/vehicle per day
2	2019	10	5	4	4013	2	Dumpers/Tenders	23	100	1	8.013259808	g/vehicle per day
2	2019	11	5	4	4013	2	Dumpers/Tenders	23	1	1	11.37732246	g/vehicle per day
2	2019	11	5	4	4013	2	Dumpers/Tenders	23	2	1	55.9867055	g/vehicle per day
2	2019	11	5	4	4013	2	Dumpers/Tenders	23	3	1	58.34242649	g/vehicle per day
2	2019	11	5	4	4013	2	Dumpers/Tenders	23	79	1	10.96879128	g/vehicle per day
2	2019	11	5	4	4013	2	Dumpers/Tenders	23	87	1	12.29326215	g/vehicle per day
2	2019	11	5	4	4013	2	Dumpers/Tenders	23	100	1	8.280369241	g/vehicle per day
2	2019	12	5	4	4013	2	Dumpers/Tenders	23	1	1	9.830634603	g/vehicle per day
2	2019	12	5	4	4013	2	Dumpers/Tenders	23	2	1	48.37563138	g/vehicle per day
2	2019	12	5	4	4013	2	Dumpers/Tenders	23	3	1	50.41108878	g/vehicle per day
2	2019	12	5	4	4013	2	Dumpers/Tenders	23	79	1	9.477642132	g/vehicle per day
2	2019	12	5	4	4013	2	Dumpers/Tenders	23	87	1	10.6220573	g/vehicle per day
2	2019	12	5	4	4013	2	Dumpers/Tenders	23	100	1	7.154698361	g/vehicle per day
2	2017	1	5	4	4013	2	Excavators	23	1	1	47.39059077	g/vehicle per day
2	2017	1	5	4	4013	2	Excavators	23	2	1	168.6861518	g/vehicle per day
2	2017	1	5	4	4013	2	Excavators	23	3	1	423.5679753	g/vehicle per day
2	2017	1	5	4	4013	2	Excavators	23	79	1	42.85114073	g/vehicle per day
2	2017	1	5	4	4013	2	Excavators	23	87	1	54.63292283	g/vehicle per day
2	2017	1	5	4	4013	2	Excavators	23	100	1	28.62000107	g/vehicle per day
2	2017	2	5	4	4013	2	Excavators	23	1	1	52.46814604	g/vehicle per day
2	2017	2	5	4	4013	2	Excavators	23	2	1	186.7597524	g/vehicle per day
2	2017	2	5	4	4013	2	Excavators	23	3	1	468.9500128	g/vehicle per day
2	2017	2	5	4	4013	2	Excavators	23	79	1	47.44231782	g/vehicle per day
2	2017	2	5	4	4013	2	Excavators	23	87	1	60.48645082	g/vehicle per day
2	2017	2	5	4	4013	2	Excavators	23	100	1	31.68643893	g/vehicle per day
2	2017	3	5	4	4013	2	Excavators	23	1	1	53.07744462	g/vehicle per day
2	2017	3	5	4	4013	2	Excavators	23	2	1	188.9284642	g/vehicle per day
2	2017	3	5	4	4013	2	Excavators	23	3	1	474.3957293	g/vehicle per day
2	2017	3	5	4	4013	2	Excavators	23	79	1	47.99325441	g/vehicle per day
2	2017	3	5	4	4013	2	Excavators	23	87	1	61.18887309	g/vehicle per day
2	2017	3	5	4	4013	2	Excavators	23	100	1	32.05442586	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	4	5	4	4013	2	Excavators	23	1	1	54.84671097	g/vehicle per day
2	2017	4	5	4	4013	2	Excavators	23	2	1	195.226102	g/vehicle per day
2	2017	4	5	4	4013	2	Excavators	23	3	1	490.2090243	g/vehicle per day
2	2017	4	5	4	4013	2	Excavators	23	79	1	49.59305153	g/vehicle per day
2	2017	4	5	4	4013	2	Excavators	23	87	1	63.22853113	g/vehicle per day
2	2017	4	5	4	4013	2	Excavators	23	100	1	33.12285903	g/vehicle per day
2	2017	5	5	4	4013	2	Excavators	23	1	1	53.07744462	g/vehicle per day
2	2017	5	5	4	4013	2	Excavators	23	2	1	188.9284642	g/vehicle per day
2	2017	5	5	4	4013	2	Excavators	23	3	1	474.3957293	g/vehicle per day
2	2017	5	5	4	4013	2	Excavators	23	79	1	47.99325441	g/vehicle per day
2	2017	5	5	4	4013	2	Excavators	23	87	1	61.18887309	g/vehicle per day
2	2017	5	5	4	4013	2	Excavators	23	100	1	32.05442586	g/vehicle per day
2	2017	6	5	4	4013	2	Excavators	23	1	1	59.41725169	g/vehicle per day
2	2017	6	5	4	4013	2	Excavators	23	2	1	211.4949565	g/vehicle per day
2	2017	6	5	4	4013	2	Excavators	23	3	1	531.059832	g/vehicle per day
2	2017	6	5	4	4013	2	Excavators	23	79	1	53.72578183	g/vehicle per day
2	2017	6	5	4	4013	2	Excavators	23	87	1	68.49755501	g/vehicle per day
2	2017	6	5	4	4013	2	Excavators	23	100	1	35.88310108	g/vehicle per day
2	2017	7	5	4	4013	2	Excavators	23	1	1	57.50054484	g/vehicle per day
2	2017	7	5	4	4013	2	Excavators	23	2	1	204.6725548	g/vehicle per day
2	2017	7	5	4	4013	2	Excavators	23	3	1	513.928676	g/vehicle per day
2	2017	7	5	4	4013	2	Excavators	23	79	1	51.99267361	g/vehicle per day
2	2017	7	5	4	4013	2	Excavators	23	87	1	66.28792099	g/vehicle per day
2	2017	7	5	4	4013	2	Excavators	23	100	1	34.72559804	g/vehicle per day
2	2017	8	5	4	4013	2	Excavators	23	1	1	57.50054484	g/vehicle per day
2	2017	8	5	4	4013	2	Excavators	23	2	1	204.6725548	g/vehicle per day
2	2017	8	5	4	4013	2	Excavators	23	3	1	513.928676	g/vehicle per day
2	2017	8	5	4	4013	2	Excavators	23	79	1	51.99267361	g/vehicle per day
2	2017	8	5	4	4013	2	Excavators	23	87	1	66.28792099	g/vehicle per day
2	2017	8	5	4	4013	2	Excavators	23	100	1	34.72559804	g/vehicle per day
2	2017	9	5	4	4013	2	Excavators	23	1	1	54.84671097	g/vehicle per day
2	2017	9	5	4	4013	2	Excavators	23	2	1	195.226102	g/vehicle per day
2	2017	9	5	4	4013	2	Excavators	23	3	1	490.2090243	g/vehicle per day
2	2017	9	5	4	4013	2	Excavators	23	79	1	49.59305153	g/vehicle per day
2	2017	9	5	4	4013	2	Excavators	23	87	1	63.22853113	g/vehicle per day
2	2017	9	5	4	4013	2	Excavators	23	100	1	33.12285903	g/vehicle per day
2	2017	10	5	4	4013	2	Excavators	23	1	1	53.07744462	g/vehicle per day
2	2017	10	5	4	4013	2	Excavators	23	2	1	188.9284642	g/vehicle per day
2	2017	10	5	4	4013	2	Excavators	23	3	1	474.3957293	g/vehicle per day
2	2017	10	5	4	4013	2	Excavators	23	79	1	47.99325441	g/vehicle per day
2	2017	10	5	4	4013	2	Excavators	23	87	1	61.18887309	g/vehicle per day
2	2017	10	5	4	4013	2	Excavators	23	100	1	32.05442586	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	11	5	4	4013	2	Excavators	23	1	1	54.84671097	g/vehicle per day
2	2017	11	5	4	4013	2	Excavators	23	2	1	195.226102	g/vehicle per day
2	2017	11	5	4	4013	2	Excavators	23	3	1	490.2090243	g/vehicle per day
2	2017	11	5	4	4013	2	Excavators	23	79	1	49.59305153	g/vehicle per day
2	2017	11	5	4	4013	2	Excavators	23	87	1	63.22853113	g/vehicle per day
2	2017	11	5	4	4013	2	Excavators	23	100	1	33.12285903	g/vehicle per day
2	2017	12	5	4	4013	2	Excavators	23	1	1	47.39059077	g/vehicle per day
2	2017	12	5	4	4013	2	Excavators	23	2	1	168.6861518	g/vehicle per day
2	2017	12	5	4	4013	2	Excavators	23	3	1	423.5679753	g/vehicle per day
2	2017	12	5	4	4013	2	Excavators	23	79	1	42.85114073	g/vehicle per day
2	2017	12	5	4	4013	2	Excavators	23	87	1	54.63292283	g/vehicle per day
2	2017	12	5	4	4013	2	Excavators	23	100	1	28.62000107	g/vehicle per day
1	2018	1	5	4	4013	2	Excavators	23	1	1	45.3709524	g/vehicle per day
1	2018	1	5	4	4013	2	Excavators	23	2	1	130.8552579	g/vehicle per day
1	2018	1	5	4	4013	2	Excavators	23	3	1	348.478046	g/vehicle per day
1	2018	1	5	4	4013	2	Excavators	23	79	1	40.99348953	g/vehicle per day
1	2018	1	5	4	4013	2	Excavators	23	87	1	52.62033254	g/vehicle per day
1	2018	1	5	4	4013	2	Excavators	23	100	1	20.46547671	g/vehicle per day
1	2018	2	5	4	4013	2	Excavators	23	1	1	50.2321326	g/vehicle per day
1	2018	2	5	4	4013	2	Excavators	23	2	1	144.8754825	g/vehicle per day
1	2018	2	5	4	4013	2	Excavators	23	3	1	385.8150317	g/vehicle per day
1	2018	2	5	4	4013	2	Excavators	23	79	1	45.38566131	g/vehicle per day
1	2018	2	5	4	4013	2	Excavators	23	87	1	58.25818712	g/vehicle per day
1	2018	2	5	4	4013	2	Excavators	23	100	1	22.65819106	g/vehicle per day
1	2018	3	5	4	4013	2	Excavators	23	1	1	50.81545577	g/vehicle per day
1	2018	3	5	4	4013	2	Excavators	23	2	1	146.5578391	g/vehicle per day
1	2018	3	5	4	4013	2	Excavators	23	3	1	390.2952471	g/vehicle per day
1	2018	3	5	4	4013	2	Excavators	23	79	1	45.91269763	g/vehicle per day
1	2018	3	5	4	4013	2	Excavators	23	87	1	58.93472148	g/vehicle per day
1	2018	3	5	4	4013	2	Excavators	23	100	1	22.92131212	g/vehicle per day
1	2018	4	5	4	4013	2	Excavators	23	1	1	52.50932415	g/vehicle per day
1	2018	4	5	4	4013	2	Excavators	23	2	1	151.4431692	g/vehicle per day
1	2018	4	5	4	4013	2	Excavators	23	3	1	403.3051512	g/vehicle per day
1	2018	4	5	4	4013	2	Excavators	23	79	1	47.44314393	g/vehicle per day
1	2018	4	5	4	4013	2	Excavators	23	87	1	60.89921916	g/vehicle per day
1	2018	4	5	4	4013	2	Excavators	23	100	1	23.68534916	g/vehicle per day
1	2018	5	5	4	4013	2	Excavators	23	1	1	50.81545577	g/vehicle per day
1	2018	5	5	4	4013	2	Excavators	23	2	1	146.5578391	g/vehicle per day
1	2018	5	5	4	4013	2	Excavators	23	3	1	390.2952471	g/vehicle per day
1	2018	5	5	4	4013	2	Excavators	23	79	1	45.91269763	g/vehicle per day
1	2018	5	5	4	4013	2	Excavators	23	87	1	58.93472148	g/vehicle per day
1	2018	5	5	4	4013	2	Excavators	23	100	1	22.92131212	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	6	5	4	4013	2	Excavators	23	1	1	56.88507593	g/vehicle per day
1	2018	6	5	4	4013	2	Excavators	23	2	1	164.0634572	g/vehicle per day
1	2018	6	5	4	4013	2	Excavators	23	3	1	436.9140707	g/vehicle per day
1	2018	6	5	4	4013	2	Excavators	23	79	1	51.39671213	g/vehicle per day
1	2018	6	5	4	4013	2	Excavators	23	87	1	65.97415631	g/vehicle per day
1	2018	6	5	4	4013	2	Excavators	23	100	1	25.65912815	g/vehicle per day
1	2018	7	5	4	4013	2	Excavators	23	1	1	55.05008362	g/vehicle per day
1	2018	7	5	4	4013	2	Excavators	23	2	1	158.770999	g/vehicle per day
1	2018	7	5	4	4013	2	Excavators	23	3	1	422.8199218	g/vehicle per day
1	2018	7	5	4	4013	2	Excavators	23	79	1	49.73875882	g/vehicle per day
1	2018	7	5	4	4013	2	Excavators	23	87	1	63.84597651	g/vehicle per day
1	2018	7	5	4	4013	2	Excavators	23	100	1	24.83141853	g/vehicle per day
1	2018	8	5	4	4013	2	Excavators	23	1	1	55.05008362	g/vehicle per day
1	2018	8	5	4	4013	2	Excavators	23	2	1	158.770999	g/vehicle per day
1	2018	8	5	4	4013	2	Excavators	23	3	1	422.8199218	g/vehicle per day
1	2018	8	5	4	4013	2	Excavators	23	79	1	49.73875882	g/vehicle per day
1	2018	8	5	4	4013	2	Excavators	23	87	1	63.84597651	g/vehicle per day
1	2018	8	5	4	4013	2	Excavators	23	100	1	24.83141853	g/vehicle per day
1	2018	9	5	4	4013	2	Excavators	23	1	1	52.50932415	g/vehicle per day
1	2018	9	5	4	4013	2	Excavators	23	2	1	151.4431692	g/vehicle per day
1	2018	9	5	4	4013	2	Excavators	23	3	1	403.3051512	g/vehicle per day
1	2018	9	5	4	4013	2	Excavators	23	79	1	47.44314393	g/vehicle per day
1	2018	9	5	4	4013	2	Excavators	23	87	1	60.89921916	g/vehicle per day
1	2018	9	5	4	4013	2	Excavators	23	100	1	23.68534916	g/vehicle per day
1	2018	10	5	4	4013	2	Excavators	23	1	1	50.81545577	g/vehicle per day
1	2018	10	5	4	4013	2	Excavators	23	2	1	146.5578391	g/vehicle per day
1	2018	10	5	4	4013	2	Excavators	23	3	1	390.2952471	g/vehicle per day
1	2018	10	5	4	4013	2	Excavators	23	79	1	45.91269763	g/vehicle per day
1	2018	10	5	4	4013	2	Excavators	23	87	1	58.93472148	g/vehicle per day
1	2018	10	5	4	4013	2	Excavators	23	100	1	22.92131212	g/vehicle per day
1	2018	11	5	4	4013	2	Excavators	23	1	1	52.50932415	g/vehicle per day
1	2018	11	5	4	4013	2	Excavators	23	2	1	151.4431692	g/vehicle per day
1	2018	11	5	4	4013	2	Excavators	23	3	1	403.3051512	g/vehicle per day
1	2018	11	5	4	4013	2	Excavators	23	79	1	47.44314393	g/vehicle per day
1	2018	11	5	4	4013	2	Excavators	23	87	1	60.89921916	g/vehicle per day
1	2018	11	5	4	4013	2	Excavators	23	100	1	23.68534916	g/vehicle per day
1	2018	12	5	4	4013	2	Excavators	23	1	1	45.3709524	g/vehicle per day
1	2018	12	5	4	4013	2	Excavators	23	2	1	130.8552579	g/vehicle per day
1	2018	12	5	4	4013	2	Excavators	23	3	1	348.478046	g/vehicle per day
1	2018	12	5	4	4013	2	Excavators	23	79	1	40.99348953	g/vehicle per day
1	2018	12	5	4	4013	2	Excavators	23	87	1	52.62033254	g/vehicle per day
1	2018	12	5	4	4013	2	Excavators	23	100	1	20.46547671	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	1	5	4	4013	2	Excavators	23	1	1	45.3709524	g/vehicle per day
2	2018	1	5	4	4013	2	Excavators	23	2	1	130.8552579	g/vehicle per day
2	2018	1	5	4	4013	2	Excavators	23	3	1	348.478046	g/vehicle per day
2	2018	1	5	4	4013	2	Excavators	23	79	1	40.99348953	g/vehicle per day
2	2018	1	5	4	4013	2	Excavators	23	87	1	52.62033254	g/vehicle per day
2	2018	1	5	4	4013	2	Excavators	23	100	1	20.46547671	g/vehicle per day
2	2018	2	5	4	4013	2	Excavators	23	1	1	50.2321326	g/vehicle per day
2	2018	2	5	4	4013	2	Excavators	23	2	1	144.8754825	g/vehicle per day
2	2018	2	5	4	4013	2	Excavators	23	3	1	385.8150317	g/vehicle per day
2	2018	2	5	4	4013	2	Excavators	23	79	1	45.38566131	g/vehicle per day
2	2018	2	5	4	4013	2	Excavators	23	87	1	58.25818712	g/vehicle per day
2	2018	2	5	4	4013	2	Excavators	23	100	1	22.65819106	g/vehicle per day
2	2018	3	5	4	4013	2	Excavators	23	1	1	50.81545577	g/vehicle per day
2	2018	3	5	4	4013	2	Excavators	23	2	1	146.5578391	g/vehicle per day
2	2018	3	5	4	4013	2	Excavators	23	3	1	390.2952471	g/vehicle per day
2	2018	3	5	4	4013	2	Excavators	23	79	1	45.91269763	g/vehicle per day
2	2018	3	5	4	4013	2	Excavators	23	87	1	58.93472148	g/vehicle per day
2	2018	3	5	4	4013	2	Excavators	23	100	1	22.92131212	g/vehicle per day
2	2018	4	5	4	4013	2	Excavators	23	1	1	52.50932415	g/vehicle per day
2	2018	4	5	4	4013	2	Excavators	23	2	1	151.4431692	g/vehicle per day
2	2018	4	5	4	4013	2	Excavators	23	3	1	403.3051512	g/vehicle per day
2	2018	4	5	4	4013	2	Excavators	23	79	1	47.44314393	g/vehicle per day
2	2018	4	5	4	4013	2	Excavators	23	87	1	60.89921916	g/vehicle per day
2	2018	4	5	4	4013	2	Excavators	23	100	1	23.68534916	g/vehicle per day
2	2018	5	5	4	4013	2	Excavators	23	1	1	50.81545577	g/vehicle per day
2	2018	5	5	4	4013	2	Excavators	23	2	1	146.5578391	g/vehicle per day
2	2018	5	5	4	4013	2	Excavators	23	3	1	390.2952471	g/vehicle per day
2	2018	5	5	4	4013	2	Excavators	23	79	1	45.91269763	g/vehicle per day
2	2018	5	5	4	4013	2	Excavators	23	87	1	58.93472148	g/vehicle per day
2	2018	5	5	4	4013	2	Excavators	23	100	1	22.92131212	g/vehicle per day
2	2018	6	5	4	4013	2	Excavators	23	1	1	56.88507593	g/vehicle per day
2	2018	6	5	4	4013	2	Excavators	23	2	1	164.0634572	g/vehicle per day
2	2018	6	5	4	4013	2	Excavators	23	3	1	436.9140707	g/vehicle per day
2	2018	6	5	4	4013	2	Excavators	23	79	1	51.39671213	g/vehicle per day
2	2018	6	5	4	4013	2	Excavators	23	87	1	65.97415631	g/vehicle per day
2	2018	6	5	4	4013	2	Excavators	23	100	1	25.65912815	g/vehicle per day
2	2018	7	5	4	4013	2	Excavators	23	1	1	55.05008362	g/vehicle per day
2	2018	7	5	4	4013	2	Excavators	23	2	1	158.770999	g/vehicle per day
2	2018	7	5	4	4013	2	Excavators	23	3	1	422.8199218	g/vehicle per day
2	2018	7	5	4	4013	2	Excavators	23	79	1	49.73875882	g/vehicle per day
2	2018	7	5	4	4013	2	Excavators	23	87	1	63.84597651	g/vehicle per day
2	2018	7	5	4	4013	2	Excavators	23	100	1	24.83141853	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	8	5	4	4013	2	Excavators	23	1	1	55.05008362	g/vehicle per day
2	2018	8	5	4	4013	2	Excavators	23	2	1	158.770999	g/vehicle per day
2	2018	8	5	4	4013	2	Excavators	23	3	1	422.8199218	g/vehicle per day
2	2018	8	5	4	4013	2	Excavators	23	79	1	49.73875882	g/vehicle per day
2	2018	8	5	4	4013	2	Excavators	23	87	1	63.84597651	g/vehicle per day
2	2018	8	5	4	4013	2	Excavators	23	100	1	24.83141853	g/vehicle per day
2	2018	9	5	4	4013	2	Excavators	23	1	1	52.50932415	g/vehicle per day
2	2018	9	5	4	4013	2	Excavators	23	2	1	151.4431692	g/vehicle per day
2	2018	9	5	4	4013	2	Excavators	23	3	1	403.3051512	g/vehicle per day
2	2018	9	5	4	4013	2	Excavators	23	79	1	47.44314393	g/vehicle per day
2	2018	9	5	4	4013	2	Excavators	23	87	1	60.89921916	g/vehicle per day
2	2018	9	5	4	4013	2	Excavators	23	100	1	23.68534916	g/vehicle per day
2	2018	10	5	4	4013	2	Excavators	23	1	1	50.81545577	g/vehicle per day
2	2018	10	5	4	4013	2	Excavators	23	2	1	146.5578391	g/vehicle per day
2	2018	10	5	4	4013	2	Excavators	23	3	1	390.2952471	g/vehicle per day
2	2018	10	5	4	4013	2	Excavators	23	79	1	45.91269763	g/vehicle per day
2	2018	10	5	4	4013	2	Excavators	23	87	1	58.93472148	g/vehicle per day
2	2018	10	5	4	4013	2	Excavators	23	100	1	22.92131212	g/vehicle per day
2	2018	11	5	4	4013	2	Excavators	23	1	1	52.50932415	g/vehicle per day
2	2018	11	5	4	4013	2	Excavators	23	2	1	151.4431692	g/vehicle per day
2	2018	11	5	4	4013	2	Excavators	23	3	1	403.3051512	g/vehicle per day
2	2018	11	5	4	4013	2	Excavators	23	79	1	47.44314393	g/vehicle per day
2	2018	11	5	4	4013	2	Excavators	23	87	1	60.89921916	g/vehicle per day
2	2018	11	5	4	4013	2	Excavators	23	100	1	23.68534916	g/vehicle per day
2	2018	12	5	4	4013	2	Excavators	23	1	1	45.3709524	g/vehicle per day
2	2018	12	5	4	4013	2	Excavators	23	2	1	130.8552579	g/vehicle per day
2	2018	12	5	4	4013	2	Excavators	23	3	1	348.478046	g/vehicle per day
2	2018	12	5	4	4013	2	Excavators	23	79	1	40.99348953	g/vehicle per day
2	2018	12	5	4	4013	2	Excavators	23	87	1	52.62033254	g/vehicle per day
2	2018	12	5	4	4013	2	Excavators	23	100	1	20.46547671	g/vehicle per day
2	2019	1	5	4	4013	2	Excavators	23	1	1	44.00792961	g/vehicle per day
2	2019	1	5	4	4013	2	Excavators	23	2	1	103.425585	g/vehicle per day
2	2019	1	5	4	4013	2	Excavators	23	3	1	287.7811115	g/vehicle per day
2	2019	1	5	4	4013	2	Excavators	23	79	1	39.73936565	g/vehicle per day
2	2019	1	5	4	4013	2	Excavators	23	87	1	51.26520562	g/vehicle per day
2	2019	1	5	4	4013	2	Excavators	23	100	1	14.51394525	g/vehicle per day
2	2019	2	5	4	4013	2	Excavators	23	1	1	48.72306977	g/vehicle per day
2	2019	2	5	4	4013	2	Excavators	23	2	1	114.506901	g/vehicle per day
2	2019	2	5	4	4013	2	Excavators	23	3	1	318.6149167	g/vehicle per day
2	2019	2	5	4	4013	2	Excavators	23	79	1	43.99716272	g/vehicle per day
2	2019	2	5	4	4013	2	Excavators	23	87	1	56.75793428	g/vehicle per day
2	2019	2	5	4	4013	2	Excavators	23	100	1	16.06900673	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	3	5	4	4013	2	Excavators	23	1	1	49.2888794	g/vehicle per day
2	2019	3	5	4	4013	2	Excavators	23	2	1	115.8366094	g/vehicle per day
2	2019	3	5	4	4013	2	Excavators	23	3	1	322.3148037	g/vehicle per day
2	2019	3	5	4	4013	2	Excavators	23	79	1	44.50808723	g/vehicle per day
2	2019	3	5	4	4013	2	Excavators	23	87	1	57.41703935	g/vehicle per day
2	2019	3	5	4	4013	2	Excavators	23	100	1	16.25561298	g/vehicle per day
2	2019	4	5	4	4013	2	Excavators	23	1	1	50.93182537	g/vehicle per day
2	2019	4	5	4	4013	2	Excavators	23	2	1	119.6978275	g/vehicle per day
2	2019	4	5	4	4013	2	Excavators	23	3	1	333.0585637	g/vehicle per day
2	2019	4	5	4	4013	2	Excavators	23	79	1	45.99167507	g/vehicle per day
2	2019	4	5	4	4013	2	Excavators	23	87	1	59.33092571	g/vehicle per day
2	2019	4	5	4	4013	2	Excavators	23	100	1	16.79746462	g/vehicle per day
2	2019	5	5	4	4013	2	Excavators	23	1	1	49.2888794	g/vehicle per day
2	2019	5	5	4	4013	2	Excavators	23	2	1	115.8366094	g/vehicle per day
2	2019	5	5	4	4013	2	Excavators	23	3	1	322.3148037	g/vehicle per day
2	2019	5	5	4	4013	2	Excavators	23	79	1	44.50808723	g/vehicle per day
2	2019	5	5	4	4013	2	Excavators	23	87	1	57.41703935	g/vehicle per day
2	2019	5	5	4	4013	2	Excavators	23	100	1	16.25561298	g/vehicle per day
2	2019	6	5	4	4013	2	Excavators	23	1	1	55.17613948	g/vehicle per day
2	2019	6	5	4	4013	2	Excavators	23	2	1	129.6726504	g/vehicle per day
2	2019	6	5	4	4013	2	Excavators	23	3	1	360.8135444	g/vehicle per day
2	2019	6	5	4	4013	2	Excavators	23	79	1	49.82428782	g/vehicle per day
2	2019	6	5	4	4013	2	Excavators	23	87	1	64.27513221	g/vehicle per day
2	2019	6	5	4	4013	2	Excavators	23	100	1	18.19725812	g/vehicle per day
2	2019	7	5	4	4013	2	Excavators	23	1	1	53.39625083	g/vehicle per day
2	2019	7	5	4	4013	2	Excavators	23	2	1	125.4896233	g/vehicle per day
2	2019	7	5	4	4013	2	Excavators	23	3	1	349.1743793	g/vehicle per day
2	2019	7	5	4	4013	2	Excavators	23	79	1	48.21705524	g/vehicle per day
2	2019	7	5	4	4013	2	Excavators	23	87	1	62.2017651	g/vehicle per day
2	2019	7	5	4	4013	2	Excavators	23	100	1	17.61024553	g/vehicle per day
2	2019	8	5	4	4013	2	Excavators	23	1	1	53.39625083	g/vehicle per day
2	2019	8	5	4	4013	2	Excavators	23	2	1	125.4896233	g/vehicle per day
2	2019	8	5	4	4013	2	Excavators	23	3	1	349.1743793	g/vehicle per day
2	2019	8	5	4	4013	2	Excavators	23	79	1	48.21705524	g/vehicle per day
2	2019	8	5	4	4013	2	Excavators	23	87	1	62.2017651	g/vehicle per day
2	2019	8	5	4	4013	2	Excavators	23	100	1	17.61024553	g/vehicle per day
2	2019	9	5	4	4013	2	Excavators	23	1	1	50.93182537	g/vehicle per day
2	2019	9	5	4	4013	2	Excavators	23	2	1	119.6978275	g/vehicle per day
2	2019	9	5	4	4013	2	Excavators	23	3	1	333.0585637	g/vehicle per day
2	2019	9	5	4	4013	2	Excavators	23	79	1	45.99167507	g/vehicle per day
2	2019	9	5	4	4013	2	Excavators	23	87	1	59.33092571	g/vehicle per day
2	2019	9	5	4	4013	2	Excavators	23	100	1	16.79746462	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	10	5	4	4013	2	Excavators	23	1	1	49.2888794	g/vehicle per day
2	2019	10	5	4	4013	2	Excavators	23	2	1	115.8366094	g/vehicle per day
2	2019	10	5	4	4013	2	Excavators	23	3	1	322.3148037	g/vehicle per day
2	2019	10	5	4	4013	2	Excavators	23	79	1	44.50808723	g/vehicle per day
2	2019	10	5	4	4013	2	Excavators	23	87	1	57.41703935	g/vehicle per day
2	2019	10	5	4	4013	2	Excavators	23	100	1	16.25561298	g/vehicle per day
2	2019	11	5	4	4013	2	Excavators	23	1	1	50.93182537	g/vehicle per day
2	2019	11	5	4	4013	2	Excavators	23	2	1	119.6978275	g/vehicle per day
2	2019	11	5	4	4013	2	Excavators	23	3	1	333.0585637	g/vehicle per day
2	2019	11	5	4	4013	2	Excavators	23	79	1	45.99167507	g/vehicle per day
2	2019	11	5	4	4013	2	Excavators	23	87	1	59.33092571	g/vehicle per day
2	2019	11	5	4	4013	2	Excavators	23	100	1	16.79746462	g/vehicle per day
2	2019	12	5	4	4013	2	Excavators	23	1	1	44.00792961	g/vehicle per day
2	2019	12	5	4	4013	2	Excavators	23	2	1	103.425585	g/vehicle per day
2	2019	12	5	4	4013	2	Excavators	23	3	1	287.7811115	g/vehicle per day
2	2019	12	5	4	4013	2	Excavators	23	79	1	39.73936565	g/vehicle per day
2	2019	12	5	4	4013	2	Excavators	23	87	1	51.26520562	g/vehicle per day
2	2019	12	5	4	4013	2	Excavators	23	100	1	14.51394525	g/vehicle per day
2	2017	1	5	4	4013	3	Forklifts	23	1	1	40.43731325	g/vehicle per day
2	2017	1	5	4	4013	3	Forklifts	23	2	1	145.020674	g/vehicle per day
2	2017	1	5	4	4013	3	Forklifts	23	3	1	396.0530142	g/vehicle per day
2	2017	1	5	4	4013	3	Forklifts	23	79	1	36.48534641	g/vehicle per day
2	2017	1	5	4	4013	3	Forklifts	23	87	1	46.71895969	g/vehicle per day
2	2017	1	5	4	4013	3	Forklifts	23	100	1	13.23818434	g/vehicle per day
2	2017	2	5	4	4013	3	Forklifts	23	1	1	44.76988484	g/vehicle per day
2	2017	2	5	4	4013	3	Forklifts	23	2	1	160.5586912	g/vehicle per day
2	2017	2	5	4	4013	3	Forklifts	23	3	1	438.4871825	g/vehicle per day
2	2017	2	5	4	4013	3	Forklifts	23	79	1	40.39450092	g/vehicle per day
2	2017	2	5	4	4013	3	Forklifts	23	87	1	51.72456604	g/vehicle per day
2	2017	2	5	4	4013	3	Forklifts	23	100	1	14.65656245	g/vehicle per day
2	2017	3	5	4	4013	3	Forklifts	23	1	1	40.43731325	g/vehicle per day
2	2017	3	5	4	4013	3	Forklifts	23	2	1	145.020674	g/vehicle per day
2	2017	3	5	4	4013	3	Forklifts	23	3	1	396.0530142	g/vehicle per day
2	2017	3	5	4	4013	3	Forklifts	23	79	1	36.48534641	g/vehicle per day
2	2017	3	5	4	4013	3	Forklifts	23	87	1	46.71895969	g/vehicle per day
2	2017	3	5	4	4013	3	Forklifts	23	100	1	13.23818434	g/vehicle per day
2	2017	4	5	4	4013	3	Forklifts	23	1	1	41.78521782	g/vehicle per day
2	2017	4	5	4	4013	3	Forklifts	23	2	1	149.8547091	g/vehicle per day
2	2017	4	5	4	4013	3	Forklifts	23	3	1	409.2547942	g/vehicle per day
2	2017	4	5	4	4013	3	Forklifts	23	79	1	37.70149982	g/vehicle per day
2	2017	4	5	4	4013	3	Forklifts	23	87	1	48.27625611	g/vehicle per day
2	2017	4	5	4	4013	3	Forklifts	23	100	1	13.6794661	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	5	5	4	4013	3	Forklifts	23	1	1	40.43731325	g/vehicle per day
2	2017	5	5	4	4013	3	Forklifts	23	2	1	145.020674	g/vehicle per day
2	2017	5	5	4	4013	3	Forklifts	23	3	1	396.0530142	g/vehicle per day
2	2017	5	5	4	4013	3	Forklifts	23	79	1	36.48534641	g/vehicle per day
2	2017	5	5	4	4013	3	Forklifts	23	87	1	46.71895969	g/vehicle per day
2	2017	5	5	4	4013	3	Forklifts	23	100	1	13.23818434	g/vehicle per day
2	2017	6	5	4	4013	3	Forklifts	23	1	1	41.78521782	g/vehicle per day
2	2017	6	5	4	4013	3	Forklifts	23	2	1	149.8547091	g/vehicle per day
2	2017	6	5	4	4013	3	Forklifts	23	3	1	409.2547942	g/vehicle per day
2	2017	6	5	4	4013	3	Forklifts	23	79	1	37.70149982	g/vehicle per day
2	2017	6	5	4	4013	3	Forklifts	23	87	1	48.27625611	g/vehicle per day
2	2017	6	5	4	4013	3	Forklifts	23	100	1	13.6794661	g/vehicle per day
2	2017	7	5	4	4013	3	Forklifts	23	1	1	40.43731325	g/vehicle per day
2	2017	7	5	4	4013	3	Forklifts	23	2	1	145.020674	g/vehicle per day
2	2017	7	5	4	4013	3	Forklifts	23	3	1	396.0530142	g/vehicle per day
2	2017	7	5	4	4013	3	Forklifts	23	79	1	36.48534641	g/vehicle per day
2	2017	7	5	4	4013	3	Forklifts	23	87	1	46.71895969	g/vehicle per day
2	2017	7	5	4	4013	3	Forklifts	23	100	1	13.23818434	g/vehicle per day
2	2017	8	5	4	4013	3	Forklifts	23	1	1	40.43731325	g/vehicle per day
2	2017	8	5	4	4013	3	Forklifts	23	2	1	145.020674	g/vehicle per day
2	2017	8	5	4	4013	3	Forklifts	23	3	1	396.0530142	g/vehicle per day
2	2017	8	5	4	4013	3	Forklifts	23	79	1	36.48534641	g/vehicle per day
2	2017	8	5	4	4013	3	Forklifts	23	87	1	46.71895969	g/vehicle per day
2	2017	8	5	4	4013	3	Forklifts	23	100	1	13.23818434	g/vehicle per day
2	2017	9	5	4	4013	3	Forklifts	23	1	1	41.78521782	g/vehicle per day
2	2017	9	5	4	4013	3	Forklifts	23	2	1	149.8547091	g/vehicle per day
2	2017	9	5	4	4013	3	Forklifts	23	3	1	409.2547942	g/vehicle per day
2	2017	9	5	4	4013	3	Forklifts	23	79	1	37.70149982	g/vehicle per day
2	2017	9	5	4	4013	3	Forklifts	23	87	1	48.27625611	g/vehicle per day
2	2017	9	5	4	4013	3	Forklifts	23	100	1	13.6794661	g/vehicle per day
2	2017	10	5	4	4013	3	Forklifts	23	1	1	40.43731325	g/vehicle per day
2	2017	10	5	4	4013	3	Forklifts	23	2	1	145.020674	g/vehicle per day
2	2017	10	5	4	4013	3	Forklifts	23	3	1	396.0530142	g/vehicle per day
2	2017	10	5	4	4013	3	Forklifts	23	79	1	36.48534641	g/vehicle per day
2	2017	10	5	4	4013	3	Forklifts	23	87	1	46.71895969	g/vehicle per day
2	2017	10	5	4	4013	3	Forklifts	23	100	1	13.23818434	g/vehicle per day
2	2017	11	5	4	4013	3	Forklifts	23	1	1	41.78521782	g/vehicle per day
2	2017	11	5	4	4013	3	Forklifts	23	2	1	149.8547091	g/vehicle per day
2	2017	11	5	4	4013	3	Forklifts	23	3	1	409.2547942	g/vehicle per day
2	2017	11	5	4	4013	3	Forklifts	23	79	1	37.70149982	g/vehicle per day
2	2017	11	5	4	4013	3	Forklifts	23	87	1	48.27625611	g/vehicle per day
2	2017	11	5	4	4013	3	Forklifts	23	100	1	13.6794661	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	12	5	4	4013	3	Forklifts	23	1	1	40.43731325	g/vehicle per day
2	2017	12	5	4	4013	3	Forklifts	23	2	1	145.020674	g/vehicle per day
2	2017	12	5	4	4013	3	Forklifts	23	3	1	396.0530142	g/vehicle per day
2	2017	12	5	4	4013	3	Forklifts	23	79	1	36.48534641	g/vehicle per day
2	2017	12	5	4	4013	3	Forklifts	23	87	1	46.71895969	g/vehicle per day
2	2017	12	5	4	4013	3	Forklifts	23	100	1	13.23818434	g/vehicle per day
1	2018	1	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
1	2018	1	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
1	2018	1	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
1	2018	1	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
1	2018	1	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
1	2018	1	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
1	2018	2	5	4	4013	3	Forklifts	23	1	1	44.01143136	g/vehicle per day
1	2018	2	5	4	4013	3	Forklifts	23	2	1	130.5846174	g/vehicle per day
1	2018	2	5	4	4013	3	Forklifts	23	3	1	385.1575065	g/vehicle per day
1	2018	2	5	4	4013	3	Forklifts	23	79	1	39.70100946	g/vehicle per day
1	2018	2	5	4	4013	3	Forklifts	23	87	1	50.95408049	g/vehicle per day
1	2018	2	5	4	4013	3	Forklifts	23	100	1	9.765036205	g/vehicle per day
1	2018	3	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
1	2018	3	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
1	2018	3	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
1	2018	3	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
1	2018	3	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
1	2018	3	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
1	2018	4	5	4	4013	3	Forklifts	23	1	1	41.07729111	g/vehicle per day
1	2018	4	5	4	4013	3	Forklifts	23	2	1	121.8789663	g/vehicle per day
1	2018	4	5	4	4013	3	Forklifts	23	3	1	359.4803225	g/vehicle per day
1	2018	4	5	4	4013	3	Forklifts	23	79	1	37.05426791	g/vehicle per day
1	2018	4	5	4	4013	3	Forklifts	23	87	1	47.55714161	g/vehicle per day
1	2018	4	5	4	4013	3	Forklifts	23	100	1	9.114035166	g/vehicle per day
1	2018	5	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
1	2018	5	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
1	2018	5	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
1	2018	5	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
1	2018	5	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
1	2018	5	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
1	2018	6	5	4	4013	3	Forklifts	23	1	1	41.07729111	g/vehicle per day
1	2018	6	5	4	4013	3	Forklifts	23	2	1	121.8789663	g/vehicle per day
1	2018	6	5	4	4013	3	Forklifts	23	3	1	359.4803225	g/vehicle per day
1	2018	6	5	4	4013	3	Forklifts	23	79	1	37.05426791	g/vehicle per day
1	2018	6	5	4	4013	3	Forklifts	23	87	1	47.55714161	g/vehicle per day
1	2018	6	5	4	4013	3	Forklifts	23	100	1	9.114035166	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	7	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
1	2018	7	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
1	2018	7	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
1	2018	7	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
1	2018	7	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
1	2018	7	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
1	2018	8	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
1	2018	8	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
1	2018	8	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
1	2018	8	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
1	2018	8	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
1	2018	8	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
1	2018	9	5	4	4013	3	Forklifts	23	1	1	41.07729111	g/vehicle per day
1	2018	9	5	4	4013	3	Forklifts	23	2	1	121.8789663	g/vehicle per day
1	2018	9	5	4	4013	3	Forklifts	23	3	1	359.4803225	g/vehicle per day
1	2018	9	5	4	4013	3	Forklifts	23	79	1	37.05426791	g/vehicle per day
1	2018	9	5	4	4013	3	Forklifts	23	87	1	47.55714161	g/vehicle per day
1	2018	9	5	4	4013	3	Forklifts	23	100	1	9.114035166	g/vehicle per day
1	2018	10	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
1	2018	10	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
1	2018	10	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
1	2018	10	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
1	2018	10	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
1	2018	10	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
1	2018	11	5	4	4013	3	Forklifts	23	1	1	41.07729111	g/vehicle per day
1	2018	11	5	4	4013	3	Forklifts	23	2	1	121.8789663	g/vehicle per day
1	2018	11	5	4	4013	3	Forklifts	23	3	1	359.4803225	g/vehicle per day
1	2018	11	5	4	4013	3	Forklifts	23	79	1	37.05426791	g/vehicle per day
1	2018	11	5	4	4013	3	Forklifts	23	87	1	47.55714161	g/vehicle per day
1	2018	11	5	4	4013	3	Forklifts	23	100	1	9.114035166	g/vehicle per day
1	2018	12	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
1	2018	12	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
1	2018	12	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
1	2018	12	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
1	2018	12	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
1	2018	12	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
2	2018	1	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
2	2018	1	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
2	2018	1	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
2	2018	1	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
2	2018	1	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
2	2018	1	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	2	5	4	4013	3	Forklifts	23	1	1	44.01143136	g/vehicle per day
2	2018	2	5	4	4013	3	Forklifts	23	2	1	130.5846174	g/vehicle per day
2	2018	2	5	4	4013	3	Forklifts	23	3	1	385.1575065	g/vehicle per day
2	2018	2	5	4	4013	3	Forklifts	23	79	1	39.70100946	g/vehicle per day
2	2018	2	5	4	4013	3	Forklifts	23	87	1	50.95408049	g/vehicle per day
2	2018	2	5	4	4013	3	Forklifts	23	100	1	9.765036205	g/vehicle per day
2	2018	3	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
2	2018	3	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
2	2018	3	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
2	2018	3	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
2	2018	3	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
2	2018	3	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
2	2018	4	5	4	4013	3	Forklifts	23	1	1	41.07729111	g/vehicle per day
2	2018	4	5	4	4013	3	Forklifts	23	2	1	121.8789663	g/vehicle per day
2	2018	4	5	4	4013	3	Forklifts	23	3	1	359.4803225	g/vehicle per day
2	2018	4	5	4	4013	3	Forklifts	23	79	1	37.05426791	g/vehicle per day
2	2018	4	5	4	4013	3	Forklifts	23	87	1	47.55714161	g/vehicle per day
2	2018	4	5	4	4013	3	Forklifts	23	100	1	9.114035166	g/vehicle per day
2	2018	5	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
2	2018	5	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
2	2018	5	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
2	2018	5	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
2	2018	5	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
2	2018	5	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
2	2018	6	5	4	4013	3	Forklifts	23	1	1	41.07729111	g/vehicle per day
2	2018	6	5	4	4013	3	Forklifts	23	2	1	121.8789663	g/vehicle per day
2	2018	6	5	4	4013	3	Forklifts	23	3	1	359.4803225	g/vehicle per day
2	2018	6	5	4	4013	3	Forklifts	23	79	1	37.05426791	g/vehicle per day
2	2018	6	5	4	4013	3	Forklifts	23	87	1	47.55714161	g/vehicle per day
2	2018	6	5	4	4013	3	Forklifts	23	100	1	9.114035166	g/vehicle per day
2	2018	7	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
2	2018	7	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
2	2018	7	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
2	2018	7	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
2	2018	7	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
2	2018	7	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
2	2018	8	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
2	2018	8	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
2	2018	8	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
2	2018	8	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
2	2018	8	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
2	2018	8	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	9	5	4	4013	3	Forklifts	23	1	1	41.07729111	g/vehicle per day
2	2018	9	5	4	4013	3	Forklifts	23	2	1	121.8789663	g/vehicle per day
2	2018	9	5	4	4013	3	Forklifts	23	3	1	359.4803225	g/vehicle per day
2	2018	9	5	4	4013	3	Forklifts	23	79	1	37.05426791	g/vehicle per day
2	2018	9	5	4	4013	3	Forklifts	23	87	1	47.55714161	g/vehicle per day
2	2018	9	5	4	4013	3	Forklifts	23	100	1	9.114035166	g/vehicle per day
2	2018	10	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
2	2018	10	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
2	2018	10	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
2	2018	10	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
2	2018	10	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
2	2018	10	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
2	2018	11	5	4	4013	3	Forklifts	23	1	1	41.07729111	g/vehicle per day
2	2018	11	5	4	4013	3	Forklifts	23	2	1	121.8789663	g/vehicle per day
2	2018	11	5	4	4013	3	Forklifts	23	3	1	359.4803225	g/vehicle per day
2	2018	11	5	4	4013	3	Forklifts	23	79	1	37.05426791	g/vehicle per day
2	2018	11	5	4	4013	3	Forklifts	23	87	1	47.55714161	g/vehicle per day
2	2018	11	5	4	4013	3	Forklifts	23	100	1	9.114035166	g/vehicle per day
2	2018	12	5	4	4013	3	Forklifts	23	1	1	39.75220496	g/vehicle per day
2	2018	12	5	4	4013	3	Forklifts	23	2	1	117.9473536	g/vehicle per day
2	2018	12	5	4	4013	3	Forklifts	23	3	1	347.8839654	g/vehicle per day
2	2018	12	5	4	4013	3	Forklifts	23	79	1	35.85894222	g/vehicle per day
2	2018	12	5	4	4013	3	Forklifts	23	87	1	46.02299562	g/vehicle per day
2	2018	12	5	4	4013	3	Forklifts	23	100	1	8.820032148	g/vehicle per day
2	2019	1	5	4	4013	3	Forklifts	23	1	1	39.37301387	g/vehicle per day
2	2019	1	5	4	4013	3	Forklifts	23	2	1	102.0260367	g/vehicle per day
2	2019	1	5	4	4013	3	Forklifts	23	3	1	325.4239019	g/vehicle per day
2	2019	1	5	4	4013	3	Forklifts	23	79	1	35.51461093	g/vehicle per day
2	2019	1	5	4	4013	3	Forklifts	23	87	1	45.6391537	g/vehicle per day
2	2019	1	5	4	4013	3	Forklifts	23	100	1	6.222636536	g/vehicle per day
2	2019	2	5	4	4013	3	Forklifts	23	1	1	43.59156175	g/vehicle per day
2	2019	2	5	4	4013	3	Forklifts	23	2	1	112.9574006	g/vehicle per day
2	2019	2	5	4	4013	3	Forklifts	23	3	1	360.2909264	g/vehicle per day
2	2019	2	5	4	4013	3	Forklifts	23	79	1	39.31976629	g/vehicle per day
2	2019	2	5	4	4013	3	Forklifts	23	87	1	50.52905193	g/vehicle per day
2	2019	2	5	4	4013	3	Forklifts	23	100	1	6.889346565	g/vehicle per day
2	2019	3	5	4	4013	3	Forklifts	23	1	1	39.37301387	g/vehicle per day
2	2019	3	5	4	4013	3	Forklifts	23	2	1	102.0260367	g/vehicle per day
2	2019	3	5	4	4013	3	Forklifts	23	3	1	325.4239019	g/vehicle per day
2	2019	3	5	4	4013	3	Forklifts	23	79	1	35.51461093	g/vehicle per day
2	2019	3	5	4	4013	3	Forklifts	23	87	1	45.6391537	g/vehicle per day
2	2019	3	5	4	4013	3	Forklifts	23	100	1	6.222636536	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	4	5	4	4013	3	Forklifts	23	1	1	40.68544329	g/vehicle per day
2	2019	4	5	4	4013	3	Forklifts	23	2	1	105.4268881	g/vehicle per day
2	2019	4	5	4	4013	3	Forklifts	23	3	1	336.2714517	g/vehicle per day
2	2019	4	5	4	4013	3	Forklifts	23	79	1	36.69844004	g/vehicle per day
2	2019	4	5	4	4013	3	Forklifts	23	87	1	47.1604511	g/vehicle per day
2	2019	4	5	4	4013	3	Forklifts	23	100	1	6.430060382	g/vehicle per day
2	2019	5	5	4	4013	3	Forklifts	23	1	1	39.37301387	g/vehicle per day
2	2019	5	5	4	4013	3	Forklifts	23	2	1	102.0260367	g/vehicle per day
2	2019	5	5	4	4013	3	Forklifts	23	3	1	325.4239019	g/vehicle per day
2	2019	5	5	4	4013	3	Forklifts	23	79	1	35.51461093	g/vehicle per day
2	2019	5	5	4	4013	3	Forklifts	23	87	1	45.6391537	g/vehicle per day
2	2019	5	5	4	4013	3	Forklifts	23	100	1	6.222636536	g/vehicle per day
2	2019	6	5	4	4013	3	Forklifts	23	1	1	40.68544329	g/vehicle per day
2	2019	6	5	4	4013	3	Forklifts	23	2	1	105.4268881	g/vehicle per day
2	2019	6	5	4	4013	3	Forklifts	23	3	1	336.2714517	g/vehicle per day
2	2019	6	5	4	4013	3	Forklifts	23	79	1	36.69844004	g/vehicle per day
2	2019	6	5	4	4013	3	Forklifts	23	87	1	47.1604511	g/vehicle per day
2	2019	6	5	4	4013	3	Forklifts	23	100	1	6.430060382	g/vehicle per day
2	2019	7	5	4	4013	3	Forklifts	23	1	1	39.37301387	g/vehicle per day
2	2019	7	5	4	4013	3	Forklifts	23	2	1	102.0260367	g/vehicle per day
2	2019	7	5	4	4013	3	Forklifts	23	3	1	325.4239019	g/vehicle per day
2	2019	7	5	4	4013	3	Forklifts	23	79	1	35.51461093	g/vehicle per day
2	2019	7	5	4	4013	3	Forklifts	23	87	1	45.6391537	g/vehicle per day
2	2019	7	5	4	4013	3	Forklifts	23	100	1	6.222636536	g/vehicle per day
2	2019	8	5	4	4013	3	Forklifts	23	1	1	39.37301387	g/vehicle per day
2	2019	8	5	4	4013	3	Forklifts	23	2	1	102.0260367	g/vehicle per day
2	2019	8	5	4	4013	3	Forklifts	23	3	1	325.4239019	g/vehicle per day
2	2019	8	5	4	4013	3	Forklifts	23	79	1	35.51461093	g/vehicle per day
2	2019	8	5	4	4013	3	Forklifts	23	87	1	45.6391537	g/vehicle per day
2	2019	8	5	4	4013	3	Forklifts	23	100	1	6.222636536	g/vehicle per day
2	2019	9	5	4	4013	3	Forklifts	23	1	1	40.68544329	g/vehicle per day
2	2019	9	5	4	4013	3	Forklifts	23	2	1	105.4268881	g/vehicle per day
2	2019	9	5	4	4013	3	Forklifts	23	3	1	336.2714517	g/vehicle per day
2	2019	9	5	4	4013	3	Forklifts	23	79	1	36.69844004	g/vehicle per day
2	2019	9	5	4	4013	3	Forklifts	23	87	1	47.1604511	g/vehicle per day
2	2019	9	5	4	4013	3	Forklifts	23	100	1	6.430060382	g/vehicle per day
2	2019	10	5	4	4013	3	Forklifts	23	1	1	39.37301387	g/vehicle per day
2	2019	10	5	4	4013	3	Forklifts	23	2	1	102.0260367	g/vehicle per day
2	2019	10	5	4	4013	3	Forklifts	23	3	1	325.4239019	g/vehicle per day
2	2019	10	5	4	4013	3	Forklifts	23	79	1	35.51461093	g/vehicle per day
2	2019	10	5	4	4013	3	Forklifts	23	87	1	45.6391537	g/vehicle per day
2	2019	10	5	4	4013	3	Forklifts	23	100	1	6.222636536	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	11	5	4	4013	3	Forklifts	23	1	1	40.68544329	g/vehicle per day
2	2019	11	5	4	4013	3	Forklifts	23	2	1	105.4268881	g/vehicle per day
2	2019	11	5	4	4013	3	Forklifts	23	3	1	336.2714517	g/vehicle per day
2	2019	11	5	4	4013	3	Forklifts	23	79	1	36.69844004	g/vehicle per day
2	2019	11	5	4	4013	3	Forklifts	23	87	1	47.1604511	g/vehicle per day
2	2019	11	5	4	4013	3	Forklifts	23	100	1	6.430060382	g/vehicle per day
2	2019	12	5	4	4013	3	Forklifts	23	1	1	39.37301387	g/vehicle per day
2	2019	12	5	4	4013	3	Forklifts	23	2	1	102.0260367	g/vehicle per day
2	2019	12	5	4	4013	3	Forklifts	23	3	1	325.4239019	g/vehicle per day
2	2019	12	5	4	4013	3	Forklifts	23	79	1	35.51461093	g/vehicle per day
2	2019	12	5	4	4013	3	Forklifts	23	87	1	45.6391537	g/vehicle per day
2	2019	12	5	4	4013	3	Forklifts	23	100	1	6.222636536	g/vehicle per day
2	2017	1	5	4	4013	2	Graders	23	1	1	50.51583411	g/vehicle per day
2	2017	1	5	4	4013	2	Graders	23	2	1	169.1660286	g/vehicle per day
2	2017	1	5	4	4013	2	Graders	23	3	1	445.1778189	g/vehicle per day
2	2017	1	5	4	4013	2	Graders	23	79	1	45.71692459	g/vehicle per day
2	2017	1	5	4	4013	2	Graders	23	87	1	58.12566308	g/vehicle per day
2	2017	1	5	4	4013	2	Graders	23	100	1	31.06023048	g/vehicle per day
2	2017	2	5	4	4013	2	Graders	23	1	1	55.92827065	g/vehicle per day
2	2017	2	5	4	4013	2	Graders	23	2	1	187.290933	g/vehicle per day
2	2017	2	5	4	4013	2	Graders	23	3	1	492.8753483	g/vehicle per day
2	2017	2	5	4	4013	2	Graders	23	79	1	50.61516748	g/vehicle per day
2	2017	2	5	4	4013	2	Graders	23	87	1	64.35345472	g/vehicle per day
2	2017	2	5	4	4013	2	Graders	23	100	1	34.38810844	g/vehicle per day
2	2017	3	5	4	4013	2	Graders	23	1	1	56.57771388	g/vehicle per day
2	2017	3	5	4	4013	2	Graders	23	2	1	189.4657943	g/vehicle per day
2	2017	3	5	4	4013	2	Graders	23	3	1	498.5989151	g/vehicle per day
2	2017	3	5	4	4013	2	Graders	23	79	1	51.20293677	g/vehicle per day
2	2017	3	5	4	4013	2	Graders	23	87	1	65.1007324	g/vehicle per day
2	2017	3	5	4	4013	2	Graders	23	100	1	34.78746016	g/vehicle per day
2	2017	4	5	4	4013	2	Graders	23	1	1	58.46367253	g/vehicle per day
2	2017	4	5	4	4013	2	Graders	23	2	1	195.7814825	g/vehicle per day
2	2017	4	5	4	4013	2	Graders	23	3	1	515.219087	g/vehicle per day
2	2017	4	5	4	4013	2	Graders	23	79	1	52.90973628	g/vehicle per day
2	2017	4	5	4	4013	2	Graders	23	87	1	67.27081823	g/vehicle per day
2	2017	4	5	4	4013	2	Graders	23	100	1	35.94704029	g/vehicle per day
2	2017	5	5	4	4013	2	Graders	23	1	1	56.57771388	g/vehicle per day
2	2017	5	5	4	4013	2	Graders	23	2	1	189.4657943	g/vehicle per day
2	2017	5	5	4	4013	2	Graders	23	3	1	498.5989151	g/vehicle per day
2	2017	5	5	4	4013	2	Graders	23	79	1	51.20293677	g/vehicle per day
2	2017	5	5	4	4013	2	Graders	23	87	1	65.1007324	g/vehicle per day
2	2017	5	5	4	4013	2	Graders	23	100	1	34.78746016	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	6	5	4	4013	2	Graders	23	1	1	63.33564153	g/vehicle per day
2	2017	6	5	4	4013	2	Graders	23	2	1	212.0964645	g/vehicle per day
2	2017	6	5	4	4013	2	Graders	23	3	1	558.1540285	g/vehicle per day
2	2017	6	5	4	4013	2	Graders	23	79	1	57.3188602	g/vehicle per day
2	2017	6	5	4	4013	2	Graders	23	87	1	72.87668542	g/vehicle per day
2	2017	6	5	4	4013	2	Graders	23	100	1	38.94263489	g/vehicle per day
2	2017	7	5	4	4013	2	Graders	23	1	1	61.29253316	g/vehicle per day
2	2017	7	5	4	4013	2	Graders	23	2	1	205.2547194	g/vehicle per day
2	2017	7	5	4	4013	2	Graders	23	3	1	540.1489873	g/vehicle per day
2	2017	7	5	4	4013	2	Graders	23	79	1	55.46983737	g/vehicle per day
2	2017	7	5	4	4013	2	Graders	23	87	1	70.52584541	g/vehicle per day
2	2017	7	5	4	4013	2	Graders	23	100	1	37.68641531	g/vehicle per day
2	2017	8	5	4	4013	2	Graders	23	1	1	61.29253316	g/vehicle per day
2	2017	8	5	4	4013	2	Graders	23	2	1	205.2547194	g/vehicle per day
2	2017	8	5	4	4013	2	Graders	23	3	1	540.1489873	g/vehicle per day
2	2017	8	5	4	4013	2	Graders	23	79	1	55.46983737	g/vehicle per day
2	2017	8	5	4	4013	2	Graders	23	87	1	70.52584541	g/vehicle per day
2	2017	8	5	4	4013	2	Graders	23	100	1	37.68641531	g/vehicle per day
2	2017	9	5	4	4013	2	Graders	23	1	1	58.46367253	g/vehicle per day
2	2017	9	5	4	4013	2	Graders	23	2	1	195.7814825	g/vehicle per day
2	2017	9	5	4	4013	2	Graders	23	3	1	515.219087	g/vehicle per day
2	2017	9	5	4	4013	2	Graders	23	79	1	52.90973628	g/vehicle per day
2	2017	9	5	4	4013	2	Graders	23	87	1	67.27081823	g/vehicle per day
2	2017	9	5	4	4013	2	Graders	23	100	1	35.94704029	g/vehicle per day
2	2017	10	5	4	4013	2	Graders	23	1	1	56.57771388	g/vehicle per day
2	2017	10	5	4	4013	2	Graders	23	2	1	189.4657943	g/vehicle per day
2	2017	10	5	4	4013	2	Graders	23	3	1	498.5989151	g/vehicle per day
2	2017	10	5	4	4013	2	Graders	23	79	1	51.20293677	g/vehicle per day
2	2017	10	5	4	4013	2	Graders	23	87	1	65.1007324	g/vehicle per day
2	2017	10	5	4	4013	2	Graders	23	100	1	34.78746016	g/vehicle per day
2	2017	11	5	4	4013	2	Graders	23	1	1	58.46367253	g/vehicle per day
2	2017	11	5	4	4013	2	Graders	23	2	1	195.7814825	g/vehicle per day
2	2017	11	5	4	4013	2	Graders	23	3	1	515.219087	g/vehicle per day
2	2017	11	5	4	4013	2	Graders	23	79	1	52.90973628	g/vehicle per day
2	2017	11	5	4	4013	2	Graders	23	87	1	67.27081823	g/vehicle per day
2	2017	11	5	4	4013	2	Graders	23	100	1	35.94704029	g/vehicle per day
2	2017	12	5	4	4013	2	Graders	23	1	1	50.51583411	g/vehicle per day
2	2017	12	5	4	4013	2	Graders	23	2	1	169.1660286	g/vehicle per day
2	2017	12	5	4	4013	2	Graders	23	3	1	445.1778189	g/vehicle per day
2	2017	12	5	4	4013	2	Graders	23	79	1	45.71692459	g/vehicle per day
2	2017	12	5	4	4013	2	Graders	23	87	1	58.12566308	g/vehicle per day
2	2017	12	5	4	4013	2	Graders	23	100	1	31.06023048	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	1	5	4	4013	2	Graders	23	1	1	48.24963048	g/vehicle per day
1	2018	1	5	4	4013	2	Graders	23	2	1	134.4977018	g/vehicle per day
1	2018	1	5	4	4013	2	Graders	23	3	1	364.1444701	g/vehicle per day
1	2018	1	5	4	4013	2	Graders	23	79	1	43.61221739	g/vehicle per day
1	2018	1	5	4	4013	2	Graders	23	87	1	55.86271456	g/vehicle per day
1	2018	1	5	4	4013	2	Graders	23	100	1	23.44251321	g/vehicle per day
1	2018	2	5	4	4013	2	Graders	23	1	1	53.41922352	g/vehicle per day
1	2018	2	5	4	4013	2	Graders	23	2	1	148.9080921	g/vehicle per day
1	2018	2	5	4	4013	2	Graders	23	3	1	403.1598934	g/vehicle per day
1	2018	2	5	4	4013	2	Graders	23	79	1	48.2849416	g/vehicle per day
1	2018	2	5	4	4013	2	Graders	23	87	1	61.84800623	g/vehicle per day
1	2018	2	5	4	4013	2	Graders	23	100	1	25.95422585	g/vehicle per day
1	2018	3	5	4	4013	2	Graders	23	1	1	54.03954928	g/vehicle per day
1	2018	3	5	4	4013	2	Graders	23	2	1	150.6372853	g/vehicle per day
1	2018	3	5	4	4013	2	Graders	23	3	1	407.8417553	g/vehicle per day
1	2018	3	5	4	4013	2	Graders	23	79	1	48.84563181	g/vehicle per day
1	2018	3	5	4	4013	2	Graders	23	87	1	62.56622654	g/vehicle per day
1	2018	3	5	4	4013	2	Graders	23	100	1	26.25561486	g/vehicle per day
1	2018	4	5	4	4013	2	Graders	23	1	1	55.84085372	g/vehicle per day
1	2018	4	5	4	4013	2	Graders	23	2	1	155.6585574	g/vehicle per day
1	2018	4	5	4	4013	2	Graders	23	3	1	421.4363866	g/vehicle per day
1	2018	4	5	4	4013	2	Graders	23	79	1	50.47383006	g/vehicle per day
1	2018	4	5	4	4013	2	Graders	23	87	1	64.6517273	g/vehicle per day
1	2018	4	5	4	4013	2	Graders	23	100	1	27.13079782	g/vehicle per day
1	2018	5	5	4	4013	2	Graders	23	1	1	54.03954928	g/vehicle per day
1	2018	5	5	4	4013	2	Graders	23	2	1	150.6372853	g/vehicle per day
1	2018	5	5	4	4013	2	Graders	23	3	1	407.8417553	g/vehicle per day
1	2018	5	5	4	4013	2	Graders	23	79	1	48.84563181	g/vehicle per day
1	2018	5	5	4	4013	2	Graders	23	87	1	62.56622654	g/vehicle per day
1	2018	5	5	4	4013	2	Graders	23	100	1	26.25561486	g/vehicle per day
1	2018	6	5	4	4013	2	Graders	23	1	1	60.49429651	g/vehicle per day
1	2018	6	5	4	4013	2	Graders	23	2	1	168.6301315	g/vehicle per day
1	2018	6	5	4	4013	2	Graders	23	3	1	456.5561303	g/vehicle per day
1	2018	6	5	4	4013	2	Graders	23	79	1	54.67999082	g/vehicle per day
1	2018	6	5	4	4013	2	Graders	23	87	1	70.03941594	g/vehicle per day
1	2018	6	5	4	4013	2	Graders	23	100	1	29.39170862	g/vehicle per day
1	2018	7	5	4	4013	2	Graders	23	1	1	58.54284936	g/vehicle per day
1	2018	7	5	4	4013	2	Graders	23	2	1	163.1904206	g/vehicle per day
1	2018	7	5	4	4013	2	Graders	23	3	1	441.8284097	g/vehicle per day
1	2018	7	5	4	4013	2	Graders	23	79	1	52.91611566	g/vehicle per day
1	2018	7	5	4	4013	2	Graders	23	87	1	67.78005128	g/vehicle per day
1	2018	7	5	4	4013	2	Graders	23	100	1	28.44356853	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	8	5	4	4013	2	Graders	23	1	1	58.54284936	g/vehicle per day
1	2018	8	5	4	4013	2	Graders	23	2	1	163.1904206	g/vehicle per day
1	2018	8	5	4	4013	2	Graders	23	3	1	441.8284097	g/vehicle per day
1	2018	8	5	4	4013	2	Graders	23	79	1	52.91611566	g/vehicle per day
1	2018	8	5	4	4013	2	Graders	23	87	1	67.78005128	g/vehicle per day
1	2018	8	5	4	4013	2	Graders	23	100	1	28.44356853	g/vehicle per day
1	2018	9	5	4	4013	2	Graders	23	1	1	55.84085372	g/vehicle per day
1	2018	9	5	4	4013	2	Graders	23	2	1	155.6585574	g/vehicle per day
1	2018	9	5	4	4013	2	Graders	23	3	1	421.4363866	g/vehicle per day
1	2018	9	5	4	4013	2	Graders	23	79	1	50.47383006	g/vehicle per day
1	2018	9	5	4	4013	2	Graders	23	87	1	64.6517273	g/vehicle per day
1	2018	9	5	4	4013	2	Graders	23	100	1	27.13079782	g/vehicle per day
1	2018	10	5	4	4013	2	Graders	23	1	1	54.03954928	g/vehicle per day
1	2018	10	5	4	4013	2	Graders	23	2	1	150.6372853	g/vehicle per day
1	2018	10	5	4	4013	2	Graders	23	3	1	407.8417553	g/vehicle per day
1	2018	10	5	4	4013	2	Graders	23	79	1	48.84563181	g/vehicle per day
1	2018	10	5	4	4013	2	Graders	23	87	1	62.56622654	g/vehicle per day
1	2018	10	5	4	4013	2	Graders	23	100	1	26.25561486	g/vehicle per day
1	2018	11	5	4	4013	2	Graders	23	1	1	55.84085372	g/vehicle per day
1	2018	11	5	4	4013	2	Graders	23	2	1	155.6585574	g/vehicle per day
1	2018	11	5	4	4013	2	Graders	23	3	1	421.4363866	g/vehicle per day
1	2018	11	5	4	4013	2	Graders	23	79	1	50.47383006	g/vehicle per day
1	2018	11	5	4	4013	2	Graders	23	87	1	64.6517273	g/vehicle per day
1	2018	11	5	4	4013	2	Graders	23	100	1	27.13079782	g/vehicle per day
1	2018	12	5	4	4013	2	Graders	23	1	1	48.24963048	g/vehicle per day
1	2018	12	5	4	4013	2	Graders	23	2	1	134.4977018	g/vehicle per day
1	2018	12	5	4	4013	2	Graders	23	3	1	364.1444701	g/vehicle per day
1	2018	12	5	4	4013	2	Graders	23	79	1	43.61221739	g/vehicle per day
1	2018	12	5	4	4013	2	Graders	23	87	1	55.86271456	g/vehicle per day
1	2018	12	5	4	4013	2	Graders	23	100	1	23.44251321	g/vehicle per day
2	2018	1	5	4	4013	2	Graders	23	1	1	48.24963048	g/vehicle per day
2	2018	1	5	4	4013	2	Graders	23	2	1	134.4977018	g/vehicle per day
2	2018	1	5	4	4013	2	Graders	23	3	1	364.1444701	g/vehicle per day
2	2018	1	5	4	4013	2	Graders	23	79	1	43.61221739	g/vehicle per day
2	2018	1	5	4	4013	2	Graders	23	87	1	55.86271456	g/vehicle per day
2	2018	1	5	4	4013	2	Graders	23	100	1	23.44251321	g/vehicle per day
2	2018	2	5	4	4013	2	Graders	23	1	1	53.41922352	g/vehicle per day
2	2018	2	5	4	4013	2	Graders	23	2	1	148.9080921	g/vehicle per day
2	2018	2	5	4	4013	2	Graders	23	3	1	403.1598934	g/vehicle per day
2	2018	2	5	4	4013	2	Graders	23	79	1	48.2849416	g/vehicle per day
2	2018	2	5	4	4013	2	Graders	23	87	1	61.84800623	g/vehicle per day
2	2018	2	5	4	4013	2	Graders	23	100	1	25.95422585	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	3	5	4	4013	2	Graders	23	1	1	54.03954928	g/vehicle per day
2	2018	3	5	4	4013	2	Graders	23	2	1	150.6372853	g/vehicle per day
2	2018	3	5	4	4013	2	Graders	23	3	1	407.8417553	g/vehicle per day
2	2018	3	5	4	4013	2	Graders	23	79	1	48.84563181	g/vehicle per day
2	2018	3	5	4	4013	2	Graders	23	87	1	62.56622654	g/vehicle per day
2	2018	3	5	4	4013	2	Graders	23	100	1	26.25561486	g/vehicle per day
2	2018	4	5	4	4013	2	Graders	23	1	1	55.84085372	g/vehicle per day
2	2018	4	5	4	4013	2	Graders	23	2	1	155.6585574	g/vehicle per day
2	2018	4	5	4	4013	2	Graders	23	3	1	421.4363866	g/vehicle per day
2	2018	4	5	4	4013	2	Graders	23	79	1	50.47383006	g/vehicle per day
2	2018	4	5	4	4013	2	Graders	23	87	1	64.6517273	g/vehicle per day
2	2018	4	5	4	4013	2	Graders	23	100	1	27.13079782	g/vehicle per day
2	2018	5	5	4	4013	2	Graders	23	1	1	54.03954928	g/vehicle per day
2	2018	5	5	4	4013	2	Graders	23	2	1	150.6372853	g/vehicle per day
2	2018	5	5	4	4013	2	Graders	23	3	1	407.8417553	g/vehicle per day
2	2018	5	5	4	4013	2	Graders	23	79	1	48.84563181	g/vehicle per day
2	2018	5	5	4	4013	2	Graders	23	87	1	62.56622654	g/vehicle per day
2	2018	5	5	4	4013	2	Graders	23	100	1	26.25561486	g/vehicle per day
2	2018	6	5	4	4013	2	Graders	23	1	1	60.49429651	g/vehicle per day
2	2018	6	5	4	4013	2	Graders	23	2	1	168.6301315	g/vehicle per day
2	2018	6	5	4	4013	2	Graders	23	3	1	456.5561303	g/vehicle per day
2	2018	6	5	4	4013	2	Graders	23	79	1	54.67999082	g/vehicle per day
2	2018	6	5	4	4013	2	Graders	23	87	1	70.03941594	g/vehicle per day
2	2018	6	5	4	4013	2	Graders	23	100	1	29.39170862	g/vehicle per day
2	2018	7	5	4	4013	2	Graders	23	1	1	58.54284936	g/vehicle per day
2	2018	7	5	4	4013	2	Graders	23	2	1	163.1904206	g/vehicle per day
2	2018	7	5	4	4013	2	Graders	23	3	1	441.8284097	g/vehicle per day
2	2018	7	5	4	4013	2	Graders	23	79	1	52.91611566	g/vehicle per day
2	2018	7	5	4	4013	2	Graders	23	87	1	67.78005128	g/vehicle per day
2	2018	7	5	4	4013	2	Graders	23	100	1	28.44356853	g/vehicle per day
2	2018	8	5	4	4013	2	Graders	23	1	1	58.54284936	g/vehicle per day
2	2018	8	5	4	4013	2	Graders	23	2	1	163.1904206	g/vehicle per day
2	2018	8	5	4	4013	2	Graders	23	3	1	441.8284097	g/vehicle per day
2	2018	8	5	4	4013	2	Graders	23	79	1	52.91611566	g/vehicle per day
2	2018	8	5	4	4013	2	Graders	23	87	1	67.78005128	g/vehicle per day
2	2018	8	5	4	4013	2	Graders	23	100	1	28.44356853	g/vehicle per day
2	2018	9	5	4	4013	2	Graders	23	1	1	55.84085372	g/vehicle per day
2	2018	9	5	4	4013	2	Graders	23	2	1	155.6585574	g/vehicle per day
2	2018	9	5	4	4013	2	Graders	23	3	1	421.4363866	g/vehicle per day
2	2018	9	5	4	4013	2	Graders	23	79	1	50.47383006	g/vehicle per day
2	2018	9	5	4	4013	2	Graders	23	87	1	64.6517273	g/vehicle per day
2	2018	9	5	4	4013	2	Graders	23	100	1	27.13079782	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	10	5	4	4013	2	Graders	23	1	1	54.03954928	g/vehicle per day
2	2018	10	5	4	4013	2	Graders	23	2	1	150.6372853	g/vehicle per day
2	2018	10	5	4	4013	2	Graders	23	3	1	407.8417553	g/vehicle per day
2	2018	10	5	4	4013	2	Graders	23	79	1	48.84563181	g/vehicle per day
2	2018	10	5	4	4013	2	Graders	23	87	1	62.56622654	g/vehicle per day
2	2018	10	5	4	4013	2	Graders	23	100	1	26.25561486	g/vehicle per day
2	2018	11	5	4	4013	2	Graders	23	1	1	55.84085372	g/vehicle per day
2	2018	11	5	4	4013	2	Graders	23	2	1	155.6585574	g/vehicle per day
2	2018	11	5	4	4013	2	Graders	23	3	1	421.4363866	g/vehicle per day
2	2018	11	5	4	4013	2	Graders	23	79	1	50.47383006	g/vehicle per day
2	2018	11	5	4	4013	2	Graders	23	87	1	64.6517273	g/vehicle per day
2	2018	11	5	4	4013	2	Graders	23	100	1	27.13079782	g/vehicle per day
2	2018	12	5	4	4013	2	Graders	23	1	1	48.24963048	g/vehicle per day
2	2018	12	5	4	4013	2	Graders	23	2	1	134.4977018	g/vehicle per day
2	2018	12	5	4	4013	2	Graders	23	3	1	364.1444701	g/vehicle per day
2	2018	12	5	4	4013	2	Graders	23	79	1	43.61221739	g/vehicle per day
2	2018	12	5	4	4013	2	Graders	23	87	1	55.86271456	g/vehicle per day
2	2018	12	5	4	4013	2	Graders	23	100	1	23.44251321	g/vehicle per day
2	2019	1	5	4	4013	2	Graders	23	1	1	46.38387862	g/vehicle per day
2	2019	1	5	4	4013	2	Graders	23	2	1	103.9102716	g/vehicle per day
2	2019	1	5	4	4013	2	Graders	23	3	1	293.536098	g/vehicle per day
2	2019	1	5	4	4013	2	Graders	23	79	1	41.89410818	g/vehicle per day
2	2019	1	5	4	4013	2	Graders	23	87	1	54.00565895	g/vehicle per day
2	2019	1	5	4	4013	2	Graders	23	100	1	16.59164309	g/vehicle per day
2	2019	2	5	4	4013	2	Graders	23	1	1	51.35356388	g/vehicle per day
2	2019	2	5	4	4013	2	Graders	23	2	1	115.0435079	g/vehicle per day
2	2019	2	5	4	4013	2	Graders	23	3	1	324.9865371	g/vehicle per day
2	2019	2	5	4	4013	2	Graders	23	79	1	46.38276751	g/vehicle per day
2	2019	2	5	4	4013	2	Graders	23	87	1	59.79197632	g/vehicle per day
2	2019	2	5	4	4013	2	Graders	23	100	1	18.36932415	g/vehicle per day
2	2019	3	5	4	4013	2	Graders	23	1	1	51.9499379	g/vehicle per day
2	2019	3	5	4	4013	2	Graders	23	2	1	116.3794727	g/vehicle per day
2	2019	3	5	4	4013	2	Graders	23	3	1	328.7604874	g/vehicle per day
2	2019	3	5	4	4013	2	Graders	23	79	1	46.92140189	g/vehicle per day
2	2019	3	5	4	4013	2	Graders	23	87	1	60.48635746	g/vehicle per day
2	2019	3	5	4	4013	2	Graders	23	100	1	18.58263444	g/vehicle per day
2	2019	4	5	4	4013	2	Graders	23	1	1	53.68163055	g/vehicle per day
2	2019	4	5	4	4013	2	Graders	23	2	1	120.2587812	g/vehicle per day
2	2019	4	5	4	4013	2	Graders	23	3	1	339.7191914	g/vehicle per day
2	2019	4	5	4	4013	2	Graders	23	79	1	48.48549502	g/vehicle per day
2	2019	4	5	4	4013	2	Graders	23	87	1	62.50258789	g/vehicle per day
2	2019	4	5	4	4013	2	Graders	23	100	1	19.20205469	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	5	5	4	4013	2	Graders	23	1	1	51.9499379	g/vehicle per day
2	2019	5	5	4	4013	2	Graders	23	2	1	116.3794727	g/vehicle per day
2	2019	5	5	4	4013	2	Graders	23	3	1	328.7604874	g/vehicle per day
2	2019	5	5	4	4013	2	Graders	23	79	1	46.92140189	g/vehicle per day
2	2019	5	5	4	4013	2	Graders	23	87	1	60.48635746	g/vehicle per day
2	2019	5	5	4	4013	2	Graders	23	100	1	18.58263444	g/vehicle per day
2	2019	6	5	4	4013	2	Graders	23	1	1	58.15506539	g/vehicle per day
2	2019	6	5	4	4013	2	Graders	23	2	1	130.2804079	g/vehicle per day
2	2019	6	5	4	4013	2	Graders	23	3	1	368.0289216	g/vehicle per day
2	2019	6	5	4	4013	2	Graders	23	79	1	52.52589417	g/vehicle per day
2	2019	6	5	4	4013	2	Graders	23	87	1	67.7111084	g/vehicle per day
2	2019	6	5	4	4013	2	Graders	23	100	1	20.80223628	g/vehicle per day
2	2019	7	5	4	4013	2	Graders	23	1	1	56.27911483	g/vehicle per day
2	2019	7	5	4	4013	2	Graders	23	2	1	126.0777869	g/vehicle per day
2	2019	7	5	4	4013	2	Graders	23	3	1	356.1571321	g/vehicle per day
2	2019	7	5	4	4013	2	Graders	23	79	1	50.8315491	g/vehicle per day
2	2019	7	5	4	4013	2	Graders	23	87	1	65.52690917	g/vehicle per day
2	2019	7	5	4	4013	2	Graders	23	100	1	20.13118885	g/vehicle per day
2	2019	8	5	4	4013	2	Graders	23	1	1	56.27911483	g/vehicle per day
2	2019	8	5	4	4013	2	Graders	23	2	1	126.0777869	g/vehicle per day
2	2019	8	5	4	4013	2	Graders	23	3	1	356.1571321	g/vehicle per day
2	2019	8	5	4	4013	2	Graders	23	79	1	50.8315491	g/vehicle per day
2	2019	8	5	4	4013	2	Graders	23	87	1	65.52690917	g/vehicle per day
2	2019	8	5	4	4013	2	Graders	23	100	1	20.13118885	g/vehicle per day
2	2019	9	5	4	4013	2	Graders	23	1	1	53.68163055	g/vehicle per day
2	2019	9	5	4	4013	2	Graders	23	2	1	120.2587812	g/vehicle per day
2	2019	9	5	4	4013	2	Graders	23	3	1	339.7191914	g/vehicle per day
2	2019	9	5	4	4013	2	Graders	23	79	1	48.48549502	g/vehicle per day
2	2019	9	5	4	4013	2	Graders	23	87	1	62.50258789	g/vehicle per day
2	2019	9	5	4	4013	2	Graders	23	100	1	19.20205469	g/vehicle per day
2	2019	10	5	4	4013	2	Graders	23	1	1	51.9499379	g/vehicle per day
2	2019	10	5	4	4013	2	Graders	23	2	1	116.3794727	g/vehicle per day
2	2019	10	5	4	4013	2	Graders	23	3	1	328.7604874	g/vehicle per day
2	2019	10	5	4	4013	2	Graders	23	79	1	46.92140189	g/vehicle per day
2	2019	10	5	4	4013	2	Graders	23	87	1	60.48635746	g/vehicle per day
2	2019	10	5	4	4013	2	Graders	23	100	1	18.58263444	g/vehicle per day
2	2019	11	5	4	4013	2	Graders	23	1	1	53.68163055	g/vehicle per day
2	2019	11	5	4	4013	2	Graders	23	2	1	120.2587812	g/vehicle per day
2	2019	11	5	4	4013	2	Graders	23	3	1	339.7191914	g/vehicle per day
2	2019	11	5	4	4013	2	Graders	23	79	1	48.48549502	g/vehicle per day
2	2019	11	5	4	4013	2	Graders	23	87	1	62.50258789	g/vehicle per day
2	2019	11	5	4	4013	2	Graders	23	100	1	19.20205469	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	12	5	4	4013	2	Graders	23	1	1	46.38387862	g/vehicle per day
2	2019	12	5	4	4013	2	Graders	23	2	1	103.9102716	g/vehicle per day
2	2019	12	5	4	4013	2	Graders	23	3	1	293.536098	g/vehicle per day
2	2019	12	5	4	4013	2	Graders	23	79	1	41.89410818	g/vehicle per day
2	2019	12	5	4	4013	2	Graders	23	87	1	54.00565895	g/vehicle per day
2	2019	12	5	4	4013	2	Graders	23	100	1	16.59164309	g/vehicle per day
2	2017	1	5	4	4013	2	Off-highway Trucks	23	1	1	386.1742688	g/vehicle per day
2	2017	1	5	4	4013	2	Off-highway Trucks	23	2	1	1438.915512	g/vehicle per day
2	2017	1	5	4	4013	2	Off-highway Trucks	23	3	1	4333.70512	g/vehicle per day
2	2017	1	5	4	4013	2	Off-highway Trucks	23	79	1	349.1246517	g/vehicle per day
2	2017	1	5	4	4013	2	Off-highway Trucks	23	87	1	450.2193487	g/vehicle per day
2	2017	1	5	4	4013	2	Off-highway Trucks	23	100	1	151.5920634	g/vehicle per day
2	2017	2	5	4	4013	2	Off-highway Trucks	23	1	1	427.5499855	g/vehicle per day
2	2017	2	5	4	4013	2	Off-highway Trucks	23	2	1	1593.084719	g/vehicle per day
2	2017	2	5	4	4013	2	Off-highway Trucks	23	3	1	4798.029765	g/vehicle per day
2	2017	2	5	4	4013	2	Off-highway Trucks	23	79	1	386.5308047	g/vehicle per day
2	2017	2	5	4	4013	2	Off-highway Trucks	23	87	1	498.4572721	g/vehicle per day
2	2017	2	5	4	4013	2	Off-highway Trucks	23	100	1	167.8341825	g/vehicle per day
2	2017	3	5	4	4013	2	Off-highway Trucks	23	1	1	432.5150877	g/vehicle per day
2	2017	3	5	4	4013	2	Off-highway Trucks	23	2	1	1611.584508	g/vehicle per day
2	2017	3	5	4	4013	2	Off-highway Trucks	23	3	1	4853.748434	g/vehicle per day
2	2017	3	5	4	4013	2	Off-highway Trucks	23	79	1	391.019544	g/vehicle per day
2	2017	3	5	4	4013	2	Off-highway Trucks	23	87	1	504.2457055	g/vehicle per day
2	2017	3	5	4	4013	2	Off-highway Trucks	23	100	1	169.7831561	g/vehicle per day
2	2017	4	5	4	4013	2	Off-highway Trucks	23	1	1	446.9321026	g/vehicle per day
2	2017	4	5	4	4013	2	Off-highway Trucks	23	2	1	1665.304113	g/vehicle per day
2	2017	4	5	4	4013	2	Off-highway Trucks	23	3	1	5015.539057	g/vehicle per day
2	2017	4	5	4	4013	2	Off-highway Trucks	23	79	1	404.0531178	g/vehicle per day
2	2017	4	5	4	4013	2	Off-highway Trucks	23	87	1	521.0535496	g/vehicle per day
2	2017	4	5	4	4013	2	Off-highway Trucks	23	100	1	175.442644	g/vehicle per day
2	2017	5	5	4	4013	2	Off-highway Trucks	23	1	1	432.5150877	g/vehicle per day
2	2017	5	5	4	4013	2	Off-highway Trucks	23	2	1	1611.584508	g/vehicle per day
2	2017	5	5	4	4013	2	Off-highway Trucks	23	3	1	4853.748434	g/vehicle per day
2	2017	5	5	4	4013	2	Off-highway Trucks	23	79	1	391.019544	g/vehicle per day
2	2017	5	5	4	4013	2	Off-highway Trucks	23	87	1	504.2457055	g/vehicle per day
2	2017	5	5	4	4013	2	Off-highway Trucks	23	100	1	169.7831561	g/vehicle per day
2	2017	6	5	4	4013	2	Off-highway Trucks	23	1	1	484.176672	g/vehicle per day
2	2017	6	5	4	4013	2	Off-highway Trucks	23	2	1	1804.079241	g/vehicle per day
2	2017	6	5	4	4013	2	Off-highway Trucks	23	3	1	5433.500124	g/vehicle per day
2	2017	6	5	4	4013	2	Off-highway Trucks	23	79	1	437.7246765	g/vehicle per day
2	2017	6	5	4	4013	2	Off-highway Trucks	23	87	1	564.4751882	g/vehicle per day
2	2017	6	5	4	4013	2	Off-highway Trucks	23	100	1	190.0628086	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	7	5	4	4013	2	Off-highway Trucks	23	1	1	468.5580191	g/vehicle per day
2	2017	7	5	4	4013	2	Off-highway Trucks	23	2	1	1745.88314	g/vehicle per day
2	2017	7	5	4	4013	2	Off-highway Trucks	23	3	1	5258.227961	g/vehicle per day
2	2017	7	5	4	4013	2	Off-highway Trucks	23	79	1	423.604533	g/vehicle per day
2	2017	7	5	4	4013	2	Off-highway Trucks	23	87	1	546.2663556	g/vehicle per day
2	2017	7	5	4	4013	2	Off-highway Trucks	23	100	1	183.9317269	g/vehicle per day
2	2017	8	5	4	4013	2	Off-highway Trucks	23	1	1	468.5580191	g/vehicle per day
2	2017	8	5	4	4013	2	Off-highway Trucks	23	2	1	1745.88314	g/vehicle per day
2	2017	8	5	4	4013	2	Off-highway Trucks	23	3	1	5258.227961	g/vehicle per day
2	2017	8	5	4	4013	2	Off-highway Trucks	23	79	1	423.604533	g/vehicle per day
2	2017	8	5	4	4013	2	Off-highway Trucks	23	87	1	546.2663556	g/vehicle per day
2	2017	8	5	4	4013	2	Off-highway Trucks	23	100	1	183.9317269	g/vehicle per day
2	2017	9	5	4	4013	2	Off-highway Trucks	23	1	1	446.9321026	g/vehicle per day
2	2017	9	5	4	4013	2	Off-highway Trucks	23	2	1	1665.304113	g/vehicle per day
2	2017	9	5	4	4013	2	Off-highway Trucks	23	3	1	5015.539057	g/vehicle per day
2	2017	9	5	4	4013	2	Off-highway Trucks	23	79	1	404.0531178	g/vehicle per day
2	2017	9	5	4	4013	2	Off-highway Trucks	23	87	1	521.0535496	g/vehicle per day
2	2017	9	5	4	4013	2	Off-highway Trucks	23	100	1	175.442644	g/vehicle per day
2	2017	10	5	4	4013	2	Off-highway Trucks	23	1	1	432.5150877	g/vehicle per day
2	2017	10	5	4	4013	2	Off-highway Trucks	23	2	1	1611.584508	g/vehicle per day
2	2017	10	5	4	4013	2	Off-highway Trucks	23	3	1	4853.748434	g/vehicle per day
2	2017	10	5	4	4013	2	Off-highway Trucks	23	79	1	391.019544	g/vehicle per day
2	2017	10	5	4	4013	2	Off-highway Trucks	23	87	1	504.2457055	g/vehicle per day
2	2017	10	5	4	4013	2	Off-highway Trucks	23	100	1	169.7831561	g/vehicle per day
2	2017	11	5	4	4013	2	Off-highway Trucks	23	1	1	446.9321026	g/vehicle per day
2	2017	11	5	4	4013	2	Off-highway Trucks	23	2	1	1665.304113	g/vehicle per day
2	2017	11	5	4	4013	2	Off-highway Trucks	23	3	1	5015.539057	g/vehicle per day
2	2017	11	5	4	4013	2	Off-highway Trucks	23	79	1	404.0531178	g/vehicle per day
2	2017	11	5	4	4013	2	Off-highway Trucks	23	87	1	521.0535496	g/vehicle per day
2	2017	11	5	4	4013	2	Off-highway Trucks	23	100	1	175.442644	g/vehicle per day
2	2017	12	5	4	4013	2	Off-highway Trucks	23	1	1	386.1742688	g/vehicle per day
2	2017	12	5	4	4013	2	Off-highway Trucks	23	2	1	1438.915512	g/vehicle per day
2	2017	12	5	4	4013	2	Off-highway Trucks	23	3	1	4333.70512	g/vehicle per day
2	2017	12	5	4	4013	2	Off-highway Trucks	23	79	1	349.1246517	g/vehicle per day
2	2017	12	5	4	4013	2	Off-highway Trucks	23	87	1	450.2193487	g/vehicle per day
2	2017	12	5	4	4013	2	Off-highway Trucks	23	100	1	151.5920634	g/vehicle per day
1	2018	1	5	4	4013	2	Off-highway Trucks	23	1	1	369.8280939	g/vehicle per day
1	2018	1	5	4	4013	2	Off-highway Trucks	23	2	1	1168.10504	g/vehicle per day
1	2018	1	5	4	4013	2	Off-highway Trucks	23	3	1	3956.588143	g/vehicle per day
1	2018	1	5	4	4013	2	Off-highway Trucks	23	79	1	334.0379912	g/vehicle per day
1	2018	1	5	4	4013	2	Off-highway Trucks	23	87	1	433.084208	g/vehicle per day
1	2018	1	5	4	4013	2	Off-highway Trucks	23	100	1	118.5796671	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	2	5	4	4013	2	Off-highway Trucks	23	1	1	409.4528186	g/vehicle per day
1	2018	2	5	4	4013	2	Off-highway Trucks	23	2	1	1293.259361	g/vehicle per day
1	2018	2	5	4	4013	2	Off-highway Trucks	23	3	1	4380.509682	g/vehicle per day
1	2018	2	5	4	4013	2	Off-highway Trucks	23	79	1	369.8279954	g/vehicle per day
1	2018	2	5	4	4013	2	Off-highway Trucks	23	87	1	479.4862948	g/vehicle per day
1	2018	2	5	4	4013	2	Off-highway Trucks	23	100	1	131.2846602	g/vehicle per day
1	2018	3	5	4	4013	2	Off-highway Trucks	23	1	1	414.2073048	g/vehicle per day
1	2018	3	5	4	4013	2	Off-highway Trucks	23	2	1	1308.277242	g/vehicle per day
1	2018	3	5	4	4013	2	Off-highway Trucks	23	3	1	4431.3762	g/vehicle per day
1	2018	3	5	4	4013	2	Off-highway Trucks	23	79	1	374.1223469	g/vehicle per day
1	2018	3	5	4	4013	2	Off-highway Trucks	23	87	1	485.0542246	g/vehicle per day
1	2018	3	5	4	4013	2	Off-highway Trucks	23	100	1	132.8092234	g/vehicle per day
1	2018	4	5	4	4013	2	Off-highway Trucks	23	1	1	428.0144716	g/vehicle per day
1	2018	4	5	4	4013	2	Off-highway Trucks	23	2	1	1351.886632	g/vehicle per day
1	2018	4	5	4	4013	2	Off-highway Trucks	23	3	1	4579.088008	g/vehicle per day
1	2018	4	5	4	4013	2	Off-highway Trucks	23	79	1	386.5935072	g/vehicle per day
1	2018	4	5	4	4013	2	Off-highway Trucks	23	87	1	501.222736	g/vehicle per day
1	2018	4	5	4	4013	2	Off-highway Trucks	23	100	1	137.2361922	g/vehicle per day
1	2018	5	5	4	4013	2	Off-highway Trucks	23	1	1	414.2073048	g/vehicle per day
1	2018	5	5	4	4013	2	Off-highway Trucks	23	2	1	1308.277242	g/vehicle per day
1	2018	5	5	4	4013	2	Off-highway Trucks	23	3	1	4431.3762	g/vehicle per day
1	2018	5	5	4	4013	2	Off-highway Trucks	23	79	1	374.1223469	g/vehicle per day
1	2018	5	5	4	4013	2	Off-highway Trucks	23	87	1	485.0542246	g/vehicle per day
1	2018	5	5	4	4013	2	Off-highway Trucks	23	100	1	132.8092234	g/vehicle per day
1	2018	6	5	4	4013	2	Off-highway Trucks	23	1	1	463.6823718	g/vehicle per day
1	2018	6	5	4	4013	2	Off-highway Trucks	23	2	1	1464.543642	g/vehicle per day
1	2018	6	5	4	4013	2	Off-highway Trucks	23	3	1	4960.684268	g/vehicle per day
1	2018	6	5	4	4013	2	Off-highway Trucks	23	79	1	418.809544	g/vehicle per day
1	2018	6	5	4	4013	2	Off-highway Trucks	23	87	1	542.9916294	g/vehicle per day
1	2018	6	5	4	4013	2	Off-highway Trucks	23	100	1	148.6725952	g/vehicle per day
1	2018	7	5	4	4013	2	Off-highway Trucks	23	1	1	448.7249519	g/vehicle per day
1	2018	7	5	4	4013	2	Off-highway Trucks	23	2	1	1417.300326	g/vehicle per day
1	2018	7	5	4	4013	2	Off-highway Trucks	23	3	1	4800.657497	g/vehicle per day
1	2018	7	5	4	4013	2	Off-highway Trucks	23	79	1	405.299459	g/vehicle per day
1	2018	7	5	4	4013	2	Off-highway Trucks	23	87	1	525.4757753	g/vehicle per day
1	2018	7	5	4	4013	2	Off-highway Trucks	23	100	1	143.8767002	g/vehicle per day
1	2018	8	5	4	4013	2	Off-highway Trucks	23	1	1	448.7249519	g/vehicle per day
1	2018	8	5	4	4013	2	Off-highway Trucks	23	2	1	1417.300326	g/vehicle per day
1	2018	8	5	4	4013	2	Off-highway Trucks	23	3	1	4800.657497	g/vehicle per day
1	2018	8	5	4	4013	2	Off-highway Trucks	23	79	1	405.299459	g/vehicle per day
1	2018	8	5	4	4013	2	Off-highway Trucks	23	87	1	525.4757753	g/vehicle per day
1	2018	8	5	4	4013	2	Off-highway Trucks	23	100	1	143.8767002	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	9	5	4	4013	2	Off-highway Trucks	23	1	1	428.0144716	g/vehicle per day
1	2018	9	5	4	4013	2	Off-highway Trucks	23	2	1	1351.886632	g/vehicle per day
1	2018	9	5	4	4013	2	Off-highway Trucks	23	3	1	4579.088008	g/vehicle per day
1	2018	9	5	4	4013	2	Off-highway Trucks	23	79	1	386.5935072	g/vehicle per day
1	2018	9	5	4	4013	2	Off-highway Trucks	23	87	1	501.222736	g/vehicle per day
1	2018	9	5	4	4013	2	Off-highway Trucks	23	100	1	137.2361922	g/vehicle per day
1	2018	10	5	4	4013	2	Off-highway Trucks	23	1	1	414.2073048	g/vehicle per day
1	2018	10	5	4	4013	2	Off-highway Trucks	23	2	1	1308.277242	g/vehicle per day
1	2018	10	5	4	4013	2	Off-highway Trucks	23	3	1	4431.3762	g/vehicle per day
1	2018	10	5	4	4013	2	Off-highway Trucks	23	79	1	374.1223469	g/vehicle per day
1	2018	10	5	4	4013	2	Off-highway Trucks	23	87	1	485.0542246	g/vehicle per day
1	2018	10	5	4	4013	2	Off-highway Trucks	23	100	1	132.8092234	g/vehicle per day
1	2018	11	5	4	4013	2	Off-highway Trucks	23	1	1	428.0144716	g/vehicle per day
1	2018	11	5	4	4013	2	Off-highway Trucks	23	2	1	1351.886632	g/vehicle per day
1	2018	11	5	4	4013	2	Off-highway Trucks	23	3	1	4579.088008	g/vehicle per day
1	2018	11	5	4	4013	2	Off-highway Trucks	23	79	1	386.5935072	g/vehicle per day
1	2018	11	5	4	4013	2	Off-highway Trucks	23	87	1	501.222736	g/vehicle per day
1	2018	11	5	4	4013	2	Off-highway Trucks	23	100	1	137.2361922	g/vehicle per day
1	2018	12	5	4	4013	2	Off-highway Trucks	23	1	1	369.8280939	g/vehicle per day
1	2018	12	5	4	4013	2	Off-highway Trucks	23	2	1	1168.10504	g/vehicle per day
1	2018	12	5	4	4013	2	Off-highway Trucks	23	3	1	3956.588143	g/vehicle per day
1	2018	12	5	4	4013	2	Off-highway Trucks	23	79	1	334.0379912	g/vehicle per day
1	2018	12	5	4	4013	2	Off-highway Trucks	23	87	1	433.084208	g/vehicle per day
1	2018	12	5	4	4013	2	Off-highway Trucks	23	100	1	118.5796671	g/vehicle per day
2	2018	1	5	4	4013	2	Off-highway Trucks	23	1	1	369.8280939	g/vehicle per day
2	2018	1	5	4	4013	2	Off-highway Trucks	23	2	1	1168.10504	g/vehicle per day
2	2018	1	5	4	4013	2	Off-highway Trucks	23	3	1	3956.588143	g/vehicle per day
2	2018	1	5	4	4013	2	Off-highway Trucks	23	79	1	334.0379912	g/vehicle per day
2	2018	1	5	4	4013	2	Off-highway Trucks	23	87	1	433.084208	g/vehicle per day
2	2018	1	5	4	4013	2	Off-highway Trucks	23	100	1	118.5796671	g/vehicle per day
2	2018	2	5	4	4013	2	Off-highway Trucks	23	1	1	409.4528186	g/vehicle per day
2	2018	2	5	4	4013	2	Off-highway Trucks	23	2	1	1293.259361	g/vehicle per day
2	2018	2	5	4	4013	2	Off-highway Trucks	23	3	1	4380.509682	g/vehicle per day
2	2018	2	5	4	4013	2	Off-highway Trucks	23	79	1	369.8279954	g/vehicle per day
2	2018	2	5	4	4013	2	Off-highway Trucks	23	87	1	479.4862948	g/vehicle per day
2	2018	2	5	4	4013	2	Off-highway Trucks	23	100	1	131.2846602	g/vehicle per day
2	2018	3	5	4	4013	2	Off-highway Trucks	23	1	1	414.2073048	g/vehicle per day
2	2018	3	5	4	4013	2	Off-highway Trucks	23	2	1	1308.277242	g/vehicle per day
2	2018	3	5	4	4013	2	Off-highway Trucks	23	3	1	4431.3762	g/vehicle per day
2	2018	3	5	4	4013	2	Off-highway Trucks	23	79	1	374.1223469	g/vehicle per day
2	2018	3	5	4	4013	2	Off-highway Trucks	23	87	1	485.0542246	g/vehicle per day
2	2018	3	5	4	4013	2	Off-highway Trucks	23	100	1	132.8092234	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	4	5	4	4013	2	Off-highway Trucks	23	1	1	428.0144716	g/vehicle per day
2	2018	4	5	4	4013	2	Off-highway Trucks	23	2	1	1351.886632	g/vehicle per day
2	2018	4	5	4	4013	2	Off-highway Trucks	23	3	1	4579.088008	g/vehicle per day
2	2018	4	5	4	4013	2	Off-highway Trucks	23	79	1	386.5935072	g/vehicle per day
2	2018	4	5	4	4013	2	Off-highway Trucks	23	87	1	501.222736	g/vehicle per day
2	2018	4	5	4	4013	2	Off-highway Trucks	23	100	1	137.2361922	g/vehicle per day
2	2018	5	5	4	4013	2	Off-highway Trucks	23	1	1	414.2073048	g/vehicle per day
2	2018	5	5	4	4013	2	Off-highway Trucks	23	2	1	1308.277242	g/vehicle per day
2	2018	5	5	4	4013	2	Off-highway Trucks	23	3	1	4431.3762	g/vehicle per day
2	2018	5	5	4	4013	2	Off-highway Trucks	23	79	1	374.1223469	g/vehicle per day
2	2018	5	5	4	4013	2	Off-highway Trucks	23	87	1	485.0542246	g/vehicle per day
2	2018	5	5	4	4013	2	Off-highway Trucks	23	100	1	132.8092234	g/vehicle per day
2	2018	6	5	4	4013	2	Off-highway Trucks	23	1	1	463.6823718	g/vehicle per day
2	2018	6	5	4	4013	2	Off-highway Trucks	23	2	1	1464.543642	g/vehicle per day
2	2018	6	5	4	4013	2	Off-highway Trucks	23	3	1	4960.684268	g/vehicle per day
2	2018	6	5	4	4013	2	Off-highway Trucks	23	79	1	418.809544	g/vehicle per day
2	2018	6	5	4	4013	2	Off-highway Trucks	23	87	1	542.9916294	g/vehicle per day
2	2018	6	5	4	4013	2	Off-highway Trucks	23	100	1	148.6725952	g/vehicle per day
2	2018	7	5	4	4013	2	Off-highway Trucks	23	1	1	448.7249519	g/vehicle per day
2	2018	7	5	4	4013	2	Off-highway Trucks	23	2	1	1417.300326	g/vehicle per day
2	2018	7	5	4	4013	2	Off-highway Trucks	23	3	1	4800.657497	g/vehicle per day
2	2018	7	5	4	4013	2	Off-highway Trucks	23	79	1	405.299459	g/vehicle per day
2	2018	7	5	4	4013	2	Off-highway Trucks	23	87	1	525.4757753	g/vehicle per day
2	2018	7	5	4	4013	2	Off-highway Trucks	23	100	1	143.8767002	g/vehicle per day
2	2018	8	5	4	4013	2	Off-highway Trucks	23	1	1	448.7249519	g/vehicle per day
2	2018	8	5	4	4013	2	Off-highway Trucks	23	2	1	1417.300326	g/vehicle per day
2	2018	8	5	4	4013	2	Off-highway Trucks	23	3	1	4800.657497	g/vehicle per day
2	2018	8	5	4	4013	2	Off-highway Trucks	23	79	1	405.299459	g/vehicle per day
2	2018	8	5	4	4013	2	Off-highway Trucks	23	87	1	525.4757753	g/vehicle per day
2	2018	8	5	4	4013	2	Off-highway Trucks	23	100	1	143.8767002	g/vehicle per day
2	2018	9	5	4	4013	2	Off-highway Trucks	23	1	1	428.0144716	g/vehicle per day
2	2018	9	5	4	4013	2	Off-highway Trucks	23	2	1	1351.886632	g/vehicle per day
2	2018	9	5	4	4013	2	Off-highway Trucks	23	3	1	4579.088008	g/vehicle per day
2	2018	9	5	4	4013	2	Off-highway Trucks	23	79	1	386.5935072	g/vehicle per day
2	2018	9	5	4	4013	2	Off-highway Trucks	23	87	1	501.222736	g/vehicle per day
2	2018	9	5	4	4013	2	Off-highway Trucks	23	100	1	137.2361922	g/vehicle per day
2	2018	10	5	4	4013	2	Off-highway Trucks	23	1	1	414.2073048	g/vehicle per day
2	2018	10	5	4	4013	2	Off-highway Trucks	23	2	1	1308.277242	g/vehicle per day
2	2018	10	5	4	4013	2	Off-highway Trucks	23	3	1	4431.3762	g/vehicle per day
2	2018	10	5	4	4013	2	Off-highway Trucks	23	79	1	374.1223469	g/vehicle per day
2	2018	10	5	4	4013	2	Off-highway Trucks	23	87	1	485.0542246	g/vehicle per day
2	2018	10	5	4	4013	2	Off-highway Trucks	23	100	1	132.8092234	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	11	5	4	4013	2	Off-highway Trucks	23	1	1	428.0144716	g/vehicle per day
2	2018	11	5	4	4013	2	Off-highway Trucks	23	2	1	1351.886632	g/vehicle per day
2	2018	11	5	4	4013	2	Off-highway Trucks	23	3	1	4579.088008	g/vehicle per day
2	2018	11	5	4	4013	2	Off-highway Trucks	23	79	1	386.5935072	g/vehicle per day
2	2018	11	5	4	4013	2	Off-highway Trucks	23	87	1	501.222736	g/vehicle per day
2	2018	11	5	4	4013	2	Off-highway Trucks	23	100	1	137.2361922	g/vehicle per day
2	2018	12	5	4	4013	2	Off-highway Trucks	23	1	1	369.8280939	g/vehicle per day
2	2018	12	5	4	4013	2	Off-highway Trucks	23	2	1	1168.10504	g/vehicle per day
2	2018	12	5	4	4013	2	Off-highway Trucks	23	3	1	3956.588143	g/vehicle per day
2	2018	12	5	4	4013	2	Off-highway Trucks	23	79	1	334.0379912	g/vehicle per day
2	2018	12	5	4	4013	2	Off-highway Trucks	23	87	1	433.084208	g/vehicle per day
2	2018	12	5	4	4013	2	Off-highway Trucks	23	100	1	118.5796671	g/vehicle per day
2	2019	1	5	4	4013	2	Off-highway Trucks	23	1	1	350.0027544	g/vehicle per day
2	2019	1	5	4	4013	2	Off-highway Trucks	23	2	1	962.6007622	g/vehicle per day
2	2019	1	5	4	4013	2	Off-highway Trucks	23	3	1	3746.918789	g/vehicle per day
2	2019	1	5	4	4013	2	Off-highway Trucks	23	79	1	315.9283032	g/vehicle per day
2	2019	1	5	4	4013	2	Off-highway Trucks	23	87	1	410.6355375	g/vehicle per day
2	2019	1	5	4	4013	2	Off-highway Trucks	23	100	1	100.5188753	g/vehicle per day
2	2019	2	5	4	4013	2	Off-highway Trucks	23	1	1	387.5031514	g/vehicle per day
2	2019	2	5	4	4013	2	Off-highway Trucks	23	2	1	1065.7365	g/vehicle per day
2	2019	2	5	4	4013	2	Off-highway Trucks	23	3	1	4148.375166	g/vehicle per day
2	2019	2	5	4	4013	2	Off-highway Trucks	23	79	1	349.7778983	g/vehicle per day
2	2019	2	5	4	4013	2	Off-highway Trucks	23	87	1	454.6322638	g/vehicle per day
2	2019	2	5	4	4013	2	Off-highway Trucks	23	100	1	111.288811	g/vehicle per day
2	2019	3	5	4	4013	2	Off-highway Trucks	23	1	1	392.0031433	g/vehicle per day
2	2019	3	5	4	4013	2	Off-highway Trucks	23	2	1	1078.112354	g/vehicle per day
2	2019	3	5	4	4013	2	Off-highway Trucks	23	3	1	4196.547495	g/vehicle per day
2	2019	3	5	4	4013	2	Off-highway Trucks	23	79	1	353.8397112	g/vehicle per day
2	2019	3	5	4	4013	2	Off-highway Trucks	23	87	1	459.9118144	g/vehicle per day
2	2019	3	5	4	4013	2	Off-highway Trucks	23	100	1	112.5811721	g/vehicle per day
2	2019	4	5	4	4013	2	Off-highway Trucks	23	1	1	405.0695557	g/vehicle per day
2	2019	4	5	4	4013	2	Off-highway Trucks	23	2	1	1114.049669	g/vehicle per day
2	2019	4	5	4	4013	2	Off-highway Trucks	23	3	1	4336.432559	g/vehicle per day
2	2019	4	5	4	4013	2	Off-highway Trucks	23	79	1	365.6341703	g/vehicle per day
2	2019	4	5	4	4013	2	Off-highway Trucks	23	87	1	475.2417566	g/vehicle per day
2	2019	4	5	4	4013	2	Off-highway Trucks	23	100	1	116.3338542	g/vehicle per day
2	2019	5	5	4	4013	2	Off-highway Trucks	23	1	1	392.0031433	g/vehicle per day
2	2019	5	5	4	4013	2	Off-highway Trucks	23	2	1	1078.112354	g/vehicle per day
2	2019	5	5	4	4013	2	Off-highway Trucks	23	3	1	4196.547495	g/vehicle per day
2	2019	5	5	4	4013	2	Off-highway Trucks	23	79	1	353.8397112	g/vehicle per day
2	2019	5	5	4	4013	2	Off-highway Trucks	23	87	1	459.9118144	g/vehicle per day
2	2019	5	5	4	4013	2	Off-highway Trucks	23	100	1	112.5811721	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	6	5	4	4013	2	Off-highway Trucks	23	1	1	438.8257099	g/vehicle per day
2	2019	6	5	4	4013	2	Off-highway Trucks	23	2	1	1206.886914	g/vehicle per day
2	2019	6	5	4	4013	2	Off-highway Trucks	23	3	1	4697.806788	g/vehicle per day
2	2019	6	5	4	4013	2	Off-highway Trucks	23	79	1	396.1037166	g/vehicle per day
2	2019	6	5	4	4013	2	Off-highway Trucks	23	87	1	514.8455689	g/vehicle per day
2	2019	6	5	4	4013	2	Off-highway Trucks	23	100	1	126.0283803	g/vehicle per day
2	2019	7	5	4	4013	2	Off-highway Trucks	23	1	1	424.6700107	g/vehicle per day
2	2019	7	5	4	4013	2	Off-highway Trucks	23	2	1	1167.955545	g/vehicle per day
2	2019	7	5	4	4013	2	Off-highway Trucks	23	3	1	4546.261298	g/vehicle per day
2	2019	7	5	4	4013	2	Off-highway Trucks	23	79	1	383.3263846	g/vehicle per day
2	2019	7	5	4	4013	2	Off-highway Trucks	23	87	1	498.2376781	g/vehicle per day
2	2019	7	5	4	4013	2	Off-highway Trucks	23	100	1	121.9629053	g/vehicle per day
2	2019	8	5	4	4013	2	Off-highway Trucks	23	1	1	424.6700107	g/vehicle per day
2	2019	8	5	4	4013	2	Off-highway Trucks	23	2	1	1167.955545	g/vehicle per day
2	2019	8	5	4	4013	2	Off-highway Trucks	23	3	1	4546.261298	g/vehicle per day
2	2019	8	5	4	4013	2	Off-highway Trucks	23	79	1	383.3263846	g/vehicle per day
2	2019	8	5	4	4013	2	Off-highway Trucks	23	87	1	498.2376781	g/vehicle per day
2	2019	8	5	4	4013	2	Off-highway Trucks	23	100	1	121.9629053	g/vehicle per day
2	2019	9	5	4	4013	2	Off-highway Trucks	23	1	1	405.0695557	g/vehicle per day
2	2019	9	5	4	4013	2	Off-highway Trucks	23	2	1	1114.049669	g/vehicle per day
2	2019	9	5	4	4013	2	Off-highway Trucks	23	3	1	4336.432559	g/vehicle per day
2	2019	9	5	4	4013	2	Off-highway Trucks	23	79	1	365.6341703	g/vehicle per day
2	2019	9	5	4	4013	2	Off-highway Trucks	23	87	1	475.2417566	g/vehicle per day
2	2019	9	5	4	4013	2	Off-highway Trucks	23	100	1	116.3338542	g/vehicle per day
2	2019	10	5	4	4013	2	Off-highway Trucks	23	1	1	392.0031433	g/vehicle per day
2	2019	10	5	4	4013	2	Off-highway Trucks	23	2	1	1078.112354	g/vehicle per day
2	2019	10	5	4	4013	2	Off-highway Trucks	23	3	1	4196.547495	g/vehicle per day
2	2019	10	5	4	4013	2	Off-highway Trucks	23	79	1	353.8397112	g/vehicle per day
2	2019	10	5	4	4013	2	Off-highway Trucks	23	87	1	459.9118144	g/vehicle per day
2	2019	10	5	4	4013	2	Off-highway Trucks	23	100	1	112.5811721	g/vehicle per day
2	2019	11	5	4	4013	2	Off-highway Trucks	23	1	1	405.0695557	g/vehicle per day
2	2019	11	5	4	4013	2	Off-highway Trucks	23	2	1	1114.049669	g/vehicle per day
2	2019	11	5	4	4013	2	Off-highway Trucks	23	3	1	4336.432559	g/vehicle per day
2	2019	11	5	4	4013	2	Off-highway Trucks	23	79	1	365.6341703	g/vehicle per day
2	2019	11	5	4	4013	2	Off-highway Trucks	23	87	1	475.2417566	g/vehicle per day
2	2019	11	5	4	4013	2	Off-highway Trucks	23	100	1	116.3338542	g/vehicle per day
2	2019	12	5	4	4013	2	Off-highway Trucks	23	1	1	350.0027544	g/vehicle per day
2	2019	12	5	4	4013	2	Off-highway Trucks	23	2	1	962.6007622	g/vehicle per day
2	2019	12	5	4	4013	2	Off-highway Trucks	23	3	1	3746.918789	g/vehicle per day
2	2019	12	5	4	4013	2	Off-highway Trucks	23	79	1	315.9283032	g/vehicle per day
2	2019	12	5	4	4013	2	Off-highway Trucks	23	87	1	410.6355375	g/vehicle per day
2	2019	12	5	4	4013	2	Off-highway Trucks	23	100	1	100.5188753	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	1	5	4	4013	2	Pavers	23	1	1	29.00892682	g/vehicle per day
2	2017	1	5	4	4013	2	Pavers	23	2	1	144.1101389	g/vehicle per day
2	2017	1	5	4	4013	2	Pavers	23	3	1	318.1532101	g/vehicle per day
2	2017	1	5	4	4013	2	Pavers	23	79	1	26.38307396	g/vehicle per day
2	2017	1	5	4	4013	2	Pavers	23	87	1	32.9582832	g/vehicle per day
2	2017	1	5	4	4013	2	Pavers	23	100	1	23.73171713	g/vehicle per day
2	2017	2	5	4	4013	2	Pavers	23	1	1	32.11702545	g/vehicle per day
2	2017	2	5	4	4013	2	Pavers	23	2	1	159.5505075	g/vehicle per day
2	2017	2	5	4	4013	2	Pavers	23	3	1	352.2409506	g/vehicle per day
2	2017	2	5	4	4013	2	Pavers	23	79	1	29.20983513	g/vehicle per day
2	2017	2	5	4	4013	2	Pavers	23	87	1	36.48952642	g/vehicle per day
2	2017	2	5	4	4013	2	Pavers	23	100	1	26.27441483	g/vehicle per day
2	2017	3	5	4	4013	2	Pavers	23	1	1	32.48998872	g/vehicle per day
2	2017	3	5	4	4013	2	Pavers	23	2	1	161.4032732	g/vehicle per day
2	2017	3	5	4	4013	2	Pavers	23	3	1	356.3314393	g/vehicle per day
2	2017	3	5	4	4013	2	Pavers	23	79	1	29.54903848	g/vehicle per day
2	2017	3	5	4	4013	2	Pavers	23	87	1	36.91326242	g/vehicle per day
2	2017	3	5	4	4013	2	Pavers	23	100	1	26.57951833	g/vehicle per day
2	2017	4	5	4	4013	2	Pavers	23	1	1	33.57298771	g/vehicle per day
2	2017	4	5	4	4013	2	Pavers	23	2	1	166.7834377	g/vehicle per day
2	2017	4	5	4	4013	2	Pavers	23	3	1	368.2091218	g/vehicle per day
2	2017	4	5	4	4013	2	Pavers	23	79	1	30.53399782	g/vehicle per day
2	2017	4	5	4	4013	2	Pavers	23	87	1	38.14370889	g/vehicle per day
2	2017	4	5	4	4013	2	Pavers	23	100	1	27.46551815	g/vehicle per day
2	2017	5	5	4	4013	2	Pavers	23	1	1	32.48998872	g/vehicle per day
2	2017	5	5	4	4013	2	Pavers	23	2	1	161.4032732	g/vehicle per day
2	2017	5	5	4	4013	2	Pavers	23	3	1	356.3314393	g/vehicle per day
2	2017	5	5	4	4013	2	Pavers	23	79	1	29.54903848	g/vehicle per day
2	2017	5	5	4	4013	2	Pavers	23	87	1	36.91326242	g/vehicle per day
2	2017	5	5	4	4013	2	Pavers	23	100	1	26.57951833	g/vehicle per day
2	2017	6	5	4	4013	2	Pavers	23	1	1	36.37074572	g/vehicle per day
2	2017	6	5	4	4013	2	Pavers	23	2	1	180.6820409	g/vehicle per day
2	2017	6	5	4	4013	2	Pavers	23	3	1	398.8931799	g/vehicle per day
2	2017	6	5	4	4013	2	Pavers	23	79	1	33.07851355	g/vehicle per day
2	2017	6	5	4	4013	2	Pavers	23	87	1	41.32236387	g/vehicle per day
2	2017	6	5	4	4013	2	Pavers	23	100	1	29.75430174	g/vehicle per day
2	2017	7	5	4	4013	2	Pavers	23	1	1	35.19749105	g/vehicle per day
2	2017	7	5	4	4013	2	Pavers	23	2	1	174.8535462	g/vehicle per day
2	2017	7	5	4	4013	2	Pavers	23	3	1	386.0258473	g/vehicle per day
2	2017	7	5	4	4013	2	Pavers	23	79	1	32.01145606	g/vehicle per day
2	2017	7	5	4	4013	2	Pavers	23	87	1	39.989381	g/vehicle per day
2	2017	7	5	4	4013	2	Pavers	23	100	1	28.79448354	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	8	5	4	4013	2	Pavers	23	1	1	35.19749105	g/vehicle per day
2	2017	8	5	4	4013	2	Pavers	23	2	1	174.8535462	g/vehicle per day
2	2017	8	5	4	4013	2	Pavers	23	3	1	386.0258473	g/vehicle per day
2	2017	8	5	4	4013	2	Pavers	23	79	1	32.01145606	g/vehicle per day
2	2017	8	5	4	4013	2	Pavers	23	87	1	39.989381	g/vehicle per day
2	2017	8	5	4	4013	2	Pavers	23	100	1	28.79448354	g/vehicle per day
2	2017	9	5	4	4013	2	Pavers	23	1	1	33.57298771	g/vehicle per day
2	2017	9	5	4	4013	2	Pavers	23	2	1	166.7834377	g/vehicle per day
2	2017	9	5	4	4013	2	Pavers	23	3	1	368.2091218	g/vehicle per day
2	2017	9	5	4	4013	2	Pavers	23	79	1	30.53399782	g/vehicle per day
2	2017	9	5	4	4013	2	Pavers	23	87	1	38.14370889	g/vehicle per day
2	2017	9	5	4	4013	2	Pavers	23	100	1	27.46551815	g/vehicle per day
2	2017	10	5	4	4013	2	Pavers	23	1	1	32.48998872	g/vehicle per day
2	2017	10	5	4	4013	2	Pavers	23	2	1	161.4032732	g/vehicle per day
2	2017	10	5	4	4013	2	Pavers	23	3	1	356.3314393	g/vehicle per day
2	2017	10	5	4	4013	2	Pavers	23	79	1	29.54903848	g/vehicle per day
2	2017	10	5	4	4013	2	Pavers	23	87	1	36.91326242	g/vehicle per day
2	2017	10	5	4	4013	2	Pavers	23	100	1	26.57951833	g/vehicle per day
2	2017	11	5	4	4013	2	Pavers	23	1	1	33.57298771	g/vehicle per day
2	2017	11	5	4	4013	2	Pavers	23	2	1	166.7834377	g/vehicle per day
2	2017	11	5	4	4013	2	Pavers	23	3	1	368.2091218	g/vehicle per day
2	2017	11	5	4	4013	2	Pavers	23	79	1	30.53399782	g/vehicle per day
2	2017	11	5	4	4013	2	Pavers	23	87	1	38.14370889	g/vehicle per day
2	2017	11	5	4	4013	2	Pavers	23	100	1	27.46551815	g/vehicle per day
2	2017	12	5	4	4013	2	Pavers	23	1	1	29.00892682	g/vehicle per day
2	2017	12	5	4	4013	2	Pavers	23	2	1	144.1101389	g/vehicle per day
2	2017	12	5	4	4013	2	Pavers	23	3	1	318.1532101	g/vehicle per day
2	2017	12	5	4	4013	2	Pavers	23	79	1	26.38307396	g/vehicle per day
2	2017	12	5	4	4013	2	Pavers	23	87	1	32.9582832	g/vehicle per day
2	2017	12	5	4	4013	2	Pavers	23	100	1	23.73171713	g/vehicle per day
1	2018	1	5	4	4013	2	Pavers	23	1	1	27.36875616	g/vehicle per day
1	2018	1	5	4	4013	2	Pavers	23	2	1	121.4004116	g/vehicle per day
1	2018	1	5	4	4013	2	Pavers	23	3	1	278.3272193	g/vehicle per day
1	2018	1	5	4	4013	2	Pavers	23	79	1	24.83161321	g/vehicle per day
1	2018	1	5	4	4013	2	Pavers	23	87	1	31.26029818	g/vehicle per day
1	2018	1	5	4	4013	2	Pavers	23	100	1	19.40731677	g/vehicle per day
1	2018	2	5	4	4013	2	Pavers	23	1	1	30.3011321	g/vehicle per day
1	2018	2	5	4	4013	2	Pavers	23	2	1	134.407544	g/vehicle per day
1	2018	2	5	4	4013	2	Pavers	23	3	1	308.1480451	g/vehicle per day
1	2018	2	5	4	4013	2	Pavers	23	79	1	27.4921461	g/vehicle per day
1	2018	2	5	4	4013	2	Pavers	23	87	1	34.6096263	g/vehicle per day
1	2018	2	5	4	4013	2	Pavers	23	100	1	21.48666346	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	3	5	4	4013	2	Pavers	23	1	1	30.65301667	g/vehicle per day
1	2018	3	5	4	4013	2	Pavers	23	2	1	135.9684135	g/vehicle per day
1	2018	3	5	4	4013	2	Pavers	23	3	1	311.7263154	g/vehicle per day
1	2018	3	5	4	4013	2	Pavers	23	79	1	27.8114144	g/vehicle per day
1	2018	3	5	4	4013	2	Pavers	23	87	1	35.01153911	g/vehicle per day
1	2018	3	5	4	4013	2	Pavers	23	100	1	21.73618429	g/vehicle per day
1	2018	4	5	4	4013	2	Pavers	23	1	1	31.67477604	g/vehicle per day
1	2018	4	5	4	4013	2	Pavers	23	2	1	140.5006862	g/vehicle per day
1	2018	4	5	4	4013	2	Pavers	23	3	1	322.117267	g/vehicle per day
1	2018	4	5	4	4013	2	Pavers	23	79	1	28.73846281	g/vehicle per day
1	2018	4	5	4	4013	2	Pavers	23	87	1	36.17858238	g/vehicle per day
1	2018	4	5	4	4013	2	Pavers	23	100	1	22.46072352	g/vehicle per day
1	2018	5	5	4	4013	2	Pavers	23	1	1	30.65301667	g/vehicle per day
1	2018	5	5	4	4013	2	Pavers	23	2	1	135.9684135	g/vehicle per day
1	2018	5	5	4	4013	2	Pavers	23	3	1	311.7263154	g/vehicle per day
1	2018	5	5	4	4013	2	Pavers	23	79	1	27.8114144	g/vehicle per day
1	2018	5	5	4	4013	2	Pavers	23	87	1	35.01153911	g/vehicle per day
1	2018	5	5	4	4013	2	Pavers	23	100	1	21.73618429	g/vehicle per day
1	2018	6	5	4	4013	2	Pavers	23	1	1	34.31434406	g/vehicle per day
1	2018	6	5	4	4013	2	Pavers	23	2	1	152.2090614	g/vehicle per day
1	2018	6	5	4	4013	2	Pavers	23	3	1	348.9604094	g/vehicle per day
1	2018	6	5	4	4013	2	Pavers	23	79	1	31.13333187	g/vehicle per day
1	2018	6	5	4	4013	2	Pavers	23	87	1	39.19346948	g/vehicle per day
1	2018	6	5	4	4013	2	Pavers	23	100	1	24.33245291	g/vehicle per day
1	2018	7	5	4	4013	2	Pavers	23	1	1	33.2074381	g/vehicle per day
1	2018	7	5	4	4013	2	Pavers	23	2	1	147.2991115	g/vehicle per day
1	2018	7	5	4	4013	2	Pavers	23	3	1	337.7036358	g/vehicle per day
1	2018	7	5	4	4013	2	Pavers	23	79	1	30.12903754	g/vehicle per day
1	2018	7	5	4	4013	2	Pavers	23	87	1	37.9291722	g/vehicle per day
1	2018	7	5	4	4013	2	Pavers	23	100	1	23.54751713	g/vehicle per day
1	2018	8	5	4	4013	2	Pavers	23	1	1	33.2074381	g/vehicle per day
1	2018	8	5	4	4013	2	Pavers	23	2	1	147.2991115	g/vehicle per day
1	2018	8	5	4	4013	2	Pavers	23	3	1	337.7036358	g/vehicle per day
1	2018	8	5	4	4013	2	Pavers	23	79	1	30.12903754	g/vehicle per day
1	2018	8	5	4	4013	2	Pavers	23	87	1	37.9291722	g/vehicle per day
1	2018	8	5	4	4013	2	Pavers	23	100	1	23.54751713	g/vehicle per day
1	2018	9	5	4	4013	2	Pavers	23	1	1	31.67477604	g/vehicle per day
1	2018	9	5	4	4013	2	Pavers	23	2	1	140.5006862	g/vehicle per day
1	2018	9	5	4	4013	2	Pavers	23	3	1	322.117267	g/vehicle per day
1	2018	9	5	4	4013	2	Pavers	23	79	1	28.73846281	g/vehicle per day
1	2018	9	5	4	4013	2	Pavers	23	87	1	36.17858238	g/vehicle per day
1	2018	9	5	4	4013	2	Pavers	23	100	1	22.46072352	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	10	5	4	4013	2	Pavers	23	1	1	30.65301667	g/vehicle per day
1	2018	10	5	4	4013	2	Pavers	23	2	1	135.9684135	g/vehicle per day
1	2018	10	5	4	4013	2	Pavers	23	3	1	311.7263154	g/vehicle per day
1	2018	10	5	4	4013	2	Pavers	23	79	1	27.8114144	g/vehicle per day
1	2018	10	5	4	4013	2	Pavers	23	87	1	35.01153911	g/vehicle per day
1	2018	10	5	4	4013	2	Pavers	23	100	1	21.73618429	g/vehicle per day
1	2018	11	5	4	4013	2	Pavers	23	1	1	31.67477604	g/vehicle per day
1	2018	11	5	4	4013	2	Pavers	23	2	1	140.5006862	g/vehicle per day
1	2018	11	5	4	4013	2	Pavers	23	3	1	322.117267	g/vehicle per day
1	2018	11	5	4	4013	2	Pavers	23	79	1	28.73846281	g/vehicle per day
1	2018	11	5	4	4013	2	Pavers	23	87	1	36.17858238	g/vehicle per day
1	2018	11	5	4	4013	2	Pavers	23	100	1	22.46072352	g/vehicle per day
1	2018	12	5	4	4013	2	Pavers	23	1	1	27.36875616	g/vehicle per day
1	2018	12	5	4	4013	2	Pavers	23	2	1	121.4004116	g/vehicle per day
1	2018	12	5	4	4013	2	Pavers	23	3	1	278.3272193	g/vehicle per day
1	2018	12	5	4	4013	2	Pavers	23	79	1	24.83161321	g/vehicle per day
1	2018	12	5	4	4013	2	Pavers	23	87	1	31.26029818	g/vehicle per day
1	2018	12	5	4	4013	2	Pavers	23	100	1	19.40731677	g/vehicle per day
2	2018	1	5	4	4013	2	Pavers	23	1	1	27.36875616	g/vehicle per day
2	2018	1	5	4	4013	2	Pavers	23	2	1	121.4004116	g/vehicle per day
2	2018	1	5	4	4013	2	Pavers	23	3	1	278.3272193	g/vehicle per day
2	2018	1	5	4	4013	2	Pavers	23	79	1	24.83161321	g/vehicle per day
2	2018	1	5	4	4013	2	Pavers	23	87	1	31.26029818	g/vehicle per day
2	2018	1	5	4	4013	2	Pavers	23	100	1	19.40731677	g/vehicle per day
2	2018	2	5	4	4013	2	Pavers	23	1	1	30.3011321	g/vehicle per day
2	2018	2	5	4	4013	2	Pavers	23	2	1	134.407544	g/vehicle per day
2	2018	2	5	4	4013	2	Pavers	23	3	1	308.1480451	g/vehicle per day
2	2018	2	5	4	4013	2	Pavers	23	79	1	27.4921461	g/vehicle per day
2	2018	2	5	4	4013	2	Pavers	23	87	1	34.6096263	g/vehicle per day
2	2018	2	5	4	4013	2	Pavers	23	100	1	21.48666346	g/vehicle per day
2	2018	3	5	4	4013	2	Pavers	23	1	1	30.65301667	g/vehicle per day
2	2018	3	5	4	4013	2	Pavers	23	2	1	135.9684135	g/vehicle per day
2	2018	3	5	4	4013	2	Pavers	23	3	1	311.7263154	g/vehicle per day
2	2018	3	5	4	4013	2	Pavers	23	79	1	27.8114144	g/vehicle per day
2	2018	3	5	4	4013	2	Pavers	23	87	1	35.01153911	g/vehicle per day
2	2018	3	5	4	4013	2	Pavers	23	100	1	21.73618429	g/vehicle per day
2	2018	4	5	4	4013	2	Pavers	23	1	1	31.67477604	g/vehicle per day
2	2018	4	5	4	4013	2	Pavers	23	2	1	140.5006862	g/vehicle per day
2	2018	4	5	4	4013	2	Pavers	23	3	1	322.117267	g/vehicle per day
2	2018	4	5	4	4013	2	Pavers	23	79	1	28.73846281	g/vehicle per day
2	2018	4	5	4	4013	2	Pavers	23	87	1	36.17858238	g/vehicle per day
2	2018	4	5	4	4013	2	Pavers	23	100	1	22.46072352	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	5	5	4	4013	2	Pavers	23	1	1	30.65301667	g/vehicle per day
2	2018	5	5	4	4013	2	Pavers	23	2	1	135.9684135	g/vehicle per day
2	2018	5	5	4	4013	2	Pavers	23	3	1	311.7263154	g/vehicle per day
2	2018	5	5	4	4013	2	Pavers	23	79	1	27.8114144	g/vehicle per day
2	2018	5	5	4	4013	2	Pavers	23	87	1	35.01153911	g/vehicle per day
2	2018	5	5	4	4013	2	Pavers	23	100	1	21.73618429	g/vehicle per day
2	2018	6	5	4	4013	2	Pavers	23	1	1	34.31434406	g/vehicle per day
2	2018	6	5	4	4013	2	Pavers	23	2	1	152.2090614	g/vehicle per day
2	2018	6	5	4	4013	2	Pavers	23	3	1	348.9604094	g/vehicle per day
2	2018	6	5	4	4013	2	Pavers	23	79	1	31.13333187	g/vehicle per day
2	2018	6	5	4	4013	2	Pavers	23	87	1	39.19346948	g/vehicle per day
2	2018	6	5	4	4013	2	Pavers	23	100	1	24.33245291	g/vehicle per day
2	2018	7	5	4	4013	2	Pavers	23	1	1	33.2074381	g/vehicle per day
2	2018	7	5	4	4013	2	Pavers	23	2	1	147.2991115	g/vehicle per day
2	2018	7	5	4	4013	2	Pavers	23	3	1	337.7036358	g/vehicle per day
2	2018	7	5	4	4013	2	Pavers	23	79	1	30.12903754	g/vehicle per day
2	2018	7	5	4	4013	2	Pavers	23	87	1	37.9291722	g/vehicle per day
2	2018	7	5	4	4013	2	Pavers	23	100	1	23.54751713	g/vehicle per day
2	2018	8	5	4	4013	2	Pavers	23	1	1	33.2074381	g/vehicle per day
2	2018	8	5	4	4013	2	Pavers	23	2	1	147.2991115	g/vehicle per day
2	2018	8	5	4	4013	2	Pavers	23	3	1	337.7036358	g/vehicle per day
2	2018	8	5	4	4013	2	Pavers	23	79	1	30.12903754	g/vehicle per day
2	2018	8	5	4	4013	2	Pavers	23	87	1	37.9291722	g/vehicle per day
2	2018	8	5	4	4013	2	Pavers	23	100	1	23.54751713	g/vehicle per day
2	2018	9	5	4	4013	2	Pavers	23	1	1	31.67477604	g/vehicle per day
2	2018	9	5	4	4013	2	Pavers	23	2	1	140.5006862	g/vehicle per day
2	2018	9	5	4	4013	2	Pavers	23	3	1	322.117267	g/vehicle per day
2	2018	9	5	4	4013	2	Pavers	23	79	1	28.73846281	g/vehicle per day
2	2018	9	5	4	4013	2	Pavers	23	87	1	36.17858238	g/vehicle per day
2	2018	9	5	4	4013	2	Pavers	23	100	1	22.46072352	g/vehicle per day
2	2018	10	5	4	4013	2	Pavers	23	1	1	30.65301667	g/vehicle per day
2	2018	10	5	4	4013	2	Pavers	23	2	1	135.9684135	g/vehicle per day
2	2018	10	5	4	4013	2	Pavers	23	3	1	311.7263154	g/vehicle per day
2	2018	10	5	4	4013	2	Pavers	23	79	1	27.8114144	g/vehicle per day
2	2018	10	5	4	4013	2	Pavers	23	87	1	35.01153911	g/vehicle per day
2	2018	10	5	4	4013	2	Pavers	23	100	1	21.73618429	g/vehicle per day
2	2018	11	5	4	4013	2	Pavers	23	1	1	31.67477604	g/vehicle per day
2	2018	11	5	4	4013	2	Pavers	23	2	1	140.5006862	g/vehicle per day
2	2018	11	5	4	4013	2	Pavers	23	3	1	322.117267	g/vehicle per day
2	2018	11	5	4	4013	2	Pavers	23	79	1	28.73846281	g/vehicle per day
2	2018	11	5	4	4013	2	Pavers	23	87	1	36.17858238	g/vehicle per day
2	2018	11	5	4	4013	2	Pavers	23	100	1	22.46072352	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	12	5	4	4013	2	Pavers	23	1	1	27.36875616	g/vehicle per day
2	2018	12	5	4	4013	2	Pavers	23	2	1	121.4004116	g/vehicle per day
2	2018	12	5	4	4013	2	Pavers	23	3	1	278.3272193	g/vehicle per day
2	2018	12	5	4	4013	2	Pavers	23	79	1	24.83161321	g/vehicle per day
2	2018	12	5	4	4013	2	Pavers	23	87	1	31.26029818	g/vehicle per day
2	2018	12	5	4	4013	2	Pavers	23	100	1	19.40731677	g/vehicle per day
2	2019	1	5	4	4013	2	Pavers	23	1	1	26.05009335	g/vehicle per day
2	2019	1	5	4	4013	2	Pavers	23	2	1	100.5317896	g/vehicle per day
2	2019	1	5	4	4013	2	Pavers	23	3	1	243.4659464	g/vehicle per day
2	2019	1	5	4	4013	2	Pavers	23	79	1	23.59213664	g/vehicle per day
2	2019	1	5	4	4013	2	Pavers	23	87	1	29.9057324	g/vehicle per day
2	2019	1	5	4	4013	2	Pavers	23	100	1	15.32433722	g/vehicle per day
2	2019	2	5	4	4013	2	Pavers	23	1	1	28.84118476	g/vehicle per day
2	2019	2	5	4	4013	2	Pavers	23	2	1	111.3030734	g/vehicle per day
2	2019	2	5	4	4013	2	Pavers	23	3	1	269.5515804	g/vehicle per day
2	2019	2	5	4	4013	2	Pavers	23	79	1	26.11987406	g/vehicle per day
2	2019	2	5	4	4013	2	Pavers	23	87	1	33.10993189	g/vehicle per day
2	2019	2	5	4	4013	2	Pavers	23	100	1	16.96623074	g/vehicle per day
2	2019	3	5	4	4013	2	Pavers	23	1	1	29.17610317	g/vehicle per day
2	2019	3	5	4	4013	2	Pavers	23	2	1	112.5955933	g/vehicle per day
2	2019	3	5	4	4013	2	Pavers	23	3	1	272.6817782	g/vehicle per day
2	2019	3	5	4	4013	2	Pavers	23	79	1	26.42319208	g/vehicle per day
2	2019	3	5	4	4013	2	Pavers	23	87	1	33.49442235	g/vehicle per day
2	2019	3	5	4	4013	2	Pavers	23	100	1	17.16326282	g/vehicle per day
2	2019	4	5	4	4013	2	Pavers	23	1	1	30.14863791	g/vehicle per day
2	2019	4	5	4	4013	2	Pavers	23	2	1	116.3487637	g/vehicle per day
2	2019	4	5	4	4013	2	Pavers	23	3	1	281.7712037	g/vehicle per day
2	2019	4	5	4	4013	2	Pavers	23	79	1	27.30396492	g/vehicle per day
2	2019	4	5	4	4013	2	Pavers	23	87	1	34.61089398	g/vehicle per day
2	2019	4	5	4	4013	2	Pavers	23	100	1	17.73537227	g/vehicle per day
2	2019	5	5	4	4013	2	Pavers	23	1	1	29.17610317	g/vehicle per day
2	2019	5	5	4	4013	2	Pavers	23	2	1	112.5955933	g/vehicle per day
2	2019	5	5	4	4013	2	Pavers	23	3	1	272.6817782	g/vehicle per day
2	2019	5	5	4	4013	2	Pavers	23	79	1	26.42319208	g/vehicle per day
2	2019	5	5	4	4013	2	Pavers	23	87	1	33.49442235	g/vehicle per day
2	2019	5	5	4	4013	2	Pavers	23	100	1	17.16326282	g/vehicle per day
2	2019	6	5	4	4013	2	Pavers	23	1	1	32.66103893	g/vehicle per day
2	2019	6	5	4	4013	2	Pavers	23	2	1	126.0445415	g/vehicle per day
2	2019	6	5	4	4013	2	Pavers	23	3	1	305.2522216	g/vehicle per day
2	2019	6	5	4	4013	2	Pavers	23	79	1	29.57931097	g/vehicle per day
2	2019	6	5	4	4013	2	Pavers	23	87	1	37.49515172	g/vehicle per day
2	2019	6	5	4	4013	2	Pavers	23	100	1	19.21333029	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	7	5	4	4013	2	Pavers	23	1	1	31.60744479	g/vehicle per day
2	2019	7	5	4	4013	2	Pavers	23	2	1	121.978568	g/vehicle per day
2	2019	7	5	4	4013	2	Pavers	23	3	1	295.4052794	g/vehicle per day
2	2019	7	5	4	4013	2	Pavers	23	79	1	28.62512721	g/vehicle per day
2	2019	7	5	4	4013	2	Pavers	23	87	1	36.28561991	g/vehicle per day
2	2019	7	5	4	4013	2	Pavers	23	100	1	18.59352018	g/vehicle per day
2	2019	8	5	4	4013	2	Pavers	23	1	1	31.60744479	g/vehicle per day
2	2019	8	5	4	4013	2	Pavers	23	2	1	121.978568	g/vehicle per day
2	2019	8	5	4	4013	2	Pavers	23	3	1	295.4052794	g/vehicle per day
2	2019	8	5	4	4013	2	Pavers	23	79	1	28.62512721	g/vehicle per day
2	2019	8	5	4	4013	2	Pavers	23	87	1	36.28561991	g/vehicle per day
2	2019	8	5	4	4013	2	Pavers	23	100	1	18.59352018	g/vehicle per day
2	2019	9	5	4	4013	2	Pavers	23	1	1	30.14863791	g/vehicle per day
2	2019	9	5	4	4013	2	Pavers	23	2	1	116.3487637	g/vehicle per day
2	2019	9	5	4	4013	2	Pavers	23	3	1	281.7712037	g/vehicle per day
2	2019	9	5	4	4013	2	Pavers	23	79	1	27.30396492	g/vehicle per day
2	2019	9	5	4	4013	2	Pavers	23	87	1	34.61089398	g/vehicle per day
2	2019	9	5	4	4013	2	Pavers	23	100	1	17.73537227	g/vehicle per day
2	2019	10	5	4	4013	2	Pavers	23	1	1	29.17610317	g/vehicle per day
2	2019	10	5	4	4013	2	Pavers	23	2	1	112.5955933	g/vehicle per day
2	2019	10	5	4	4013	2	Pavers	23	3	1	272.6817782	g/vehicle per day
2	2019	10	5	4	4013	2	Pavers	23	79	1	26.42319208	g/vehicle per day
2	2019	10	5	4	4013	2	Pavers	23	87	1	33.49442235	g/vehicle per day
2	2019	10	5	4	4013	2	Pavers	23	100	1	17.16326282	g/vehicle per day
2	2019	11	5	4	4013	2	Pavers	23	1	1	30.14863791	g/vehicle per day
2	2019	11	5	4	4013	2	Pavers	23	2	1	116.3487637	g/vehicle per day
2	2019	11	5	4	4013	2	Pavers	23	3	1	281.7712037	g/vehicle per day
2	2019	11	5	4	4013	2	Pavers	23	79	1	27.30396492	g/vehicle per day
2	2019	11	5	4	4013	2	Pavers	23	87	1	34.61089398	g/vehicle per day
2	2019	11	5	4	4013	2	Pavers	23	100	1	17.73537227	g/vehicle per day
2	2019	12	5	4	4013	2	Pavers	23	1	1	26.05009335	g/vehicle per day
2	2019	12	5	4	4013	2	Pavers	23	2	1	100.5317896	g/vehicle per day
2	2019	12	5	4	4013	2	Pavers	23	3	1	243.4659464	g/vehicle per day
2	2019	12	5	4	4013	2	Pavers	23	79	1	23.59213664	g/vehicle per day
2	2019	12	5	4	4013	2	Pavers	23	87	1	29.9057324	g/vehicle per day
2	2019	12	5	4	4013	2	Pavers	23	100	1	15.32433722	g/vehicle per day
2	2017	1	5	4	4013	2	Paving Equipment	23	1	1	16.08674801	g/vehicle per day
2	2017	1	5	4	4013	2	Paving Equipment	23	2	1	91.43026614	g/vehicle per day
2	2017	1	5	4	4013	2	Paving Equipment	23	3	1	177.7482064	g/vehicle per day
2	2017	1	5	4	4013	2	Paving Equipment	23	79	1	14.75369888	g/vehicle per day
2	2017	1	5	4	4013	2	Paving Equipment	23	87	1	18.0384381	g/vehicle per day
2	2017	1	5	4	4013	2	Paving Equipment	23	100	1	14.3982625	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	2	5	4	4013	2	Paving Equipment	23	1	1	17.81032491	g/vehicle per day
2	2017	2	5	4	4013	2	Paving Equipment	23	2	1	101.2263431	g/vehicle per day
2	2017	2	5	4	4013	2	Paving Equipment	23	3	1	196.7926553	g/vehicle per day
2	2017	2	5	4	4013	2	Paving Equipment	23	79	1	16.33445422	g/vehicle per day
2	2017	2	5	4	4013	2	Paving Equipment	23	87	1	19.97112046	g/vehicle per day
2	2017	2	5	4	4013	2	Paving Equipment	23	100	1	15.94093924	g/vehicle per day
2	2017	3	5	4	4013	2	Paving Equipment	23	1	1	18.01715289	g/vehicle per day
2	2017	3	5	4	4013	2	Paving Equipment	23	2	1	102.4018659	g/vehicle per day
2	2017	3	5	4	4013	2	Paving Equipment	23	3	1	199.0778916	g/vehicle per day
2	2017	3	5	4	4013	2	Paving Equipment	23	79	1	16.52413931	g/vehicle per day
2	2017	3	5	4	4013	2	Paving Equipment	23	87	1	20.2030443	g/vehicle per day
2	2017	3	5	4	4013	2	Paving Equipment	23	100	1	16.12605604	g/vehicle per day
2	2017	4	5	4	4013	2	Paving Equipment	23	1	1	18.61772272	g/vehicle per day
2	2017	4	5	4	4013	2	Paving Equipment	23	2	1	105.8152651	g/vehicle per day
2	2017	4	5	4	4013	2	Paving Equipment	23	3	1	205.7138112	g/vehicle per day
2	2017	4	5	4	4013	2	Paving Equipment	23	79	1	17.07494325	g/vehicle per day
2	2017	4	5	4	4013	2	Paving Equipment	23	87	1	20.87647259	g/vehicle per day
2	2017	4	5	4	4013	2	Paving Equipment	23	100	1	16.66358485	g/vehicle per day
2	2017	5	5	4	4013	2	Paving Equipment	23	1	1	18.01715289	g/vehicle per day
2	2017	5	5	4	4013	2	Paving Equipment	23	2	1	102.4018659	g/vehicle per day
2	2017	5	5	4	4013	2	Paving Equipment	23	3	1	199.0778916	g/vehicle per day
2	2017	5	5	4	4013	2	Paving Equipment	23	79	1	16.52413931	g/vehicle per day
2	2017	5	5	4	4013	2	Paving Equipment	23	87	1	20.2030443	g/vehicle per day
2	2017	5	5	4	4013	2	Paving Equipment	23	100	1	16.12605604	g/vehicle per day
2	2017	6	5	4	4013	2	Paving Equipment	23	1	1	20.16920216	g/vehicle per day
2	2017	6	5	4	4013	2	Paving Equipment	23	2	1	114.6331992	g/vehicle per day
2	2017	6	5	4	4013	2	Paving Equipment	23	3	1	222.8567364	g/vehicle per day
2	2017	6	5	4	4013	2	Paving Equipment	23	79	1	18.49785667	g/vehicle per day
2	2017	6	5	4	4013	2	Paving Equipment	23	87	1	22.61618104	g/vehicle per day
2	2017	6	5	4	4013	2	Paving Equipment	23	100	1	18.05222004	g/vehicle per day
2	2017	7	5	4	4013	2	Paving Equipment	23	1	1	19.5185808	g/vehicle per day
2	2017	7	5	4	4013	2	Paving Equipment	23	2	1	110.9353636	g/vehicle per day
2	2017	7	5	4	4013	2	Paving Equipment	23	3	1	215.6678046	g/vehicle per day
2	2017	7	5	4	4013	2	Paving Equipment	23	79	1	17.90115567	g/vehicle per day
2	2017	7	5	4	4013	2	Paving Equipment	23	87	1	21.8866322	g/vehicle per day
2	2017	7	5	4	4013	2	Paving Equipment	23	100	1	17.46989444	g/vehicle per day
2	2017	8	5	4	4013	2	Paving Equipment	23	1	1	19.5185808	g/vehicle per day
2	2017	8	5	4	4013	2	Paving Equipment	23	2	1	110.9353636	g/vehicle per day
2	2017	8	5	4	4013	2	Paving Equipment	23	3	1	215.6678046	g/vehicle per day
2	2017	8	5	4	4013	2	Paving Equipment	23	79	1	17.90115567	g/vehicle per day
2	2017	8	5	4	4013	2	Paving Equipment	23	87	1	21.8866322	g/vehicle per day
2	2017	8	5	4	4013	2	Paving Equipment	23	100	1	17.46989444	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	9	5	4	4013	2	Paving Equipment	23	1	1	18.61772272	g/vehicle per day
2	2017	9	5	4	4013	2	Paving Equipment	23	2	1	105.8152651	g/vehicle per day
2	2017	9	5	4	4013	2	Paving Equipment	23	3	1	205.7138112	g/vehicle per day
2	2017	9	5	4	4013	2	Paving Equipment	23	79	1	17.07494325	g/vehicle per day
2	2017	9	5	4	4013	2	Paving Equipment	23	87	1	20.87647259	g/vehicle per day
2	2017	9	5	4	4013	2	Paving Equipment	23	100	1	16.66358485	g/vehicle per day
2	2017	10	5	4	4013	2	Paving Equipment	23	1	1	18.01715289	g/vehicle per day
2	2017	10	5	4	4013	2	Paving Equipment	23	2	1	102.4018659	g/vehicle per day
2	2017	10	5	4	4013	2	Paving Equipment	23	3	1	199.0778916	g/vehicle per day
2	2017	10	5	4	4013	2	Paving Equipment	23	79	1	16.52413931	g/vehicle per day
2	2017	10	5	4	4013	2	Paving Equipment	23	87	1	20.2030443	g/vehicle per day
2	2017	10	5	4	4013	2	Paving Equipment	23	100	1	16.12605604	g/vehicle per day
2	2017	11	5	4	4013	2	Paving Equipment	23	1	1	18.61772272	g/vehicle per day
2	2017	11	5	4	4013	2	Paving Equipment	23	2	1	105.8152651	g/vehicle per day
2	2017	11	5	4	4013	2	Paving Equipment	23	3	1	205.7138112	g/vehicle per day
2	2017	11	5	4	4013	2	Paving Equipment	23	79	1	17.07494325	g/vehicle per day
2	2017	11	5	4	4013	2	Paving Equipment	23	87	1	20.87647259	g/vehicle per day
2	2017	11	5	4	4013	2	Paving Equipment	23	100	1	16.66358485	g/vehicle per day
2	2017	12	5	4	4013	2	Paving Equipment	23	1	1	16.08674801	g/vehicle per day
2	2017	12	5	4	4013	2	Paving Equipment	23	2	1	91.43026614	g/vehicle per day
2	2017	12	5	4	4013	2	Paving Equipment	23	3	1	177.7482064	g/vehicle per day
2	2017	12	5	4	4013	2	Paving Equipment	23	79	1	14.75369888	g/vehicle per day
2	2017	12	5	4	4013	2	Paving Equipment	23	87	1	18.0384381	g/vehicle per day
2	2017	12	5	4	4013	2	Paving Equipment	23	100	1	14.3982625	g/vehicle per day
1	2018	1	5	4	4013	2	Paving Equipment	23	1	1	15.00691685	g/vehicle per day
1	2018	1	5	4	4013	2	Paving Equipment	23	2	1	82.11886556	g/vehicle per day
1	2018	1	5	4	4013	2	Paving Equipment	23	3	1	160.1625344	g/vehicle per day
1	2018	1	5	4	4013	2	Paving Equipment	23	79	1	13.72416239	g/vehicle per day
1	2018	1	5	4	4013	2	Paving Equipment	23	87	1	16.89607277	g/vehicle per day
1	2018	1	5	4	4013	2	Paving Equipment	23	100	1	12.88280187	g/vehicle per day
1	2018	2	5	4	4013	2	Paving Equipment	23	1	1	16.61480831	g/vehicle per day
1	2018	2	5	4	4013	2	Paving Equipment	23	2	1	90.91731184	g/vehicle per day
1	2018	2	5	4	4013	2	Paving Equipment	23	3	1	177.322874	g/vehicle per day
1	2018	2	5	4	4013	2	Paving Equipment	23	79	1	15.19462002	g/vehicle per day
1	2018	2	5	4	4013	2	Paving Equipment	23	87	1	18.70637958	g/vehicle per day
1	2018	2	5	4	4013	2	Paving Equipment	23	100	1	14.26310093	g/vehicle per day
1	2018	3	5	4	4013	2	Paving Equipment	23	1	1	16.8077478	g/vehicle per day
1	2018	3	5	4	4013	2	Paving Equipment	23	2	1	91.97310657	g/vehicle per day
1	2018	3	5	4	4013	2	Paving Equipment	23	3	1	179.3820945	g/vehicle per day
1	2018	3	5	4	4013	2	Paving Equipment	23	79	1	15.37106954	g/vehicle per day
1	2018	3	5	4	4013	2	Paving Equipment	23	87	1	18.92360154	g/vehicle per day
1	2018	3	5	4	4013	2	Paving Equipment	23	100	1	14.42873438	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	4	5	4	4013	2	Paving Equipment	23	1	1	17.36800508	g/vehicle per day
1	2018	4	5	4	4013	2	Paving Equipment	23	2	1	95.03889567	g/vehicle per day
1	2018	4	5	4	4013	2	Paving Equipment	23	3	1	185.3614646	g/vehicle per day
1	2018	4	5	4	4013	2	Paving Equipment	23	79	1	15.88343276	g/vehicle per day
1	2018	4	5	4	4013	2	Paving Equipment	23	87	1	19.55438724	g/vehicle per day
1	2018	4	5	4	4013	2	Paving Equipment	23	100	1	14.90969337	g/vehicle per day
1	2018	5	5	4	4013	2	Paving Equipment	23	1	1	16.8077478	g/vehicle per day
1	2018	5	5	4	4013	2	Paving Equipment	23	2	1	91.97310657	g/vehicle per day
1	2018	5	5	4	4013	2	Paving Equipment	23	3	1	179.3820945	g/vehicle per day
1	2018	5	5	4	4013	2	Paving Equipment	23	79	1	15.37106954	g/vehicle per day
1	2018	5	5	4	4013	2	Paving Equipment	23	87	1	18.92360154	g/vehicle per day
1	2018	5	5	4	4013	2	Paving Equipment	23	100	1	14.42873438	g/vehicle per day
1	2018	6	5	4	4013	2	Paving Equipment	23	1	1	18.81534222	g/vehicle per day
1	2018	6	5	4	4013	2	Paving Equipment	23	2	1	102.9587805	g/vehicle per day
1	2018	6	5	4	4013	2	Paving Equipment	23	3	1	200.808267	g/vehicle per day
1	2018	6	5	4	4013	2	Paving Equipment	23	79	1	17.20705517	g/vehicle per day
1	2018	6	5	4	4013	2	Paving Equipment	23	87	1	21.1839244	g/vehicle per day
1	2018	6	5	4	4013	2	Paving Equipment	23	100	1	16.15216968	g/vehicle per day
1	2018	7	5	4	4013	2	Paving Equipment	23	1	1	18.20838908	g/vehicle per day
1	2018	7	5	4	4013	2	Paving Equipment	23	2	1	99.63753649	g/vehicle per day
1	2018	7	5	4	4013	2	Paving Equipment	23	3	1	194.3305745	g/vehicle per day
1	2018	7	5	4	4013	2	Paving Equipment	23	79	1	16.65198381	g/vehicle per day
1	2018	7	5	4	4013	2	Paving Equipment	23	87	1	20.5005658	g/vehicle per day
1	2018	7	5	4	4013	2	Paving Equipment	23	100	1	15.6311279	g/vehicle per day
1	2018	8	5	4	4013	2	Paving Equipment	23	1	1	18.20838908	g/vehicle per day
1	2018	8	5	4	4013	2	Paving Equipment	23	2	1	99.63753649	g/vehicle per day
1	2018	8	5	4	4013	2	Paving Equipment	23	3	1	194.3305745	g/vehicle per day
1	2018	8	5	4	4013	2	Paving Equipment	23	79	1	16.65198381	g/vehicle per day
1	2018	8	5	4	4013	2	Paving Equipment	23	87	1	20.5005658	g/vehicle per day
1	2018	8	5	4	4013	2	Paving Equipment	23	100	1	15.6311279	g/vehicle per day
1	2018	9	5	4	4013	2	Paving Equipment	23	1	1	17.36800508	g/vehicle per day
1	2018	9	5	4	4013	2	Paving Equipment	23	2	1	95.03889567	g/vehicle per day
1	2018	9	5	4	4013	2	Paving Equipment	23	3	1	185.3614646	g/vehicle per day
1	2018	9	5	4	4013	2	Paving Equipment	23	79	1	15.88343276	g/vehicle per day
1	2018	9	5	4	4013	2	Paving Equipment	23	87	1	19.55438724	g/vehicle per day
1	2018	9	5	4	4013	2	Paving Equipment	23	100	1	14.90969337	g/vehicle per day
1	2018	10	5	4	4013	2	Paving Equipment	23	1	1	16.8077478	g/vehicle per day
1	2018	10	5	4	4013	2	Paving Equipment	23	2	1	91.97310657	g/vehicle per day
1	2018	10	5	4	4013	2	Paving Equipment	23	3	1	179.3820945	g/vehicle per day
1	2018	10	5	4	4013	2	Paving Equipment	23	79	1	15.37106954	g/vehicle per day
1	2018	10	5	4	4013	2	Paving Equipment	23	87	1	18.92360154	g/vehicle per day
1	2018	10	5	4	4013	2	Paving Equipment	23	100	1	14.42873438	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	11	5	4	4013	2	Paving Equipment	23	1	1	17.36800508	g/vehicle per day
1	2018	11	5	4	4013	2	Paving Equipment	23	2	1	95.03889567	g/vehicle per day
1	2018	11	5	4	4013	2	Paving Equipment	23	3	1	185.3614646	g/vehicle per day
1	2018	11	5	4	4013	2	Paving Equipment	23	79	1	15.88343276	g/vehicle per day
1	2018	11	5	4	4013	2	Paving Equipment	23	87	1	19.55438724	g/vehicle per day
1	2018	11	5	4	4013	2	Paving Equipment	23	100	1	14.90969337	g/vehicle per day
1	2018	12	5	4	4013	2	Paving Equipment	23	1	1	15.00691685	g/vehicle per day
1	2018	12	5	4	4013	2	Paving Equipment	23	2	1	82.11886556	g/vehicle per day
1	2018	12	5	4	4013	2	Paving Equipment	23	3	1	160.1625344	g/vehicle per day
1	2018	12	5	4	4013	2	Paving Equipment	23	79	1	13.72416239	g/vehicle per day
1	2018	12	5	4	4013	2	Paving Equipment	23	87	1	16.89607277	g/vehicle per day
1	2018	12	5	4	4013	2	Paving Equipment	23	100	1	12.88280187	g/vehicle per day
2	2018	1	5	4	4013	2	Paving Equipment	23	1	1	15.00691685	g/vehicle per day
2	2018	1	5	4	4013	2	Paving Equipment	23	2	1	82.11886556	g/vehicle per day
2	2018	1	5	4	4013	2	Paving Equipment	23	3	1	160.1625344	g/vehicle per day
2	2018	1	5	4	4013	2	Paving Equipment	23	79	1	13.72416239	g/vehicle per day
2	2018	1	5	4	4013	2	Paving Equipment	23	87	1	16.89607277	g/vehicle per day
2	2018	1	5	4	4013	2	Paving Equipment	23	100	1	12.88280187	g/vehicle per day
2	2018	2	5	4	4013	2	Paving Equipment	23	1	1	16.61480831	g/vehicle per day
2	2018	2	5	4	4013	2	Paving Equipment	23	2	1	90.91731184	g/vehicle per day
2	2018	2	5	4	4013	2	Paving Equipment	23	3	1	177.322874	g/vehicle per day
2	2018	2	5	4	4013	2	Paving Equipment	23	79	1	15.19462002	g/vehicle per day
2	2018	2	5	4	4013	2	Paving Equipment	23	87	1	18.70637958	g/vehicle per day
2	2018	2	5	4	4013	2	Paving Equipment	23	100	1	14.26310093	g/vehicle per day
2	2018	3	5	4	4013	2	Paving Equipment	23	1	1	16.8077478	g/vehicle per day
2	2018	3	5	4	4013	2	Paving Equipment	23	2	1	91.97310657	g/vehicle per day
2	2018	3	5	4	4013	2	Paving Equipment	23	3	1	179.3820945	g/vehicle per day
2	2018	3	5	4	4013	2	Paving Equipment	23	79	1	15.37106954	g/vehicle per day
2	2018	3	5	4	4013	2	Paving Equipment	23	87	1	18.92360154	g/vehicle per day
2	2018	3	5	4	4013	2	Paving Equipment	23	100	1	14.42873438	g/vehicle per day
2	2018	4	5	4	4013	2	Paving Equipment	23	1	1	17.36800508	g/vehicle per day
2	2018	4	5	4	4013	2	Paving Equipment	23	2	1	95.03889567	g/vehicle per day
2	2018	4	5	4	4013	2	Paving Equipment	23	3	1	185.3614646	g/vehicle per day
2	2018	4	5	4	4013	2	Paving Equipment	23	79	1	15.88343276	g/vehicle per day
2	2018	4	5	4	4013	2	Paving Equipment	23	87	1	19.55438724	g/vehicle per day
2	2018	4	5	4	4013	2	Paving Equipment	23	100	1	14.90969337	g/vehicle per day
2	2018	5	5	4	4013	2	Paving Equipment	23	1	1	16.8077478	g/vehicle per day
2	2018	5	5	4	4013	2	Paving Equipment	23	2	1	91.97310657	g/vehicle per day
2	2018	5	5	4	4013	2	Paving Equipment	23	3	1	179.3820945	g/vehicle per day
2	2018	5	5	4	4013	2	Paving Equipment	23	79	1	15.37106954	g/vehicle per day
2	2018	5	5	4	4013	2	Paving Equipment	23	87	1	18.92360154	g/vehicle per day
2	2018	5	5	4	4013	2	Paving Equipment	23	100	1	14.42873438	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	6	5	4	4013	2	Paving Equipment	23	1	1	18.81534222	g/vehicle per day
2	2018	6	5	4	4013	2	Paving Equipment	23	2	1	102.9587805	g/vehicle per day
2	2018	6	5	4	4013	2	Paving Equipment	23	3	1	200.808267	g/vehicle per day
2	2018	6	5	4	4013	2	Paving Equipment	23	79	1	17.20705517	g/vehicle per day
2	2018	6	5	4	4013	2	Paving Equipment	23	87	1	21.1839244	g/vehicle per day
2	2018	6	5	4	4013	2	Paving Equipment	23	100	1	16.15216968	g/vehicle per day
2	2018	7	5	4	4013	2	Paving Equipment	23	1	1	18.20838908	g/vehicle per day
2	2018	7	5	4	4013	2	Paving Equipment	23	2	1	99.63753649	g/vehicle per day
2	2018	7	5	4	4013	2	Paving Equipment	23	3	1	194.3305745	g/vehicle per day
2	2018	7	5	4	4013	2	Paving Equipment	23	79	1	16.65198381	g/vehicle per day
2	2018	7	5	4	4013	2	Paving Equipment	23	87	1	20.5005658	g/vehicle per day
2	2018	7	5	4	4013	2	Paving Equipment	23	100	1	15.6311279	g/vehicle per day
2	2018	8	5	4	4013	2	Paving Equipment	23	1	1	18.20838908	g/vehicle per day
2	2018	8	5	4	4013	2	Paving Equipment	23	2	1	99.63753649	g/vehicle per day
2	2018	8	5	4	4013	2	Paving Equipment	23	3	1	194.3305745	g/vehicle per day
2	2018	8	5	4	4013	2	Paving Equipment	23	79	1	16.65198381	g/vehicle per day
2	2018	8	5	4	4013	2	Paving Equipment	23	87	1	20.5005658	g/vehicle per day
2	2018	8	5	4	4013	2	Paving Equipment	23	100	1	15.6311279	g/vehicle per day
2	2018	9	5	4	4013	2	Paving Equipment	23	1	1	17.36800508	g/vehicle per day
2	2018	9	5	4	4013	2	Paving Equipment	23	2	1	95.03889567	g/vehicle per day
2	2018	9	5	4	4013	2	Paving Equipment	23	3	1	185.3614646	g/vehicle per day
2	2018	9	5	4	4013	2	Paving Equipment	23	79	1	15.88343276	g/vehicle per day
2	2018	9	5	4	4013	2	Paving Equipment	23	87	1	19.55438724	g/vehicle per day
2	2018	9	5	4	4013	2	Paving Equipment	23	100	1	14.90969337	g/vehicle per day
2	2018	10	5	4	4013	2	Paving Equipment	23	1	1	16.8077478	g/vehicle per day
2	2018	10	5	4	4013	2	Paving Equipment	23	2	1	91.97310657	g/vehicle per day
2	2018	10	5	4	4013	2	Paving Equipment	23	3	1	179.3820945	g/vehicle per day
2	2018	10	5	4	4013	2	Paving Equipment	23	79	1	15.37106954	g/vehicle per day
2	2018	10	5	4	4013	2	Paving Equipment	23	87	1	18.92360154	g/vehicle per day
2	2018	10	5	4	4013	2	Paving Equipment	23	100	1	14.42873438	g/vehicle per day
2	2018	11	5	4	4013	2	Paving Equipment	23	1	1	17.36800508	g/vehicle per day
2	2018	11	5	4	4013	2	Paving Equipment	23	2	1	95.03889567	g/vehicle per day
2	2018	11	5	4	4013	2	Paving Equipment	23	3	1	185.3614646	g/vehicle per day
2	2018	11	5	4	4013	2	Paving Equipment	23	79	1	15.88343276	g/vehicle per day
2	2018	11	5	4	4013	2	Paving Equipment	23	87	1	19.55438724	g/vehicle per day
2	2018	11	5	4	4013	2	Paving Equipment	23	100	1	14.90969337	g/vehicle per day
2	2018	12	5	4	4013	2	Paving Equipment	23	1	1	15.00691685	g/vehicle per day
2	2018	12	5	4	4013	2	Paving Equipment	23	2	1	82.11886556	g/vehicle per day
2	2018	12	5	4	4013	2	Paving Equipment	23	3	1	160.1625344	g/vehicle per day
2	2018	12	5	4	4013	2	Paving Equipment	23	79	1	13.72416239	g/vehicle per day
2	2018	12	5	4	4013	2	Paving Equipment	23	87	1	16.89607277	g/vehicle per day
2	2018	12	5	4	4013	2	Paving Equipment	23	100	1	12.88280187	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	1	5	4	4013	2	Paving Equipment	23	1	1	14.07579662	g/vehicle per day
2	2019	1	5	4	4013	2	Paving Equipment	23	2	1	73.37150113	g/vehicle per day
2	2019	1	5	4	4013	2	Paving Equipment	23	3	1	144.2181598	g/vehicle per day
2	2019	1	5	4	4013	2	Paving Equipment	23	79	1	12.83996172	g/vehicle per day
2	2019	1	5	4	4013	2	Paving Equipment	23	87	1	15.9125095	g/vehicle per day
2	2019	1	5	4	4013	2	Paving Equipment	23	100	1	11.41693764	g/vehicle per day
2	2019	2	5	4	4013	2	Paving Equipment	23	1	1	15.5839227	g/vehicle per day
2	2019	2	5	4	4013	2	Paving Equipment	23	2	1	81.23273549	g/vehicle per day
2	2019	2	5	4	4013	2	Paving Equipment	23	3	1	159.6701697	g/vehicle per day
2	2019	2	5	4	4013	2	Paving Equipment	23	79	1	14.2156754	g/vehicle per day
2	2019	2	5	4	4013	2	Paving Equipment	23	87	1	17.61743342	g/vehicle per day
2	2019	2	5	4	4013	2	Paving Equipment	23	100	1	12.64018753	g/vehicle per day
2	2019	3	5	4	4013	2	Paving Equipment	23	1	1	15.76489527	g/vehicle per day
2	2019	3	5	4	4013	2	Paving Equipment	23	2	1	82.17604596	g/vehicle per day
2	2019	3	5	4	4013	2	Paving Equipment	23	3	1	161.5243044	g/vehicle per day
2	2019	3	5	4	4013	2	Paving Equipment	23	79	1	14.38075591	g/vehicle per day
2	2019	3	5	4	4013	2	Paving Equipment	23	87	1	17.82200953	g/vehicle per day
2	2019	3	5	4	4013	2	Paving Equipment	23	100	1	12.78696889	g/vehicle per day
2	2019	4	5	4	4013	2	Paving Equipment	23	1	1	16.29038992	g/vehicle per day
2	2019	4	5	4	4013	2	Paving Equipment	23	2	1	84.91526114	g/vehicle per day
2	2019	4	5	4	4013	2	Paving Equipment	23	3	1	166.908506	g/vehicle per day
2	2019	4	5	4	4013	2	Paving Equipment	23	79	1	14.86011378	g/vehicle per day
2	2019	4	5	4	4013	2	Paving Equipment	23	87	1	18.41607951	g/vehicle per day
2	2019	4	5	4	4013	2	Paving Equipment	23	100	1	13.21320446	g/vehicle per day
2	2019	5	5	4	4013	2	Paving Equipment	23	1	1	15.76489527	g/vehicle per day
2	2019	5	5	4	4013	2	Paving Equipment	23	2	1	82.17604596	g/vehicle per day
2	2019	5	5	4	4013	2	Paving Equipment	23	3	1	161.5243044	g/vehicle per day
2	2019	5	5	4	4013	2	Paving Equipment	23	79	1	14.38075591	g/vehicle per day
2	2019	5	5	4	4013	2	Paving Equipment	23	87	1	17.82200953	g/vehicle per day
2	2019	5	5	4	4013	2	Paving Equipment	23	100	1	12.78696889	g/vehicle per day
2	2019	6	5	4	4013	2	Paving Equipment	23	1	1	17.64791945	g/vehicle per day
2	2019	6	5	4	4013	2	Paving Equipment	23	2	1	91.99154799	g/vehicle per day
2	2019	6	5	4	4013	2	Paving Equipment	23	3	1	180.8175318	g/vehicle per day
2	2019	6	5	4	4013	2	Paving Equipment	23	79	1	16.09845469	g/vehicle per day
2	2019	6	5	4	4013	2	Paving Equipment	23	87	1	19.95074617	g/vehicle per day
2	2019	6	5	4	4013	2	Paving Equipment	23	100	1	14.31430358	g/vehicle per day
2	2019	7	5	4	4013	2	Paving Equipment	23	1	1	17.07863197	g/vehicle per day
2	2019	7	5	4	4013	2	Paving Equipment	23	2	1	89.02407044	g/vehicle per day
2	2019	7	5	4	4013	2	Paving Equipment	23	3	1	174.9846225	g/vehicle per day
2	2019	7	5	4	4013	2	Paving Equipment	23	79	1	15.57915051	g/vehicle per day
2	2019	7	5	4	4013	2	Paving Equipment	23	87	1	19.30718296	g/vehicle per day
2	2019	7	5	4	4013	2	Paving Equipment	23	100	1	13.85255053	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	8	5	4	4013	2	Paving Equipment	23	1	1	17.07863197	g/vehicle per day
2	2019	8	5	4	4013	2	Paving Equipment	23	2	1	89.02407044	g/vehicle per day
2	2019	8	5	4	4013	2	Paving Equipment	23	3	1	174.9846225	g/vehicle per day
2	2019	8	5	4	4013	2	Paving Equipment	23	79	1	15.57915051	g/vehicle per day
2	2019	8	5	4	4013	2	Paving Equipment	23	87	1	19.30718296	g/vehicle per day
2	2019	8	5	4	4013	2	Paving Equipment	23	100	1	13.85255053	g/vehicle per day
2	2019	9	5	4	4013	2	Paving Equipment	23	1	1	16.29038992	g/vehicle per day
2	2019	9	5	4	4013	2	Paving Equipment	23	2	1	84.91526114	g/vehicle per day
2	2019	9	5	4	4013	2	Paving Equipment	23	3	1	166.908506	g/vehicle per day
2	2019	9	5	4	4013	2	Paving Equipment	23	79	1	14.86011378	g/vehicle per day
2	2019	9	5	4	4013	2	Paving Equipment	23	87	1	18.41607951	g/vehicle per day
2	2019	9	5	4	4013	2	Paving Equipment	23	100	1	13.21320446	g/vehicle per day
2	2019	10	5	4	4013	2	Paving Equipment	23	1	1	15.76489527	g/vehicle per day
2	2019	10	5	4	4013	2	Paving Equipment	23	2	1	82.17604596	g/vehicle per day
2	2019	10	5	4	4013	2	Paving Equipment	23	3	1	161.5243044	g/vehicle per day
2	2019	10	5	4	4013	2	Paving Equipment	23	79	1	14.38075591	g/vehicle per day
2	2019	10	5	4	4013	2	Paving Equipment	23	87	1	17.82200953	g/vehicle per day
2	2019	10	5	4	4013	2	Paving Equipment	23	100	1	12.78696889	g/vehicle per day
2	2019	11	5	4	4013	2	Paving Equipment	23	1	1	16.29038992	g/vehicle per day
2	2019	11	5	4	4013	2	Paving Equipment	23	2	1	84.91526114	g/vehicle per day
2	2019	11	5	4	4013	2	Paving Equipment	23	3	1	166.908506	g/vehicle per day
2	2019	11	5	4	4013	2	Paving Equipment	23	79	1	14.86011378	g/vehicle per day
2	2019	11	5	4	4013	2	Paving Equipment	23	87	1	18.41607951	g/vehicle per day
2	2019	11	5	4	4013	2	Paving Equipment	23	100	1	13.21320446	g/vehicle per day
2	2019	12	5	4	4013	2	Paving Equipment	23	1	1	14.07579662	g/vehicle per day
2	2019	12	5	4	4013	2	Paving Equipment	23	2	1	73.37150113	g/vehicle per day
2	2019	12	5	4	4013	2	Paving Equipment	23	3	1	144.2181598	g/vehicle per day
2	2019	12	5	4	4013	2	Paving Equipment	23	79	1	12.83996172	g/vehicle per day
2	2019	12	5	4	4013	2	Paving Equipment	23	87	1	15.9125095	g/vehicle per day
2	2019	12	5	4	4013	2	Paving Equipment	23	100	1	11.41693764	g/vehicle per day
2	2017	1	5	4	4013	2	Plate Compactors	23	1	1	2.506483459	g/vehicle per day
2	2017	1	5	4	4013	2	Plate Compactors	23	2	1	16.71063157	g/vehicle per day
2	2017	1	5	4	4013	2	Plate Compactors	23	3	1	20.25539883	g/vehicle per day
2	2017	1	5	4	4013	2	Plate Compactors	23	79	1	2.296569697	g/vehicle per day
2	2017	1	5	4	4013	2	Plate Compactors	23	87	1	2.769569609	g/vehicle per day
2	2017	1	5	4	4013	2	Plate Compactors	23	100	1	1.775674662	g/vehicle per day
2	2017	2	5	4	4013	2	Plate Compactors	23	1	1	2.775035492	g/vehicle per day
2	2017	2	5	4	4013	2	Plate Compactors	23	2	1	18.50105584	g/vehicle per day
2	2017	2	5	4	4013	2	Plate Compactors	23	3	1	22.42562774	g/vehicle per day
2	2017	2	5	4	4013	2	Plate Compactors	23	79	1	2.542630917	g/vehicle per day
2	2017	2	5	4	4013	2	Plate Compactors	23	87	1	3.066309177	g/vehicle per day
2	2017	2	5	4	4013	2	Plate Compactors	23	100	1	1.965926336	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	3	5	4	4013	2	Plate Compactors	23	1	1	2.807261375	g/vehicle per day
2	2017	3	5	4	4013	2	Plate Compactors	23	2	1	18.71589792	g/vehicle per day
2	2017	3	5	4	4013	2	Plate Compactors	23	3	1	22.68604021	g/vehicle per day
2	2017	3	5	4	4013	2	Plate Compactors	23	79	1	2.572158235	g/vehicle per day
2	2017	3	5	4	4013	2	Plate Compactors	23	87	1	3.101917945	g/vehicle per day
2	2017	3	5	4	4013	2	Plate Compactors	23	100	1	1.988755332	g/vehicle per day
2	2017	4	5	4	4013	2	Plate Compactors	23	1	1	2.900836196	g/vehicle per day
2	2017	4	5	4	4013	2	Plate Compactors	23	2	1	19.33977332	g/vehicle per day
2	2017	4	5	4	4013	2	Plate Compactors	23	3	1	23.44224367	g/vehicle per day
2	2017	4	5	4	4013	2	Plate Compactors	23	79	1	2.657896495	g/vehicle per day
2	2017	4	5	4	4013	2	Plate Compactors	23	87	1	3.205314581	g/vehicle per day
2	2017	4	5	4	4013	2	Plate Compactors	23	100	1	2.055047275	g/vehicle per day
2	2017	5	5	4	4013	2	Plate Compactors	23	1	1	2.807261375	g/vehicle per day
2	2017	5	5	4	4013	2	Plate Compactors	23	2	1	18.71589792	g/vehicle per day
2	2017	5	5	4	4013	2	Plate Compactors	23	3	1	22.68604021	g/vehicle per day
2	2017	5	5	4	4013	2	Plate Compactors	23	79	1	2.572158235	g/vehicle per day
2	2017	5	5	4	4013	2	Plate Compactors	23	87	1	3.101917945	g/vehicle per day
2	2017	5	5	4	4013	2	Plate Compactors	23	100	1	1.988755332	g/vehicle per day
2	2017	6	5	4	4013	2	Plate Compactors	23	1	1	3.142573717	g/vehicle per day
2	2017	6	5	4	4013	2	Plate Compactors	23	2	1	20.95141452	g/vehicle per day
2	2017	6	5	4	4013	2	Plate Compactors	23	3	1	25.39576814	g/vehicle per day
2	2017	6	5	4	4013	2	Plate Compactors	23	79	1	2.879388748	g/vehicle per day
2	2017	6	5	4	4013	2	Plate Compactors	23	87	1	3.472425005	g/vehicle per day
2	2017	6	5	4	4013	2	Plate Compactors	23	100	1	2.226301809	g/vehicle per day
2	2017	7	5	4	4013	2	Plate Compactors	23	1	1	3.041200161	g/vehicle per day
2	2017	7	5	4	4013	2	Plate Compactors	23	2	1	20.27555385	g/vehicle per day
2	2017	7	5	4	4013	2	Plate Compactors	23	3	1	24.57654143	g/vehicle per day
2	2017	7	5	4	4013	2	Plate Compactors	23	79	1	2.786504981	g/vehicle per day
2	2017	7	5	4	4013	2	Plate Compactors	23	87	1	3.360411753	g/vehicle per day
2	2017	7	5	4	4013	2	Plate Compactors	23	100	1	2.154485531	g/vehicle per day
2	2017	8	5	4	4013	2	Plate Compactors	23	1	1	3.041200161	g/vehicle per day
2	2017	8	5	4	4013	2	Plate Compactors	23	2	1	20.27555385	g/vehicle per day
2	2017	8	5	4	4013	2	Plate Compactors	23	3	1	24.57654143	g/vehicle per day
2	2017	8	5	4	4013	2	Plate Compactors	23	79	1	2.786504981	g/vehicle per day
2	2017	8	5	4	4013	2	Plate Compactors	23	87	1	3.360411753	g/vehicle per day
2	2017	8	5	4	4013	2	Plate Compactors	23	100	1	2.154485531	g/vehicle per day
2	2017	9	5	4	4013	2	Plate Compactors	23	1	1	2.900836196	g/vehicle per day
2	2017	9	5	4	4013	2	Plate Compactors	23	2	1	19.33977332	g/vehicle per day
2	2017	9	5	4	4013	2	Plate Compactors	23	3	1	23.44224367	g/vehicle per day
2	2017	9	5	4	4013	2	Plate Compactors	23	79	1	2.657896495	g/vehicle per day
2	2017	9	5	4	4013	2	Plate Compactors	23	87	1	3.205314581	g/vehicle per day
2	2017	9	5	4	4013	2	Plate Compactors	23	100	1	2.055047275	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	10	5	4	4013	2	Plate Compactors	23	1	1	2.807261375	g/vehicle per day
2	2017	10	5	4	4013	2	Plate Compactors	23	2	1	18.71589792	g/vehicle per day
2	2017	10	5	4	4013	2	Plate Compactors	23	3	1	22.68604021	g/vehicle per day
2	2017	10	5	4	4013	2	Plate Compactors	23	79	1	2.572158235	g/vehicle per day
2	2017	10	5	4	4013	2	Plate Compactors	23	87	1	3.101917945	g/vehicle per day
2	2017	10	5	4	4013	2	Plate Compactors	23	100	1	1.988755332	g/vehicle per day
2	2017	11	5	4	4013	2	Plate Compactors	23	1	1	2.900836196	g/vehicle per day
2	2017	11	5	4	4013	2	Plate Compactors	23	2	1	19.33977332	g/vehicle per day
2	2017	11	5	4	4013	2	Plate Compactors	23	3	1	23.44224367	g/vehicle per day
2	2017	11	5	4	4013	2	Plate Compactors	23	79	1	2.657896495	g/vehicle per day
2	2017	11	5	4	4013	2	Plate Compactors	23	87	1	3.205314581	g/vehicle per day
2	2017	11	5	4	4013	2	Plate Compactors	23	100	1	2.055047275	g/vehicle per day
2	2017	12	5	4	4013	2	Plate Compactors	23	1	1	2.506483459	g/vehicle per day
2	2017	12	5	4	4013	2	Plate Compactors	23	2	1	16.71063157	g/vehicle per day
2	2017	12	5	4	4013	2	Plate Compactors	23	3	1	20.25539883	g/vehicle per day
2	2017	12	5	4	4013	2	Plate Compactors	23	79	1	2.296569697	g/vehicle per day
2	2017	12	5	4	4013	2	Plate Compactors	23	87	1	2.769569609	g/vehicle per day
2	2017	12	5	4	4013	2	Plate Compactors	23	100	1	1.775674662	g/vehicle per day
1	2018	1	5	4	4013	2	Plate Compactors	23	1	1	2.449258683	g/vehicle per day
1	2018	1	5	4	4013	2	Plate Compactors	23	2	1	16.65839038	g/vehicle per day
1	2018	1	5	4	4013	2	Plate Compactors	23	3	1	19.98292562	g/vehicle per day
1	2018	1	5	4	4013	2	Plate Compactors	23	79	1	2.235607349	g/vehicle per day
1	2018	1	5	4	4013	2	Plate Compactors	23	87	1	2.710858103	g/vehicle per day
1	2018	1	5	4	4013	2	Plate Compactors	23	100	1	1.708958032	g/vehicle per day
1	2018	2	5	4	4013	2	Plate Compactors	23	1	1	2.711679262	g/vehicle per day
1	2018	2	5	4	4013	2	Plate Compactors	23	2	1	18.44321771	g/vehicle per day
1	2018	2	5	4	4013	2	Plate Compactors	23	3	1	22.1239584	g/vehicle per day
1	2018	2	5	4	4013	2	Plate Compactors	23	79	1	2.475137088	g/vehicle per day
1	2018	2	5	4	4013	2	Plate Compactors	23	87	1	3.001306987	g/vehicle per day
1	2018	2	5	4	4013	2	Plate Compactors	23	100	1	1.892061035	g/vehicle per day
1	2018	3	5	4	4013	2	Plate Compactors	23	1	1	2.743168926	g/vehicle per day
1	2018	3	5	4	4013	2	Plate Compactors	23	2	1	18.65738956	g/vehicle per day
1	2018	3	5	4	4013	2	Plate Compactors	23	3	1	22.38087297	g/vehicle per day
1	2018	3	5	4	4013	2	Plate Compactors	23	79	1	2.503879772	g/vehicle per day
1	2018	3	5	4	4013	2	Plate Compactors	23	87	1	3.036160169	g/vehicle per day
1	2018	3	5	4	4013	2	Plate Compactors	23	100	1	1.914033152	g/vehicle per day
1	2018	4	5	4	4013	2	Plate Compactors	23	1	1	2.834608254	g/vehicle per day
1	2018	4	5	4	4013	2	Plate Compactors	23	2	1	19.27930256	g/vehicle per day
1	2018	4	5	4	4013	2	Plate Compactors	23	3	1	23.12690451	g/vehicle per day
1	2018	4	5	4	4013	2	Plate Compactors	23	79	1	2.587343309	g/vehicle per day
1	2018	4	5	4	4013	2	Plate Compactors	23	87	1	3.137366529	g/vehicle per day
1	2018	4	5	4	4013	2	Plate Compactors	23	100	1	1.977834267	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	5	5	4	4013	2	Plate Compactors	23	1	1	2.743168926	g/vehicle per day
1	2018	5	5	4	4013	2	Plate Compactors	23	2	1	18.65738956	g/vehicle per day
1	2018	5	5	4	4013	2	Plate Compactors	23	3	1	22.38087297	g/vehicle per day
1	2018	5	5	4	4013	2	Plate Compactors	23	79	1	2.503879772	g/vehicle per day
1	2018	5	5	4	4013	2	Plate Compactors	23	87	1	3.036160169	g/vehicle per day
1	2018	5	5	4	4013	2	Plate Compactors	23	100	1	1.914033152	g/vehicle per day
1	2018	6	5	4	4013	2	Plate Compactors	23	1	1	3.070825498	g/vehicle per day
1	2018	6	5	4	4013	2	Plate Compactors	23	2	1	20.88591418	g/vehicle per day
1	2018	6	5	4	4013	2	Plate Compactors	23	3	1	25.05414375	g/vehicle per day
1	2018	6	5	4	4013	2	Plate Compactors	23	79	1	2.80295427	g/vehicle per day
1	2018	6	5	4	4013	2	Plate Compactors	23	87	1	3.398814038	g/vehicle per day
1	2018	6	5	4	4013	2	Plate Compactors	23	100	1	2.142653699	g/vehicle per day
1	2018	7	5	4	4013	2	Plate Compactors	23	1	1	2.971766074	g/vehicle per day
1	2018	7	5	4	4013	2	Plate Compactors	23	2	1	20.21217448	g/vehicle per day
1	2018	7	5	4	4013	2	Plate Compactors	23	3	1	24.24594662	g/vehicle per day
1	2018	7	5	4	4013	2	Plate Compactors	23	79	1	2.712536393	g/vehicle per day
1	2018	7	5	4	4013	2	Plate Compactors	23	87	1	3.289173255	g/vehicle per day
1	2018	7	5	4	4013	2	Plate Compactors	23	100	1	2.07353563	g/vehicle per day
1	2018	8	5	4	4013	2	Plate Compactors	23	1	1	2.971766074	g/vehicle per day
1	2018	8	5	4	4013	2	Plate Compactors	23	2	1	20.21217448	g/vehicle per day
1	2018	8	5	4	4013	2	Plate Compactors	23	3	1	24.24594662	g/vehicle per day
1	2018	8	5	4	4013	2	Plate Compactors	23	79	1	2.712536393	g/vehicle per day
1	2018	8	5	4	4013	2	Plate Compactors	23	87	1	3.289173255	g/vehicle per day
1	2018	8	5	4	4013	2	Plate Compactors	23	100	1	2.07353563	g/vehicle per day
1	2018	9	5	4	4013	2	Plate Compactors	23	1	1	2.834608254	g/vehicle per day
1	2018	9	5	4	4013	2	Plate Compactors	23	2	1	19.27930256	g/vehicle per day
1	2018	9	5	4	4013	2	Plate Compactors	23	3	1	23.12690451	g/vehicle per day
1	2018	9	5	4	4013	2	Plate Compactors	23	79	1	2.587343309	g/vehicle per day
1	2018	9	5	4	4013	2	Plate Compactors	23	87	1	3.137366529	g/vehicle per day
1	2018	9	5	4	4013	2	Plate Compactors	23	100	1	1.977834267	g/vehicle per day
1	2018	10	5	4	4013	2	Plate Compactors	23	1	1	2.743168926	g/vehicle per day
1	2018	10	5	4	4013	2	Plate Compactors	23	2	1	18.65738956	g/vehicle per day
1	2018	10	5	4	4013	2	Plate Compactors	23	3	1	22.38087297	g/vehicle per day
1	2018	10	5	4	4013	2	Plate Compactors	23	79	1	2.503879772	g/vehicle per day
1	2018	10	5	4	4013	2	Plate Compactors	23	87	1	3.036160169	g/vehicle per day
1	2018	10	5	4	4013	2	Plate Compactors	23	100	1	1.914033152	g/vehicle per day
1	2018	11	5	4	4013	2	Plate Compactors	23	1	1	2.834608254	g/vehicle per day
1	2018	11	5	4	4013	2	Plate Compactors	23	2	1	19.27930256	g/vehicle per day
1	2018	11	5	4	4013	2	Plate Compactors	23	3	1	23.12690451	g/vehicle per day
1	2018	11	5	4	4013	2	Plate Compactors	23	79	1	2.587343309	g/vehicle per day
1	2018	11	5	4	4013	2	Plate Compactors	23	87	1	3.137366529	g/vehicle per day
1	2018	11	5	4	4013	2	Plate Compactors	23	100	1	1.977834267	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	12	5	4	4013	2	Plate Compactors	23	1	1	2.449258683	g/vehicle per day
1	2018	12	5	4	4013	2	Plate Compactors	23	2	1	16.65839038	g/vehicle per day
1	2018	12	5	4	4013	2	Plate Compactors	23	3	1	19.98292562	g/vehicle per day
1	2018	12	5	4	4013	2	Plate Compactors	23	79	1	2.235607349	g/vehicle per day
1	2018	12	5	4	4013	2	Plate Compactors	23	87	1	2.710858103	g/vehicle per day
1	2018	12	5	4	4013	2	Plate Compactors	23	100	1	1.708958032	g/vehicle per day
2	2018	1	5	4	4013	2	Plate Compactors	23	1	1	2.449258683	g/vehicle per day
2	2018	1	5	4	4013	2	Plate Compactors	23	2	1	16.65839038	g/vehicle per day
2	2018	1	5	4	4013	2	Plate Compactors	23	3	1	19.98292562	g/vehicle per day
2	2018	1	5	4	4013	2	Plate Compactors	23	79	1	2.235607349	g/vehicle per day
2	2018	1	5	4	4013	2	Plate Compactors	23	87	1	2.710858103	g/vehicle per day
2	2018	1	5	4	4013	2	Plate Compactors	23	100	1	1.708958032	g/vehicle per day
2	2018	2	5	4	4013	2	Plate Compactors	23	1	1	2.711679262	g/vehicle per day
2	2018	2	5	4	4013	2	Plate Compactors	23	2	1	18.44321771	g/vehicle per day
2	2018	2	5	4	4013	2	Plate Compactors	23	3	1	22.1239584	g/vehicle per day
2	2018	2	5	4	4013	2	Plate Compactors	23	79	1	2.475137088	g/vehicle per day
2	2018	2	5	4	4013	2	Plate Compactors	23	87	1	3.001306987	g/vehicle per day
2	2018	2	5	4	4013	2	Plate Compactors	23	100	1	1.892061035	g/vehicle per day
2	2018	3	5	4	4013	2	Plate Compactors	23	1	1	2.743168926	g/vehicle per day
2	2018	3	5	4	4013	2	Plate Compactors	23	2	1	18.65738956	g/vehicle per day
2	2018	3	5	4	4013	2	Plate Compactors	23	3	1	22.38087297	g/vehicle per day
2	2018	3	5	4	4013	2	Plate Compactors	23	79	1	2.503879772	g/vehicle per day
2	2018	3	5	4	4013	2	Plate Compactors	23	87	1	3.036160169	g/vehicle per day
2	2018	3	5	4	4013	2	Plate Compactors	23	100	1	1.914033152	g/vehicle per day
2	2018	4	5	4	4013	2	Plate Compactors	23	1	1	2.834608254	g/vehicle per day
2	2018	4	5	4	4013	2	Plate Compactors	23	2	1	19.27930256	g/vehicle per day
2	2018	4	5	4	4013	2	Plate Compactors	23	3	1	23.12690451	g/vehicle per day
2	2018	4	5	4	4013	2	Plate Compactors	23	79	1	2.587343309	g/vehicle per day
2	2018	4	5	4	4013	2	Plate Compactors	23	87	1	3.137366529	g/vehicle per day
2	2018	4	5	4	4013	2	Plate Compactors	23	100	1	1.977834267	g/vehicle per day
2	2018	5	5	4	4013	2	Plate Compactors	23	1	1	2.743168926	g/vehicle per day
2	2018	5	5	4	4013	2	Plate Compactors	23	2	1	18.65738956	g/vehicle per day
2	2018	5	5	4	4013	2	Plate Compactors	23	3	1	22.38087297	g/vehicle per day
2	2018	5	5	4	4013	2	Plate Compactors	23	79	1	2.503879772	g/vehicle per day
2	2018	5	5	4	4013	2	Plate Compactors	23	87	1	3.036160169	g/vehicle per day
2	2018	5	5	4	4013	2	Plate Compactors	23	100	1	1.914033152	g/vehicle per day
2	2018	6	5	4	4013	2	Plate Compactors	23	1	1	3.070825498	g/vehicle per day
2	2018	6	5	4	4013	2	Plate Compactors	23	2	1	20.88591418	g/vehicle per day
2	2018	6	5	4	4013	2	Plate Compactors	23	3	1	25.05414375	g/vehicle per day
2	2018	6	5	4	4013	2	Plate Compactors	23	79	1	2.80295427	g/vehicle per day
2	2018	6	5	4	4013	2	Plate Compactors	23	87	1	3.398814038	g/vehicle per day
2	2018	6	5	4	4013	2	Plate Compactors	23	100	1	2.142653699	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	7	5	4	4013	2	Plate Compactors	23	1	1	2.971766074	g/vehicle per day
2	2018	7	5	4	4013	2	Plate Compactors	23	2	1	20.21217448	g/vehicle per day
2	2018	7	5	4	4013	2	Plate Compactors	23	3	1	24.24594662	g/vehicle per day
2	2018	7	5	4	4013	2	Plate Compactors	23	79	1	2.712536393	g/vehicle per day
2	2018	7	5	4	4013	2	Plate Compactors	23	87	1	3.289173255	g/vehicle per day
2	2018	7	5	4	4013	2	Plate Compactors	23	100	1	2.07353563	g/vehicle per day
2	2018	8	5	4	4013	2	Plate Compactors	23	1	1	2.971766074	g/vehicle per day
2	2018	8	5	4	4013	2	Plate Compactors	23	2	1	20.21217448	g/vehicle per day
2	2018	8	5	4	4013	2	Plate Compactors	23	3	1	24.24594662	g/vehicle per day
2	2018	8	5	4	4013	2	Plate Compactors	23	79	1	2.712536393	g/vehicle per day
2	2018	8	5	4	4013	2	Plate Compactors	23	87	1	3.289173255	g/vehicle per day
2	2018	8	5	4	4013	2	Plate Compactors	23	100	1	2.07353563	g/vehicle per day
2	2018	9	5	4	4013	2	Plate Compactors	23	1	1	2.834608254	g/vehicle per day
2	2018	9	5	4	4013	2	Plate Compactors	23	2	1	19.27930256	g/vehicle per day
2	2018	9	5	4	4013	2	Plate Compactors	23	3	1	23.12690451	g/vehicle per day
2	2018	9	5	4	4013	2	Plate Compactors	23	79	1	2.587343309	g/vehicle per day
2	2018	9	5	4	4013	2	Plate Compactors	23	87	1	3.137366529	g/vehicle per day
2	2018	9	5	4	4013	2	Plate Compactors	23	100	1	1.977834267	g/vehicle per day
2	2018	10	5	4	4013	2	Plate Compactors	23	1	1	2.743168926	g/vehicle per day
2	2018	10	5	4	4013	2	Plate Compactors	23	2	1	18.65738956	g/vehicle per day
2	2018	10	5	4	4013	2	Plate Compactors	23	3	1	22.38087297	g/vehicle per day
2	2018	10	5	4	4013	2	Plate Compactors	23	79	1	2.503879772	g/vehicle per day
2	2018	10	5	4	4013	2	Plate Compactors	23	87	1	3.036160169	g/vehicle per day
2	2018	10	5	4	4013	2	Plate Compactors	23	100	1	1.914033152	g/vehicle per day
2	2018	11	5	4	4013	2	Plate Compactors	23	1	1	2.834608254	g/vehicle per day
2	2018	11	5	4	4013	2	Plate Compactors	23	2	1	19.27930256	g/vehicle per day
2	2018	11	5	4	4013	2	Plate Compactors	23	3	1	23.12690451	g/vehicle per day
2	2018	11	5	4	4013	2	Plate Compactors	23	79	1	2.587343309	g/vehicle per day
2	2018	11	5	4	4013	2	Plate Compactors	23	87	1	3.137366529	g/vehicle per day
2	2018	11	5	4	4013	2	Plate Compactors	23	100	1	1.977834267	g/vehicle per day
2	2018	12	5	4	4013	2	Plate Compactors	23	1	1	2.449258683	g/vehicle per day
2	2018	12	5	4	4013	2	Plate Compactors	23	2	1	16.65839038	g/vehicle per day
2	2018	12	5	4	4013	2	Plate Compactors	23	3	1	19.98292562	g/vehicle per day
2	2018	12	5	4	4013	2	Plate Compactors	23	79	1	2.235607349	g/vehicle per day
2	2018	12	5	4	4013	2	Plate Compactors	23	87	1	2.710858103	g/vehicle per day
2	2018	12	5	4	4013	2	Plate Compactors	23	100	1	1.708958032	g/vehicle per day
2	2019	1	5	4	4013	2	Plate Compactors	23	1	1	2.409139229	g/vehicle per day
2	2019	1	5	4	4013	2	Plate Compactors	23	2	1	16.63533431	g/vehicle per day
2	2019	1	5	4	4013	2	Plate Compactors	23	3	1	19.79275352	g/vehicle per day
2	2019	1	5	4	4013	2	Plate Compactors	23	79	1	2.192764159	g/vehicle per day
2	2019	1	5	4	4013	2	Plate Compactors	23	87	1	2.669704491	g/vehicle per day
2	2019	1	5	4	4013	2	Plate Compactors	23	100	1	1.654421571	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	2	5	4	4013	2	Plate Compactors	23	1	1	2.667262314	g/vehicle per day
2	2019	2	5	4	4013	2	Plate Compactors	23	2	1	18.41769545	g/vehicle per day
2	2019	2	5	4	4013	2	Plate Compactors	23	3	1	21.91340661	g/vehicle per day
2	2019	2	5	4	4013	2	Plate Compactors	23	79	1	2.427703999	g/vehicle per day
2	2019	2	5	4	4013	2	Plate Compactors	23	87	1	2.955745159	g/vehicle per day
2	2019	2	5	4	4013	2	Plate Compactors	23	100	1	1.831680796	g/vehicle per day
2	2019	3	5	4	4013	2	Plate Compactors	23	1	1	2.698235747	g/vehicle per day
2	2019	3	5	4	4013	2	Plate Compactors	23	2	1	18.63157177	g/vehicle per day
2	2019	3	5	4	4013	2	Plate Compactors	23	3	1	22.16787936	g/vehicle per day
2	2019	3	5	4	4013	2	Plate Compactors	23	79	1	2.455895988	g/vehicle per day
2	2019	3	5	4	4013	2	Plate Compactors	23	87	1	2.990068133	g/vehicle per day
2	2019	3	5	4	4013	2	Plate Compactors	23	100	1	1.852951733	g/vehicle per day
2	2019	4	5	4	4013	2	Plate Compactors	23	1	1	2.78817692	g/vehicle per day
2	2019	4	5	4	4013	2	Plate Compactors	23	2	1	19.25262091	g/vehicle per day
2	2019	4	5	4	4013	2	Plate Compactors	23	3	1	22.90681259	g/vehicle per day
2	2019	4	5	4	4013	2	Plate Compactors	23	79	1	2.537758854	g/vehicle per day
2	2019	4	5	4	4013	2	Plate Compactors	23	87	1	3.08973678	g/vehicle per day
2	2019	4	5	4	4013	2	Plate Compactors	23	100	1	1.914716508	g/vehicle per day
2	2019	5	5	4	4013	2	Plate Compactors	23	1	1	2.698235747	g/vehicle per day
2	2019	5	5	4	4013	2	Plate Compactors	23	2	1	18.63157177	g/vehicle per day
2	2019	5	5	4	4013	2	Plate Compactors	23	3	1	22.16787936	g/vehicle per day
2	2019	5	5	4	4013	2	Plate Compactors	23	79	1	2.455895988	g/vehicle per day
2	2019	5	5	4	4013	2	Plate Compactors	23	87	1	2.990068133	g/vehicle per day
2	2019	5	5	4	4013	2	Plate Compactors	23	100	1	1.852951733	g/vehicle per day
2	2019	6	5	4	4013	2	Plate Compactors	23	1	1	3.020525554	g/vehicle per day
2	2019	6	5	4	4013	2	Plate Compactors	23	2	1	20.85700658	g/vehicle per day
2	2019	6	5	4	4013	2	Plate Compactors	23	3	1	24.81570787	g/vehicle per day
2	2019	6	5	4	4013	2	Plate Compactors	23	79	1	2.749239256	g/vehicle per day
2	2019	6	5	4	4013	2	Plate Compactors	23	87	1	3.347215998	g/vehicle per day
2	2019	6	5	4	4013	2	Plate Compactors	23	100	1	2.074276375	g/vehicle per day
2	2019	7	5	4	4013	2	Plate Compactors	23	1	1	2.923088455	g/vehicle per day
2	2019	7	5	4	4013	2	Plate Compactors	23	2	1	20.18420518	g/vehicle per day
2	2019	7	5	4	4013	2	Plate Compactors	23	3	1	24.01520628	g/vehicle per day
2	2019	7	5	4	4013	2	Plate Compactors	23	79	1	2.66055336	g/vehicle per day
2	2019	7	5	4	4013	2	Plate Compactors	23	87	1	3.239240325	g/vehicle per day
2	2019	7	5	4	4013	2	Plate Compactors	23	100	1	2.007364218	g/vehicle per day
2	2019	8	5	4	4013	2	Plate Compactors	23	1	1	2.923088455	g/vehicle per day
2	2019	8	5	4	4013	2	Plate Compactors	23	2	1	20.18420518	g/vehicle per day
2	2019	8	5	4	4013	2	Plate Compactors	23	3	1	24.01520628	g/vehicle per day
2	2019	8	5	4	4013	2	Plate Compactors	23	79	1	2.66055336	g/vehicle per day
2	2019	8	5	4	4013	2	Plate Compactors	23	87	1	3.239240325	g/vehicle per day
2	2019	8	5	4	4013	2	Plate Compactors	23	100	1	2.007364218	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	9	5	4	4013	2	Plate Compactors	23	1	1	2.78817692	g/vehicle per day
2	2019	9	5	4	4013	2	Plate Compactors	23	2	1	19.25262091	g/vehicle per day
2	2019	9	5	4	4013	2	Plate Compactors	23	3	1	22.90681259	g/vehicle per day
2	2019	9	5	4	4013	2	Plate Compactors	23	79	1	2.537758854	g/vehicle per day
2	2019	9	5	4	4013	2	Plate Compactors	23	87	1	3.08973678	g/vehicle per day
2	2019	9	5	4	4013	2	Plate Compactors	23	100	1	1.914716508	g/vehicle per day
2	2019	10	5	4	4013	2	Plate Compactors	23	1	1	2.698235747	g/vehicle per day
2	2019	10	5	4	4013	2	Plate Compactors	23	2	1	18.63157177	g/vehicle per day
2	2019	10	5	4	4013	2	Plate Compactors	23	3	1	22.16787936	g/vehicle per day
2	2019	10	5	4	4013	2	Plate Compactors	23	79	1	2.455895988	g/vehicle per day
2	2019	10	5	4	4013	2	Plate Compactors	23	87	1	2.990068133	g/vehicle per day
2	2019	10	5	4	4013	2	Plate Compactors	23	100	1	1.852951733	g/vehicle per day
2	2019	11	5	4	4013	2	Plate Compactors	23	1	1	2.78817692	g/vehicle per day
2	2019	11	5	4	4013	2	Plate Compactors	23	2	1	19.25262091	g/vehicle per day
2	2019	11	5	4	4013	2	Plate Compactors	23	3	1	22.90681259	g/vehicle per day
2	2019	11	5	4	4013	2	Plate Compactors	23	79	1	2.537758854	g/vehicle per day
2	2019	11	5	4	4013	2	Plate Compactors	23	87	1	3.08973678	g/vehicle per day
2	2019	11	5	4	4013	2	Plate Compactors	23	100	1	1.914716508	g/vehicle per day
2	2019	12	5	4	4013	2	Plate Compactors	23	1	1	2.409139229	g/vehicle per day
2	2019	12	5	4	4013	2	Plate Compactors	23	2	1	16.63533431	g/vehicle per day
2	2019	12	5	4	4013	2	Plate Compactors	23	3	1	19.79275352	g/vehicle per day
2	2019	12	5	4	4013	2	Plate Compactors	23	79	1	2.192764159	g/vehicle per day
2	2019	12	5	4	4013	2	Plate Compactors	23	87	1	2.669704491	g/vehicle per day
2	2019	12	5	4	4013	2	Plate Compactors	23	100	1	1.654421571	g/vehicle per day
2	2017	1	5	4	4013	2	Rollers	23	1	1	22.00277633	g/vehicle per day
2	2017	1	5	4	4013	2	Rollers	23	2	1	129.4726354	g/vehicle per day
2	2017	1	5	4	4013	2	Rollers	23	3	1	250.0772011	g/vehicle per day
2	2017	1	5	4	4013	2	Rollers	23	79	1	20.06216645	g/vehicle per day
2	2017	1	5	4	4013	2	Rollers	23	87	1	24.86205905	g/vehicle per day
2	2017	1	5	4	4013	2	Rollers	23	100	1	20.27411138	g/vehicle per day
2	2017	2	5	4	4013	2	Rollers	23	1	1	24.36020547	g/vehicle per day
2	2017	2	5	4	4013	2	Rollers	23	2	1	143.3447036	g/vehicle per day
2	2017	2	5	4	4013	2	Rollers	23	3	1	276.8711106	g/vehicle per day
2	2017	2	5	4	4013	2	Rollers	23	79	1	22.21167485	g/vehicle per day
2	2017	2	5	4	4013	2	Rollers	23	87	1	27.52583329	g/vehicle per day
2	2017	2	5	4	4013	2	Rollers	23	100	1	22.44633836	g/vehicle per day
2	2017	3	5	4	4013	2	Rollers	23	1	1	24.643092	g/vehicle per day
2	2017	3	5	4	4013	2	Rollers	23	2	1	145.0092696	g/vehicle per day
2	2017	3	5	4	4013	2	Rollers	23	3	1	280.0864155	g/vehicle per day
2	2017	3	5	4	4013	2	Rollers	23	79	1	22.46961079	g/vehicle per day
2	2017	3	5	4	4013	2	Rollers	23	87	1	27.84548581	g/vehicle per day
2	2017	3	5	4	4013	2	Rollers	23	100	1	22.7069947	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	4	5	4	4013	2	Rollers	23	1	1	25.46454226	g/vehicle per day
2	2017	4	5	4	4013	2	Rollers	23	2	1	149.8429618	g/vehicle per day
2	2017	4	5	4	4013	2	Rollers	23	3	1	289.4225394	g/vehicle per day
2	2017	4	5	4	4013	2	Rollers	23	79	1	23.2186103	g/vehicle per day
2	2017	4	5	4	4013	2	Rollers	23	87	1	28.77369302	g/vehicle per day
2	2017	4	5	4	4013	2	Rollers	23	100	1	23.46390265	g/vehicle per day
2	2017	5	5	4	4013	2	Rollers	23	1	1	24.643092	g/vehicle per day
2	2017	5	5	4	4013	2	Rollers	23	2	1	145.0092696	g/vehicle per day
2	2017	5	5	4	4013	2	Rollers	23	3	1	280.0864155	g/vehicle per day
2	2017	5	5	4	4013	2	Rollers	23	79	1	22.46961079	g/vehicle per day
2	2017	5	5	4	4013	2	Rollers	23	87	1	27.84548581	g/vehicle per day
2	2017	5	5	4	4013	2	Rollers	23	100	1	22.7069947	g/vehicle per day
2	2017	6	5	4	4013	2	Rollers	23	1	1	27.58658232	g/vehicle per day
2	2017	6	5	4	4013	2	Rollers	23	2	1	162.3298743	g/vehicle per day
2	2017	6	5	4	4013	2	Rollers	23	3	1	313.541143	g/vehicle per day
2	2017	6	5	4	4013	2	Rollers	23	79	1	25.15349541	g/vehicle per day
2	2017	6	5	4	4013	2	Rollers	23	87	1	31.17149024	g/vehicle per day
2	2017	6	5	4	4013	2	Rollers	23	100	1	25.41923118	g/vehicle per day
2	2017	7	5	4	4013	2	Rollers	23	1	1	26.69669612	g/vehicle per day
2	2017	7	5	4	4013	2	Rollers	23	2	1	157.0934359	g/vehicle per day
2	2017	7	5	4	4013	2	Rollers	23	3	1	303.4270082	g/vehicle per day
2	2017	7	5	4	4013	2	Rollers	23	79	1	24.34209462	g/vehicle per day
2	2017	7	5	4	4013	2	Rollers	23	87	1	30.16594476	g/vehicle per day
2	2017	7	5	4	4013	2	Rollers	23	100	1	24.59924751	g/vehicle per day
2	2017	8	5	4	4013	2	Rollers	23	1	1	26.69669612	g/vehicle per day
2	2017	8	5	4	4013	2	Rollers	23	2	1	157.0934359	g/vehicle per day
2	2017	8	5	4	4013	2	Rollers	23	3	1	303.4270082	g/vehicle per day
2	2017	8	5	4	4013	2	Rollers	23	79	1	24.34209462	g/vehicle per day
2	2017	8	5	4	4013	2	Rollers	23	87	1	30.16594476	g/vehicle per day
2	2017	8	5	4	4013	2	Rollers	23	100	1	24.59924751	g/vehicle per day
2	2017	9	5	4	4013	2	Rollers	23	1	1	25.46454226	g/vehicle per day
2	2017	9	5	4	4013	2	Rollers	23	2	1	149.8429618	g/vehicle per day
2	2017	9	5	4	4013	2	Rollers	23	3	1	289.4225394	g/vehicle per day
2	2017	9	5	4	4013	2	Rollers	23	79	1	23.2186103	g/vehicle per day
2	2017	9	5	4	4013	2	Rollers	23	87	1	28.77369302	g/vehicle per day
2	2017	9	5	4	4013	2	Rollers	23	100	1	23.46390265	g/vehicle per day
2	2017	10	5	4	4013	2	Rollers	23	1	1	24.643092	g/vehicle per day
2	2017	10	5	4	4013	2	Rollers	23	2	1	145.0092696	g/vehicle per day
2	2017	10	5	4	4013	2	Rollers	23	3	1	280.0864155	g/vehicle per day
2	2017	10	5	4	4013	2	Rollers	23	79	1	22.46961079	g/vehicle per day
2	2017	10	5	4	4013	2	Rollers	23	87	1	27.84548581	g/vehicle per day
2	2017	10	5	4	4013	2	Rollers	23	100	1	22.7069947	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	11	5	4	4013	2	Rollers	23	1	1	25.46454226	g/vehicle per day
2	2017	11	5	4	4013	2	Rollers	23	2	1	149.8429618	g/vehicle per day
2	2017	11	5	4	4013	2	Rollers	23	3	1	289.4225394	g/vehicle per day
2	2017	11	5	4	4013	2	Rollers	23	79	1	23.2186103	g/vehicle per day
2	2017	11	5	4	4013	2	Rollers	23	87	1	28.77369302	g/vehicle per day
2	2017	11	5	4	4013	2	Rollers	23	100	1	23.46390265	g/vehicle per day
2	2017	12	5	4	4013	2	Rollers	23	1	1	22.00277633	g/vehicle per day
2	2017	12	5	4	4013	2	Rollers	23	2	1	129.4726354	g/vehicle per day
2	2017	12	5	4	4013	2	Rollers	23	3	1	250.0772011	g/vehicle per day
2	2017	12	5	4	4013	2	Rollers	23	79	1	20.06216645	g/vehicle per day
2	2017	12	5	4	4013	2	Rollers	23	87	1	24.86205905	g/vehicle per day
2	2017	12	5	4	4013	2	Rollers	23	100	1	20.27411138	g/vehicle per day
1	2018	1	5	4	4013	2	Rollers	23	1	1	20.58162367	g/vehicle per day
1	2018	1	5	4	4013	2	Rollers	23	2	1	111.9174609	g/vehicle per day
1	2018	1	5	4	4013	2	Rollers	23	3	1	220.93199	g/vehicle per day
1	2018	1	5	4	4013	2	Rollers	23	79	1	18.72160758	g/vehicle per day
1	2018	1	5	4	4013	2	Rollers	23	87	1	23.36813041	g/vehicle per day
1	2018	1	5	4	4013	2	Rollers	23	100	1	17.29716944	g/vehicle per day
1	2018	2	5	4	4013	2	Rollers	23	1	1	22.78680243	g/vehicle per day
1	2018	2	5	4	4013	2	Rollers	23	2	1	123.9086079	g/vehicle per day
1	2018	2	5	4	4013	2	Rollers	23	3	1	244.6032696	g/vehicle per day
1	2018	2	5	4	4013	2	Rollers	23	79	1	20.72749678	g/vehicle per day
1	2018	2	5	4	4013	2	Rollers	23	87	1	25.87187802	g/vehicle per day
1	2018	2	5	4	4013	2	Rollers	23	100	1	19.15044457	g/vehicle per day
1	2018	3	5	4	4013	2	Rollers	23	1	1	23.05141726	g/vehicle per day
1	2018	3	5	4	4013	2	Rollers	23	2	1	125.3475413	g/vehicle per day
1	2018	3	5	4	4013	2	Rollers	23	3	1	247.4437825	g/vehicle per day
1	2018	3	5	4	4013	2	Rollers	23	79	1	20.96819153	g/vehicle per day
1	2018	3	5	4	4013	2	Rollers	23	87	1	26.17231029	g/vehicle per day
1	2018	3	5	4	4013	2	Rollers	23	100	1	19.37282622	g/vehicle per day
1	2018	4	5	4	4013	2	Rollers	23	1	1	23.81979434	g/vehicle per day
1	2018	4	5	4	4013	2	Rollers	23	2	1	129.5258114	g/vehicle per day
1	2018	4	5	4	4013	2	Rollers	23	3	1	255.6918647	g/vehicle per day
1	2018	4	5	4	4013	2	Rollers	23	79	1	21.66713183	g/vehicle per day
1	2018	4	5	4	4013	2	Rollers	23	87	1	27.04472029	g/vehicle per day
1	2018	4	5	4	4013	2	Rollers	23	100	1	20.01859238	g/vehicle per day
1	2018	5	5	4	4013	2	Rollers	23	1	1	23.05141726	g/vehicle per day
1	2018	5	5	4	4013	2	Rollers	23	2	1	125.3475413	g/vehicle per day
1	2018	5	5	4	4013	2	Rollers	23	3	1	247.4437825	g/vehicle per day
1	2018	5	5	4	4013	2	Rollers	23	79	1	20.96819153	g/vehicle per day
1	2018	5	5	4	4013	2	Rollers	23	87	1	26.17231029	g/vehicle per day
1	2018	5	5	4	4013	2	Rollers	23	100	1	19.37282622	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	6	5	4	4013	2	Rollers	23	1	1	25.80478232	g/vehicle per day
1	2018	6	5	4	4013	2	Rollers	23	2	1	140.3195933	g/vehicle per day
1	2018	6	5	4	4013	2	Rollers	23	3	1	276.9995944	g/vehicle per day
1	2018	6	5	4	4013	2	Rollers	23	79	1	23.47272477	g/vehicle per day
1	2018	6	5	4	4013	2	Rollers	23	87	1	29.29845649	g/vehicle per day
1	2018	6	5	4	4013	2	Rollers	23	100	1	21.68681064	g/vehicle per day
1	2018	7	5	4	4013	2	Rollers	23	1	1	24.97236822	g/vehicle per day
1	2018	7	5	4	4013	2	Rollers	23	2	1	135.7931281	g/vehicle per day
1	2018	7	5	4	4013	2	Rollers	23	3	1	268.0641452	g/vehicle per day
1	2018	7	5	4	4013	2	Rollers	23	79	1	22.71554042	g/vehicle per day
1	2018	7	5	4	4013	2	Rollers	23	87	1	28.35334092	g/vehicle per day
1	2018	7	5	4	4013	2	Rollers	23	100	1	20.98722648	g/vehicle per day
1	2018	8	5	4	4013	2	Rollers	23	1	1	24.97236822	g/vehicle per day
1	2018	8	5	4	4013	2	Rollers	23	2	1	135.7931281	g/vehicle per day
1	2018	8	5	4	4013	2	Rollers	23	3	1	268.0641452	g/vehicle per day
1	2018	8	5	4	4013	2	Rollers	23	79	1	22.71554042	g/vehicle per day
1	2018	8	5	4	4013	2	Rollers	23	87	1	28.35334092	g/vehicle per day
1	2018	8	5	4	4013	2	Rollers	23	100	1	20.98722648	g/vehicle per day
1	2018	9	5	4	4013	2	Rollers	23	1	1	23.81979434	g/vehicle per day
1	2018	9	5	4	4013	2	Rollers	23	2	1	129.5258114	g/vehicle per day
1	2018	9	5	4	4013	2	Rollers	23	3	1	255.6918647	g/vehicle per day
1	2018	9	5	4	4013	2	Rollers	23	79	1	21.66713183	g/vehicle per day
1	2018	9	5	4	4013	2	Rollers	23	87	1	27.04472029	g/vehicle per day
1	2018	9	5	4	4013	2	Rollers	23	100	1	20.01859238	g/vehicle per day
1	2018	10	5	4	4013	2	Rollers	23	1	1	23.05141726	g/vehicle per day
1	2018	10	5	4	4013	2	Rollers	23	2	1	125.3475413	g/vehicle per day
1	2018	10	5	4	4013	2	Rollers	23	3	1	247.4437825	g/vehicle per day
1	2018	10	5	4	4013	2	Rollers	23	79	1	20.96819153	g/vehicle per day
1	2018	10	5	4	4013	2	Rollers	23	87	1	26.17231029	g/vehicle per day
1	2018	10	5	4	4013	2	Rollers	23	100	1	19.37282622	g/vehicle per day
1	2018	11	5	4	4013	2	Rollers	23	1	1	23.81979434	g/vehicle per day
1	2018	11	5	4	4013	2	Rollers	23	2	1	129.5258114	g/vehicle per day
1	2018	11	5	4	4013	2	Rollers	23	3	1	255.6918647	g/vehicle per day
1	2018	11	5	4	4013	2	Rollers	23	79	1	21.66713183	g/vehicle per day
1	2018	11	5	4	4013	2	Rollers	23	87	1	27.04472029	g/vehicle per day
1	2018	11	5	4	4013	2	Rollers	23	100	1	20.01859238	g/vehicle per day
1	2018	12	5	4	4013	2	Rollers	23	1	1	20.58162367	g/vehicle per day
1	2018	12	5	4	4013	2	Rollers	23	2	1	111.9174609	g/vehicle per day
1	2018	12	5	4	4013	2	Rollers	23	3	1	220.93199	g/vehicle per day
1	2018	12	5	4	4013	2	Rollers	23	79	1	18.72160758	g/vehicle per day
1	2018	12	5	4	4013	2	Rollers	23	87	1	23.36813041	g/vehicle per day
1	2018	12	5	4	4013	2	Rollers	23	100	1	17.29716944	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	1	5	4	4013	2	Rollers	23	1	1	20.58162367	g/vehicle per day
2	2018	1	5	4	4013	2	Rollers	23	2	1	111.9174609	g/vehicle per day
2	2018	1	5	4	4013	2	Rollers	23	3	1	220.93199	g/vehicle per day
2	2018	1	5	4	4013	2	Rollers	23	79	1	18.72160758	g/vehicle per day
2	2018	1	5	4	4013	2	Rollers	23	87	1	23.36813041	g/vehicle per day
2	2018	1	5	4	4013	2	Rollers	23	100	1	17.29716944	g/vehicle per day
2	2018	2	5	4	4013	2	Rollers	23	1	1	22.78680243	g/vehicle per day
2	2018	2	5	4	4013	2	Rollers	23	2	1	123.9086079	g/vehicle per day
2	2018	2	5	4	4013	2	Rollers	23	3	1	244.6032696	g/vehicle per day
2	2018	2	5	4	4013	2	Rollers	23	79	1	20.72749678	g/vehicle per day
2	2018	2	5	4	4013	2	Rollers	23	87	1	25.87187802	g/vehicle per day
2	2018	2	5	4	4013	2	Rollers	23	100	1	19.15044457	g/vehicle per day
2	2018	3	5	4	4013	2	Rollers	23	1	1	23.05141726	g/vehicle per day
2	2018	3	5	4	4013	2	Rollers	23	2	1	125.3475413	g/vehicle per day
2	2018	3	5	4	4013	2	Rollers	23	3	1	247.4437825	g/vehicle per day
2	2018	3	5	4	4013	2	Rollers	23	79	1	20.96819153	g/vehicle per day
2	2018	3	5	4	4013	2	Rollers	23	87	1	26.17231029	g/vehicle per day
2	2018	3	5	4	4013	2	Rollers	23	100	1	19.37282622	g/vehicle per day
2	2018	4	5	4	4013	2	Rollers	23	1	1	23.81979434	g/vehicle per day
2	2018	4	5	4	4013	2	Rollers	23	2	1	129.5258114	g/vehicle per day
2	2018	4	5	4	4013	2	Rollers	23	3	1	255.6918647	g/vehicle per day
2	2018	4	5	4	4013	2	Rollers	23	79	1	21.66713183	g/vehicle per day
2	2018	4	5	4	4013	2	Rollers	23	87	1	27.04472029	g/vehicle per day
2	2018	4	5	4	4013	2	Rollers	23	100	1	20.01859238	g/vehicle per day
2	2018	5	5	4	4013	2	Rollers	23	1	1	23.05141726	g/vehicle per day
2	2018	5	5	4	4013	2	Rollers	23	2	1	125.3475413	g/vehicle per day
2	2018	5	5	4	4013	2	Rollers	23	3	1	247.4437825	g/vehicle per day
2	2018	5	5	4	4013	2	Rollers	23	79	1	20.96819153	g/vehicle per day
2	2018	5	5	4	4013	2	Rollers	23	87	1	26.17231029	g/vehicle per day
2	2018	5	5	4	4013	2	Rollers	23	100	1	19.37282622	g/vehicle per day
2	2018	6	5	4	4013	2	Rollers	23	1	1	25.80478232	g/vehicle per day
2	2018	6	5	4	4013	2	Rollers	23	2	1	140.3195933	g/vehicle per day
2	2018	6	5	4	4013	2	Rollers	23	3	1	276.9995944	g/vehicle per day
2	2018	6	5	4	4013	2	Rollers	23	79	1	23.47272477	g/vehicle per day
2	2018	6	5	4	4013	2	Rollers	23	87	1	29.29845649	g/vehicle per day
2	2018	6	5	4	4013	2	Rollers	23	100	1	21.68681064	g/vehicle per day
2	2018	7	5	4	4013	2	Rollers	23	1	1	24.97236822	g/vehicle per day
2	2018	7	5	4	4013	2	Rollers	23	2	1	135.7931281	g/vehicle per day
2	2018	7	5	4	4013	2	Rollers	23	3	1	268.0641452	g/vehicle per day
2	2018	7	5	4	4013	2	Rollers	23	79	1	22.71554042	g/vehicle per day
2	2018	7	5	4	4013	2	Rollers	23	87	1	28.35334092	g/vehicle per day
2	2018	7	5	4	4013	2	Rollers	23	100	1	20.98722648	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	8	5	4	4013	2	Rollers	23	1	1	24.97236822	g/vehicle per day
2	2018	8	5	4	4013	2	Rollers	23	2	1	135.7931281	g/vehicle per day
2	2018	8	5	4	4013	2	Rollers	23	3	1	268.0641452	g/vehicle per day
2	2018	8	5	4	4013	2	Rollers	23	79	1	22.71554042	g/vehicle per day
2	2018	8	5	4	4013	2	Rollers	23	87	1	28.35334092	g/vehicle per day
2	2018	8	5	4	4013	2	Rollers	23	100	1	20.98722648	g/vehicle per day
2	2018	9	5	4	4013	2	Rollers	23	1	1	23.81979434	g/vehicle per day
2	2018	9	5	4	4013	2	Rollers	23	2	1	129.5258114	g/vehicle per day
2	2018	9	5	4	4013	2	Rollers	23	3	1	255.6918647	g/vehicle per day
2	2018	9	5	4	4013	2	Rollers	23	79	1	21.66713183	g/vehicle per day
2	2018	9	5	4	4013	2	Rollers	23	87	1	27.04472029	g/vehicle per day
2	2018	9	5	4	4013	2	Rollers	23	100	1	20.01859238	g/vehicle per day
2	2018	10	5	4	4013	2	Rollers	23	1	1	23.05141726	g/vehicle per day
2	2018	10	5	4	4013	2	Rollers	23	2	1	125.3475413	g/vehicle per day
2	2018	10	5	4	4013	2	Rollers	23	3	1	247.4437825	g/vehicle per day
2	2018	10	5	4	4013	2	Rollers	23	79	1	20.96819153	g/vehicle per day
2	2018	10	5	4	4013	2	Rollers	23	87	1	26.17231029	g/vehicle per day
2	2018	10	5	4	4013	2	Rollers	23	100	1	19.37282622	g/vehicle per day
2	2018	11	5	4	4013	2	Rollers	23	1	1	23.81979434	g/vehicle per day
2	2018	11	5	4	4013	2	Rollers	23	2	1	129.5258114	g/vehicle per day
2	2018	11	5	4	4013	2	Rollers	23	3	1	255.6918647	g/vehicle per day
2	2018	11	5	4	4013	2	Rollers	23	79	1	21.66713183	g/vehicle per day
2	2018	11	5	4	4013	2	Rollers	23	87	1	27.04472029	g/vehicle per day
2	2018	11	5	4	4013	2	Rollers	23	100	1	20.01859238	g/vehicle per day
2	2018	12	5	4	4013	2	Rollers	23	1	1	20.58162367	g/vehicle per day
2	2018	12	5	4	4013	2	Rollers	23	2	1	111.9174609	g/vehicle per day
2	2018	12	5	4	4013	2	Rollers	23	3	1	220.93199	g/vehicle per day
2	2018	12	5	4	4013	2	Rollers	23	79	1	18.72160758	g/vehicle per day
2	2018	12	5	4	4013	2	Rollers	23	87	1	23.36813041	g/vehicle per day
2	2018	12	5	4	4013	2	Rollers	23	100	1	17.29716944	g/vehicle per day
2	2019	1	5	4	4013	2	Rollers	23	1	1	19.56550967	g/vehicle per day
2	2019	1	5	4	4013	2	Rollers	23	2	1	96.28107359	g/vehicle per day
2	2019	1	5	4	4013	2	Rollers	23	3	1	196.0882901	g/vehicle per day
2	2019	1	5	4	4013	2	Rollers	23	79	1	17.75800701	g/vehicle per day
2	2019	1	5	4	4013	2	Rollers	23	87	1	22.31618643	g/vehicle per day
2	2019	1	5	4	4013	2	Rollers	23	100	1	14.41613265	g/vehicle per day
2	2019	2	5	4	4013	2	Rollers	23	1	1	21.66181328	g/vehicle per day
2	2019	2	5	4	4013	2	Rollers	23	2	1	106.5969207	g/vehicle per day
2	2019	2	5	4	4013	2	Rollers	23	3	1	217.0978261	g/vehicle per day
2	2019	2	5	4	4013	2	Rollers	23	79	1	19.6606599	g/vehicle per day
2	2019	2	5	4	4013	2	Rollers	23	87	1	24.7072114	g/vehicle per day
2	2019	2	5	4	4013	2	Rollers	23	100	1	15.9607237	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	3	5	4	4013	2	Rollers	23	1	1	21.91336361	g/vehicle per day
2	2019	3	5	4	4013	2	Rollers	23	2	1	107.8347664	g/vehicle per day
2	2019	3	5	4	4013	2	Rollers	23	3	1	219.6188472	g/vehicle per day
2	2019	3	5	4	4013	2	Rollers	23	79	1	19.88896486	g/vehicle per day
2	2019	3	5	4	4013	2	Rollers	23	87	1	24.99412879	g/vehicle per day
2	2019	3	5	4	4013	2	Rollers	23	100	1	16.14607361	g/vehicle per day
2	2019	4	5	4	4013	2	Rollers	23	1	1	22.6438082	g/vehicle per day
2	2019	4	5	4	4013	2	Rollers	23	2	1	111.4292469	g/vehicle per day
2	2019	4	5	4	4013	2	Rollers	23	3	1	226.9394929	g/vehicle per day
2	2019	4	5	4	4013	2	Rollers	23	79	1	20.55193534	g/vehicle per day
2	2019	4	5	4	4013	2	Rollers	23	87	1	25.82725266	g/vehicle per day
2	2019	4	5	4	4013	2	Rollers	23	100	1	16.68427259	g/vehicle per day
2	2019	5	5	4	4013	2	Rollers	23	1	1	21.91336361	g/vehicle per day
2	2019	5	5	4	4013	2	Rollers	23	2	1	107.8347664	g/vehicle per day
2	2019	5	5	4	4013	2	Rollers	23	3	1	219.6188472	g/vehicle per day
2	2019	5	5	4	4013	2	Rollers	23	79	1	19.88896486	g/vehicle per day
2	2019	5	5	4	4013	2	Rollers	23	87	1	24.99412879	g/vehicle per day
2	2019	5	5	4	4013	2	Rollers	23	100	1	16.14607361	g/vehicle per day
2	2019	6	5	4	4013	2	Rollers	23	1	1	24.5307949	g/vehicle per day
2	2019	6	5	4	4013	2	Rollers	23	2	1	120.7149957	g/vehicle per day
2	2019	6	5	4	4013	2	Rollers	23	3	1	245.8511378	g/vehicle per day
2	2019	6	5	4	4013	2	Rollers	23	79	1	22.26459179	g/vehicle per day
2	2019	6	5	4	4013	2	Rollers	23	87	1	27.97953543	g/vehicle per day
2	2019	6	5	4	4013	2	Rollers	23	100	1	18.07463031	g/vehicle per day
2	2019	7	5	4	4013	2	Rollers	23	1	1	23.73947133	g/vehicle per day
2	2019	7	5	4	4013	2	Rollers	23	2	1	116.8209651	g/vehicle per day
2	2019	7	5	4	4013	2	Rollers	23	3	1	237.920385	g/vehicle per day
2	2019	7	5	4	4013	2	Rollers	23	79	1	21.54637298	g/vehicle per day
2	2019	7	5	4	4013	2	Rollers	23	87	1	27.07695889	g/vehicle per day
2	2019	7	5	4	4013	2	Rollers	23	100	1	17.49157477	g/vehicle per day
2	2019	8	5	4	4013	2	Rollers	23	1	1	23.73947133	g/vehicle per day
2	2019	8	5	4	4013	2	Rollers	23	2	1	116.8209651	g/vehicle per day
2	2019	8	5	4	4013	2	Rollers	23	3	1	237.920385	g/vehicle per day
2	2019	8	5	4	4013	2	Rollers	23	79	1	21.54637298	g/vehicle per day
2	2019	8	5	4	4013	2	Rollers	23	87	1	27.07695889	g/vehicle per day
2	2019	8	5	4	4013	2	Rollers	23	100	1	17.49157477	g/vehicle per day
2	2019	9	5	4	4013	2	Rollers	23	1	1	22.6438082	g/vehicle per day
2	2019	9	5	4	4013	2	Rollers	23	2	1	111.4292469	g/vehicle per day
2	2019	9	5	4	4013	2	Rollers	23	3	1	226.9394929	g/vehicle per day
2	2019	9	5	4	4013	2	Rollers	23	79	1	20.55193534	g/vehicle per day
2	2019	9	5	4	4013	2	Rollers	23	87	1	25.82725266	g/vehicle per day
2	2019	9	5	4	4013	2	Rollers	23	100	1	16.68427259	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	10	5	4	4013	2	Rollers	23	1	1	21.91336361	g/vehicle per day
2	2019	10	5	4	4013	2	Rollers	23	2	1	107.8347664	g/vehicle per day
2	2019	10	5	4	4013	2	Rollers	23	3	1	219.6188472	g/vehicle per day
2	2019	10	5	4	4013	2	Rollers	23	79	1	19.88896486	g/vehicle per day
2	2019	10	5	4	4013	2	Rollers	23	87	1	24.99412879	g/vehicle per day
2	2019	10	5	4	4013	2	Rollers	23	100	1	16.14607361	g/vehicle per day
2	2019	11	5	4	4013	2	Rollers	23	1	1	22.6438082	g/vehicle per day
2	2019	11	5	4	4013	2	Rollers	23	2	1	111.4292469	g/vehicle per day
2	2019	11	5	4	4013	2	Rollers	23	3	1	226.9394929	g/vehicle per day
2	2019	11	5	4	4013	2	Rollers	23	79	1	20.55193534	g/vehicle per day
2	2019	11	5	4	4013	2	Rollers	23	87	1	25.82725266	g/vehicle per day
2	2019	11	5	4	4013	2	Rollers	23	100	1	16.68427259	g/vehicle per day
2	2019	12	5	4	4013	2	Rollers	23	1	1	19.56550967	g/vehicle per day
2	2019	12	5	4	4013	2	Rollers	23	2	1	96.28107359	g/vehicle per day
2	2019	12	5	4	4013	2	Rollers	23	3	1	196.0882901	g/vehicle per day
2	2019	12	5	4	4013	2	Rollers	23	79	1	17.75800701	g/vehicle per day
2	2019	12	5	4	4013	2	Rollers	23	87	1	22.31618643	g/vehicle per day
2	2019	12	5	4	4013	2	Rollers	23	100	1	14.41613265	g/vehicle per day
2	2017	1	5	4	4013	2	Rubber Tire Loaders	23	1	1	56.02816763	g/vehicle per day
2	2017	1	5	4	4013	2	Rubber Tire Loaders	23	2	1	279.5561293	g/vehicle per day
2	2017	1	5	4	4013	2	Rubber Tire Loaders	23	3	1	688.7321924	g/vehicle per day
2	2017	1	5	4	4013	2	Rubber Tire Loaders	23	79	1	51.48166019	g/vehicle per day
2	2017	1	5	4	4013	2	Rubber Tire Loaders	23	87	1	63.35656089	g/vehicle per day
2	2017	1	5	4	4013	2	Rubber Tire Loaders	23	100	1	43.35036107	g/vehicle per day
2	2017	2	5	4	4013	2	Rubber Tire Loaders	23	1	1	62.03119174	g/vehicle per day
2	2017	2	5	4	4013	2	Rubber Tire Loaders	23	2	1	309.5085423	g/vehicle per day
2	2017	2	5	4	4013	2	Rubber Tire Loaders	23	3	1	762.5249529	g/vehicle per day
2	2017	2	5	4	4013	2	Rubber Tire Loaders	23	79	1	56.99753891	g/vehicle per day
2	2017	2	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.14478465	g/vehicle per day
2	2017	2	5	4	4013	2	Rubber Tire Loaders	23	100	1	47.99504914	g/vehicle per day
2	2017	3	5	4	4013	2	Rubber Tire Loaders	23	1	1	62.75155115	g/vehicle per day
2	2017	3	5	4	4013	2	Rubber Tire Loaders	23	2	1	313.1027302	g/vehicle per day
2	2017	3	5	4	4013	2	Rubber Tire Loaders	23	3	1	771.3798068	g/vehicle per day
2	2017	3	5	4	4013	2	Rubber Tire Loaders	23	79	1	57.65945312	g/vehicle per day
2	2017	3	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.9593667	g/vehicle per day
2	2017	3	5	4	4013	2	Rubber Tire Loaders	23	100	1	48.55238887	g/vehicle per day
2	2017	4	5	4	4013	2	Rubber Tire Loaders	23	1	1	64.84327435	g/vehicle per day
2	2017	4	5	4	4013	2	Rubber Tire Loaders	23	2	1	323.5396514	g/vehicle per day
2	2017	4	5	4	4013	2	Rubber Tire Loaders	23	3	1	797.0926811	g/vehicle per day
2	2017	4	5	4	4013	2	Rubber Tire Loaders	23	79	1	59.58143432	g/vehicle per day
2	2017	4	5	4	4013	2	Rubber Tire Loaders	23	87	1	73.32468476	g/vehicle per day
2	2017	4	5	4	4013	2	Rubber Tire Loaders	23	100	1	50.17080809	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	5	5	4	4013	2	Rubber Tire Loaders	23	1	1	62.75155115	g/vehicle per day
2	2017	5	5	4	4013	2	Rubber Tire Loaders	23	2	1	313.1027302	g/vehicle per day
2	2017	5	5	4	4013	2	Rubber Tire Loaders	23	3	1	771.3798068	g/vehicle per day
2	2017	5	5	4	4013	2	Rubber Tire Loaders	23	79	1	57.65945312	g/vehicle per day
2	2017	5	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.9593667	g/vehicle per day
2	2017	5	5	4	4013	2	Rubber Tire Loaders	23	100	1	48.55238887	g/vehicle per day
2	2017	6	5	4	4013	2	Rubber Tire Loaders	23	1	1	70.24688127	g/vehicle per day
2	2017	6	5	4	4013	2	Rubber Tire Loaders	23	2	1	350.5010821	g/vehicle per day
2	2017	6	5	4	4013	2	Rubber Tire Loaders	23	3	1	863.5169373	g/vehicle per day
2	2017	6	5	4	4013	2	Rubber Tire Loaders	23	79	1	64.54655803	g/vehicle per day
2	2017	6	5	4	4013	2	Rubber Tire Loaders	23	87	1	79.43506925	g/vehicle per day
2	2017	6	5	4	4013	2	Rubber Tire Loaders	23	100	1	54.35171993	g/vehicle per day
2	2017	7	5	4	4013	2	Rubber Tire Loaders	23	1	1	67.98084728	g/vehicle per day
2	2017	7	5	4	4013	2	Rubber Tire Loaders	23	2	1	339.194727	g/vehicle per day
2	2017	7	5	4	4013	2	Rubber Tire Loaders	23	3	1	835.6616363	g/vehicle per day
2	2017	7	5	4	4013	2	Rubber Tire Loaders	23	79	1	62.46440573	g/vehicle per day
2	2017	7	5	4	4013	2	Rubber Tire Loaders	23	87	1	76.87265357	g/vehicle per day
2	2017	7	5	4	4013	2	Rubber Tire Loaders	23	100	1	52.59841725	g/vehicle per day
2	2017	8	5	4	4013	2	Rubber Tire Loaders	23	1	1	67.98084728	g/vehicle per day
2	2017	8	5	4	4013	2	Rubber Tire Loaders	23	2	1	339.194727	g/vehicle per day
2	2017	8	5	4	4013	2	Rubber Tire Loaders	23	3	1	835.6616363	g/vehicle per day
2	2017	8	5	4	4013	2	Rubber Tire Loaders	23	79	1	62.46440573	g/vehicle per day
2	2017	8	5	4	4013	2	Rubber Tire Loaders	23	87	1	76.87265357	g/vehicle per day
2	2017	8	5	4	4013	2	Rubber Tire Loaders	23	100	1	52.59841725	g/vehicle per day
2	2017	9	5	4	4013	2	Rubber Tire Loaders	23	1	1	64.84327435	g/vehicle per day
2	2017	9	5	4	4013	2	Rubber Tire Loaders	23	2	1	323.5396514	g/vehicle per day
2	2017	9	5	4	4013	2	Rubber Tire Loaders	23	3	1	797.0926811	g/vehicle per day
2	2017	9	5	4	4013	2	Rubber Tire Loaders	23	79	1	59.58143432	g/vehicle per day
2	2017	9	5	4	4013	2	Rubber Tire Loaders	23	87	1	73.32468476	g/vehicle per day
2	2017	9	5	4	4013	2	Rubber Tire Loaders	23	100	1	50.17080809	g/vehicle per day
2	2017	10	5	4	4013	2	Rubber Tire Loaders	23	1	1	62.75155115	g/vehicle per day
2	2017	10	5	4	4013	2	Rubber Tire Loaders	23	2	1	313.1027302	g/vehicle per day
2	2017	10	5	4	4013	2	Rubber Tire Loaders	23	3	1	771.3798068	g/vehicle per day
2	2017	10	5	4	4013	2	Rubber Tire Loaders	23	79	1	57.65945312	g/vehicle per day
2	2017	10	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.9593667	g/vehicle per day
2	2017	10	5	4	4013	2	Rubber Tire Loaders	23	100	1	48.55238887	g/vehicle per day
2	2017	11	5	4	4013	2	Rubber Tire Loaders	23	1	1	64.84327435	g/vehicle per day
2	2017	11	5	4	4013	2	Rubber Tire Loaders	23	2	1	323.5396514	g/vehicle per day
2	2017	11	5	4	4013	2	Rubber Tire Loaders	23	3	1	797.0926811	g/vehicle per day
2	2017	11	5	4	4013	2	Rubber Tire Loaders	23	79	1	59.58143432	g/vehicle per day
2	2017	11	5	4	4013	2	Rubber Tire Loaders	23	87	1	73.32468476	g/vehicle per day
2	2017	11	5	4	4013	2	Rubber Tire Loaders	23	100	1	50.17080809	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	12	5	4	4013	2	Rubber Tire Loaders	23	1	1	56.02816763	g/vehicle per day
2	2017	12	5	4	4013	2	Rubber Tire Loaders	23	2	1	279.5561293	g/vehicle per day
2	2017	12	5	4	4013	2	Rubber Tire Loaders	23	3	1	688.7321924	g/vehicle per day
2	2017	12	5	4	4013	2	Rubber Tire Loaders	23	79	1	51.48166019	g/vehicle per day
2	2017	12	5	4	4013	2	Rubber Tire Loaders	23	87	1	63.35656089	g/vehicle per day
2	2017	12	5	4	4013	2	Rubber Tire Loaders	23	100	1	43.35036107	g/vehicle per day
1	2018	1	5	4	4013	2	Rubber Tire Loaders	23	1	1	53.32454778	g/vehicle per day
1	2018	1	5	4	4013	2	Rubber Tire Loaders	23	2	1	246.662572	g/vehicle per day
1	2018	1	5	4	4013	2	Rubber Tire Loaders	23	3	1	612.3301013	g/vehicle per day
1	2018	1	5	4	4013	2	Rubber Tire Loaders	23	79	1	48.84643432	g/vehicle per day
1	2018	1	5	4	4013	2	Rubber Tire Loaders	23	87	1	60.60957626	g/vehicle per day
1	2018	1	5	4	4013	2	Rubber Tire Loaders	23	100	1	37.88073125	g/vehicle per day
1	2018	2	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.03789909	g/vehicle per day
1	2018	2	5	4	4013	2	Rubber Tire Loaders	23	2	1	273.0906795	g/vehicle per day
1	2018	2	5	4	4013	2	Rubber Tire Loaders	23	3	1	677.9368812	g/vehicle per day
1	2018	2	5	4	4013	2	Rubber Tire Loaders	23	79	1	54.0799901	g/vehicle per day
1	2018	2	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.1034715	g/vehicle per day
1	2018	2	5	4	4013	2	Rubber Tire Loaders	23	100	1	41.93940038	g/vehicle per day
1	2018	3	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.72349151	g/vehicle per day
1	2018	3	5	4	4013	2	Rubber Tire Loaders	23	2	1	276.2620065	g/vehicle per day
1	2018	3	5	4	4013	2	Rubber Tire Loaders	23	3	1	685.8094524	g/vehicle per day
1	2018	3	5	4	4013	2	Rubber Tire Loaders	23	79	1	54.70799765	g/vehicle per day
1	2018	3	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.88271612	g/vehicle per day
1	2018	3	5	4	4013	2	Rubber Tire Loaders	23	100	1	42.4264161	g/vehicle per day
1	2018	4	5	4	4013	2	Rubber Tire Loaders	23	1	1	61.71426488	g/vehicle per day
1	2018	4	5	4	4013	2	Rubber Tire Loaders	23	2	1	285.470817	g/vehicle per day
1	2018	4	5	4	4013	2	Rubber Tire Loaders	23	3	1	708.6699442	g/vehicle per day
1	2018	4	5	4	4013	2	Rubber Tire Loaders	23	79	1	56.53160738	g/vehicle per day
1	2018	4	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.14546316	g/vehicle per day
1	2018	4	5	4	4013	2	Rubber Tire Loaders	23	100	1	43.84064268	g/vehicle per day
1	2018	5	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.72349151	g/vehicle per day
1	2018	5	5	4	4013	2	Rubber Tire Loaders	23	2	1	276.2620065	g/vehicle per day
1	2018	5	5	4	4013	2	Rubber Tire Loaders	23	3	1	685.8094524	g/vehicle per day
1	2018	5	5	4	4013	2	Rubber Tire Loaders	23	79	1	54.70799765	g/vehicle per day
1	2018	5	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.88271612	g/vehicle per day
1	2018	5	5	4	4013	2	Rubber Tire Loaders	23	100	1	42.4264161	g/vehicle per day
1	2018	6	5	4	4013	2	Rubber Tire Loaders	23	1	1	66.85713651	g/vehicle per day
1	2018	6	5	4	4013	2	Rubber Tire Loaders	23	2	1	309.2599945	g/vehicle per day
1	2018	6	5	4	4013	2	Rubber Tire Loaders	23	3	1	767.7257945	g/vehicle per day
1	2018	6	5	4	4013	2	Rubber Tire Loaders	23	79	1	61.24257718	g/vehicle per day
1	2018	6	5	4	4013	2	Rubber Tire Loaders	23	87	1	75.99095379	g/vehicle per day
1	2018	6	5	4	4013	2	Rubber Tire Loaders	23	100	1	47.49402218	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	7	5	4	4013	2	Rubber Tire Loaders	23	1	1	64.70043371	g/vehicle per day
1	2018	7	5	4	4013	2	Rubber Tire Loaders	23	2	1	299.283885	g/vehicle per day
1	2018	7	5	4	4013	2	Rubber Tire Loaders	23	3	1	742.9602824	g/vehicle per day
1	2018	7	5	4	4013	2	Rubber Tire Loaders	23	79	1	59.26699864	g/vehicle per day
1	2018	7	5	4	4013	2	Rubber Tire Loaders	23	87	1	73.53960306	g/vehicle per day
1	2018	7	5	4	4013	2	Rubber Tire Loaders	23	100	1	45.96196036	g/vehicle per day
1	2018	8	5	4	4013	2	Rubber Tire Loaders	23	1	1	64.70043371	g/vehicle per day
1	2018	8	5	4	4013	2	Rubber Tire Loaders	23	2	1	299.283885	g/vehicle per day
1	2018	8	5	4	4013	2	Rubber Tire Loaders	23	3	1	742.9602824	g/vehicle per day
1	2018	8	5	4	4013	2	Rubber Tire Loaders	23	79	1	59.26699864	g/vehicle per day
1	2018	8	5	4	4013	2	Rubber Tire Loaders	23	87	1	73.53960306	g/vehicle per day
1	2018	8	5	4	4013	2	Rubber Tire Loaders	23	100	1	45.96196036	g/vehicle per day
1	2018	9	5	4	4013	2	Rubber Tire Loaders	23	1	1	61.71426488	g/vehicle per day
1	2018	9	5	4	4013	2	Rubber Tire Loaders	23	2	1	285.470817	g/vehicle per day
1	2018	9	5	4	4013	2	Rubber Tire Loaders	23	3	1	708.6699442	g/vehicle per day
1	2018	9	5	4	4013	2	Rubber Tire Loaders	23	79	1	56.53160738	g/vehicle per day
1	2018	9	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.14546316	g/vehicle per day
1	2018	9	5	4	4013	2	Rubber Tire Loaders	23	100	1	43.84064268	g/vehicle per day
1	2018	10	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.72349151	g/vehicle per day
1	2018	10	5	4	4013	2	Rubber Tire Loaders	23	2	1	276.2620065	g/vehicle per day
1	2018	10	5	4	4013	2	Rubber Tire Loaders	23	3	1	685.8094524	g/vehicle per day
1	2018	10	5	4	4013	2	Rubber Tire Loaders	23	79	1	54.70799765	g/vehicle per day
1	2018	10	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.88271612	g/vehicle per day
1	2018	10	5	4	4013	2	Rubber Tire Loaders	23	100	1	42.4264161	g/vehicle per day
1	2018	11	5	4	4013	2	Rubber Tire Loaders	23	1	1	61.71426488	g/vehicle per day
1	2018	11	5	4	4013	2	Rubber Tire Loaders	23	2	1	285.470817	g/vehicle per day
1	2018	11	5	4	4013	2	Rubber Tire Loaders	23	3	1	708.6699442	g/vehicle per day
1	2018	11	5	4	4013	2	Rubber Tire Loaders	23	79	1	56.53160738	g/vehicle per day
1	2018	11	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.14546316	g/vehicle per day
1	2018	11	5	4	4013	2	Rubber Tire Loaders	23	100	1	43.84064268	g/vehicle per day
1	2018	12	5	4	4013	2	Rubber Tire Loaders	23	1	1	53.32454778	g/vehicle per day
1	2018	12	5	4	4013	2	Rubber Tire Loaders	23	2	1	246.662572	g/vehicle per day
1	2018	12	5	4	4013	2	Rubber Tire Loaders	23	3	1	612.3301013	g/vehicle per day
1	2018	12	5	4	4013	2	Rubber Tire Loaders	23	79	1	48.84643432	g/vehicle per day
1	2018	12	5	4	4013	2	Rubber Tire Loaders	23	87	1	60.60957626	g/vehicle per day
1	2018	12	5	4	4013	2	Rubber Tire Loaders	23	100	1	37.88073125	g/vehicle per day
2	2018	1	5	4	4013	2	Rubber Tire Loaders	23	1	1	53.32454778	g/vehicle per day
2	2018	1	5	4	4013	2	Rubber Tire Loaders	23	2	1	246.662572	g/vehicle per day
2	2018	1	5	4	4013	2	Rubber Tire Loaders	23	3	1	612.3301013	g/vehicle per day
2	2018	1	5	4	4013	2	Rubber Tire Loaders	23	79	1	48.84643432	g/vehicle per day
2	2018	1	5	4	4013	2	Rubber Tire Loaders	23	87	1	60.60957626	g/vehicle per day
2	2018	1	5	4	4013	2	Rubber Tire Loaders	23	100	1	37.88073125	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	2	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.03789909	g/vehicle per day
2	2018	2	5	4	4013	2	Rubber Tire Loaders	23	2	1	273.0906795	g/vehicle per day
2	2018	2	5	4	4013	2	Rubber Tire Loaders	23	3	1	677.9368812	g/vehicle per day
2	2018	2	5	4	4013	2	Rubber Tire Loaders	23	79	1	54.0799901	g/vehicle per day
2	2018	2	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.1034715	g/vehicle per day
2	2018	2	5	4	4013	2	Rubber Tire Loaders	23	100	1	41.93940038	g/vehicle per day
2	2018	3	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.72349151	g/vehicle per day
2	2018	3	5	4	4013	2	Rubber Tire Loaders	23	2	1	276.2620065	g/vehicle per day
2	2018	3	5	4	4013	2	Rubber Tire Loaders	23	3	1	685.8094524	g/vehicle per day
2	2018	3	5	4	4013	2	Rubber Tire Loaders	23	79	1	54.70799765	g/vehicle per day
2	2018	3	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.88271612	g/vehicle per day
2	2018	3	5	4	4013	2	Rubber Tire Loaders	23	100	1	42.4264161	g/vehicle per day
2	2018	4	5	4	4013	2	Rubber Tire Loaders	23	1	1	61.71426488	g/vehicle per day
2	2018	4	5	4	4013	2	Rubber Tire Loaders	23	2	1	285.470817	g/vehicle per day
2	2018	4	5	4	4013	2	Rubber Tire Loaders	23	3	1	708.6699442	g/vehicle per day
2	2018	4	5	4	4013	2	Rubber Tire Loaders	23	79	1	56.53160738	g/vehicle per day
2	2018	4	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.14546316	g/vehicle per day
2	2018	4	5	4	4013	2	Rubber Tire Loaders	23	100	1	43.84064268	g/vehicle per day
2	2018	5	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.72349151	g/vehicle per day
2	2018	5	5	4	4013	2	Rubber Tire Loaders	23	2	1	276.2620065	g/vehicle per day
2	2018	5	5	4	4013	2	Rubber Tire Loaders	23	3	1	685.8094524	g/vehicle per day
2	2018	5	5	4	4013	2	Rubber Tire Loaders	23	79	1	54.70799765	g/vehicle per day
2	2018	5	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.88271612	g/vehicle per day
2	2018	5	5	4	4013	2	Rubber Tire Loaders	23	100	1	42.4264161	g/vehicle per day
2	2018	6	5	4	4013	2	Rubber Tire Loaders	23	1	1	66.85713651	g/vehicle per day
2	2018	6	5	4	4013	2	Rubber Tire Loaders	23	2	1	309.2599945	g/vehicle per day
2	2018	6	5	4	4013	2	Rubber Tire Loaders	23	3	1	767.7257945	g/vehicle per day
2	2018	6	5	4	4013	2	Rubber Tire Loaders	23	79	1	61.24257718	g/vehicle per day
2	2018	6	5	4	4013	2	Rubber Tire Loaders	23	87	1	75.99095379	g/vehicle per day
2	2018	6	5	4	4013	2	Rubber Tire Loaders	23	100	1	47.49402218	g/vehicle per day
2	2018	7	5	4	4013	2	Rubber Tire Loaders	23	1	1	64.70043371	g/vehicle per day
2	2018	7	5	4	4013	2	Rubber Tire Loaders	23	2	1	299.283885	g/vehicle per day
2	2018	7	5	4	4013	2	Rubber Tire Loaders	23	3	1	742.9602824	g/vehicle per day
2	2018	7	5	4	4013	2	Rubber Tire Loaders	23	79	1	59.26699864	g/vehicle per day
2	2018	7	5	4	4013	2	Rubber Tire Loaders	23	87	1	73.53960306	g/vehicle per day
2	2018	7	5	4	4013	2	Rubber Tire Loaders	23	100	1	45.96196036	g/vehicle per day
2	2018	8	5	4	4013	2	Rubber Tire Loaders	23	1	1	64.70043371	g/vehicle per day
2	2018	8	5	4	4013	2	Rubber Tire Loaders	23	2	1	299.283885	g/vehicle per day
2	2018	8	5	4	4013	2	Rubber Tire Loaders	23	3	1	742.9602824	g/vehicle per day
2	2018	8	5	4	4013	2	Rubber Tire Loaders	23	79	1	59.26699864	g/vehicle per day
2	2018	8	5	4	4013	2	Rubber Tire Loaders	23	87	1	73.53960306	g/vehicle per day
2	2018	8	5	4	4013	2	Rubber Tire Loaders	23	100	1	45.96196036	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	9	5	4	4013	2	Rubber Tire Loaders	23	1	1	61.71426488	g/vehicle per day
2	2018	9	5	4	4013	2	Rubber Tire Loaders	23	2	1	285.470817	g/vehicle per day
2	2018	9	5	4	4013	2	Rubber Tire Loaders	23	3	1	708.6699442	g/vehicle per day
2	2018	9	5	4	4013	2	Rubber Tire Loaders	23	79	1	56.53160738	g/vehicle per day
2	2018	9	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.14546316	g/vehicle per day
2	2018	9	5	4	4013	2	Rubber Tire Loaders	23	100	1	43.84064268	g/vehicle per day
2	2018	10	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.72349151	g/vehicle per day
2	2018	10	5	4	4013	2	Rubber Tire Loaders	23	2	1	276.2620065	g/vehicle per day
2	2018	10	5	4	4013	2	Rubber Tire Loaders	23	3	1	685.8094524	g/vehicle per day
2	2018	10	5	4	4013	2	Rubber Tire Loaders	23	79	1	54.70799765	g/vehicle per day
2	2018	10	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.88271612	g/vehicle per day
2	2018	10	5	4	4013	2	Rubber Tire Loaders	23	100	1	42.4264161	g/vehicle per day
2	2018	11	5	4	4013	2	Rubber Tire Loaders	23	1	1	61.71426488	g/vehicle per day
2	2018	11	5	4	4013	2	Rubber Tire Loaders	23	2	1	285.470817	g/vehicle per day
2	2018	11	5	4	4013	2	Rubber Tire Loaders	23	3	1	708.6699442	g/vehicle per day
2	2018	11	5	4	4013	2	Rubber Tire Loaders	23	79	1	56.53160738	g/vehicle per day
2	2018	11	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.14546316	g/vehicle per day
2	2018	11	5	4	4013	2	Rubber Tire Loaders	23	100	1	43.84064268	g/vehicle per day
2	2018	12	5	4	4013	2	Rubber Tire Loaders	23	1	1	53.32454778	g/vehicle per day
2	2018	12	5	4	4013	2	Rubber Tire Loaders	23	2	1	246.662572	g/vehicle per day
2	2018	12	5	4	4013	2	Rubber Tire Loaders	23	3	1	612.3301013	g/vehicle per day
2	2018	12	5	4	4013	2	Rubber Tire Loaders	23	79	1	48.84643432	g/vehicle per day
2	2018	12	5	4	4013	2	Rubber Tire Loaders	23	87	1	60.60957626	g/vehicle per day
2	2018	12	5	4	4013	2	Rubber Tire Loaders	23	100	1	37.88073125	g/vehicle per day
2	2019	1	5	4	4013	2	Rubber Tire Loaders	23	1	1	51.01394223	g/vehicle per day
2	2019	1	5	4	4013	2	Rubber Tire Loaders	23	2	1	215.898064	g/vehicle per day
2	2019	1	5	4	4013	2	Rubber Tire Loaders	23	3	1	542.3978513	g/vehicle per day
2	2019	1	5	4	4013	2	Rubber Tire Loaders	23	79	1	46.5965208	g/vehicle per day
2	2019	1	5	4	4013	2	Rubber Tire Loaders	23	87	1	58.27759604	g/vehicle per day
2	2019	1	5	4	4013	2	Rubber Tire Loaders	23	100	1	32.57731662	g/vehicle per day
2	2019	2	5	4	4013	2	Rubber Tire Loaders	23	1	1	56.4797255	g/vehicle per day
2	2019	2	5	4	4013	2	Rubber Tire Loaders	23	2	1	239.0299701	g/vehicle per day
2	2019	2	5	4	4013	2	Rubber Tire Loaders	23	3	1	600.5118754	g/vehicle per day
2	2019	2	5	4	4013	2	Rubber Tire Loaders	23	79	1	51.58900205	g/vehicle per day
2	2019	2	5	4	4013	2	Rubber Tire Loaders	23	87	1	64.52161931	g/vehicle per day
2	2019	2	5	4	4013	2	Rubber Tire Loaders	23	100	1	36.06774981	g/vehicle per day
2	2019	3	5	4	4013	2	Rubber Tire Loaders	23	1	1	57.13559572	g/vehicle per day
2	2019	3	5	4	4013	2	Rubber Tire Loaders	23	2	1	241.8058078	g/vehicle per day
2	2019	3	5	4	4013	2	Rubber Tire Loaders	23	3	1	607.4854271	g/vehicle per day
2	2019	3	5	4	4013	2	Rubber Tire Loaders	23	79	1	52.1880783	g/vehicle per day
2	2019	3	5	4	4013	2	Rubber Tire Loaders	23	87	1	65.27086801	g/vehicle per day
2	2019	3	5	4	4013	2	Rubber Tire Loaders	23	100	1	36.48659616	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	4	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.04011774	g/vehicle per day
2	2019	4	5	4	4013	2	Rubber Tire Loaders	23	2	1	249.8659941	g/vehicle per day
2	2019	4	5	4	4013	2	Rubber Tire Loaders	23	3	1	627.7349915	g/vehicle per day
2	2019	4	5	4	4013	2	Rubber Tire Loaders	23	79	1	53.92768945	g/vehicle per day
2	2019	4	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.44656592	g/vehicle per day
2	2019	4	5	4	4013	2	Rubber Tire Loaders	23	100	1	37.70282422	g/vehicle per day
2	2019	5	5	4	4013	2	Rubber Tire Loaders	23	1	1	57.13559572	g/vehicle per day
2	2019	5	5	4	4013	2	Rubber Tire Loaders	23	2	1	241.8058078	g/vehicle per day
2	2019	5	5	4	4013	2	Rubber Tire Loaders	23	3	1	607.4854271	g/vehicle per day
2	2019	5	5	4	4013	2	Rubber Tire Loaders	23	79	1	52.1880783	g/vehicle per day
2	2019	5	5	4	4013	2	Rubber Tire Loaders	23	87	1	65.27086801	g/vehicle per day
2	2019	5	5	4	4013	2	Rubber Tire Loaders	23	100	1	36.48659616	g/vehicle per day
2	2019	6	5	4	4013	2	Rubber Tire Loaders	23	1	1	63.9601447	g/vehicle per day
2	2019	6	5	4	4013	2	Rubber Tire Loaders	23	2	1	270.6880676	g/vehicle per day
2	2019	6	5	4	4013	2	Rubber Tire Loaders	23	3	1	680.0463204	g/vehicle per day
2	2019	6	5	4	4013	2	Rubber Tire Loaders	23	79	1	58.42166463	g/vehicle per day
2	2019	6	5	4	4013	2	Rubber Tire Loaders	23	87	1	73.06714993	g/vehicle per day
2	2019	6	5	4	4013	2	Rubber Tire Loaders	23	100	1	40.84471508	g/vehicle per day
2	2019	7	5	4	4013	2	Rubber Tire Loaders	23	1	1	61.89690603	g/vehicle per day
2	2019	7	5	4	4013	2	Rubber Tire Loaders	23	2	1	261.9562433	g/vehicle per day
2	2019	7	5	4	4013	2	Rubber Tire Loaders	23	3	1	658.1091655	g/vehicle per day
2	2019	7	5	4	4013	2	Rubber Tire Loaders	23	79	1	56.53709698	g/vehicle per day
2	2019	7	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.71011736	g/vehicle per day
2	2019	7	5	4	4013	2	Rubber Tire Loaders	23	100	1	39.52715472	g/vehicle per day
2	2019	8	5	4	4013	2	Rubber Tire Loaders	23	1	1	61.89690603	g/vehicle per day
2	2019	8	5	4	4013	2	Rubber Tire Loaders	23	2	1	261.9562433	g/vehicle per day
2	2019	8	5	4	4013	2	Rubber Tire Loaders	23	3	1	658.1091655	g/vehicle per day
2	2019	8	5	4	4013	2	Rubber Tire Loaders	23	79	1	56.53709698	g/vehicle per day
2	2019	8	5	4	4013	2	Rubber Tire Loaders	23	87	1	70.71011736	g/vehicle per day
2	2019	8	5	4	4013	2	Rubber Tire Loaders	23	100	1	39.52715472	g/vehicle per day
2	2019	9	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.04011774	g/vehicle per day
2	2019	9	5	4	4013	2	Rubber Tire Loaders	23	2	1	249.8659941	g/vehicle per day
2	2019	9	5	4	4013	2	Rubber Tire Loaders	23	3	1	627.7349915	g/vehicle per day
2	2019	9	5	4	4013	2	Rubber Tire Loaders	23	79	1	53.92768945	g/vehicle per day
2	2019	9	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.44656592	g/vehicle per day
2	2019	9	5	4	4013	2	Rubber Tire Loaders	23	100	1	37.70282422	g/vehicle per day
2	2019	10	5	4	4013	2	Rubber Tire Loaders	23	1	1	57.13559572	g/vehicle per day
2	2019	10	5	4	4013	2	Rubber Tire Loaders	23	2	1	241.8058078	g/vehicle per day
2	2019	10	5	4	4013	2	Rubber Tire Loaders	23	3	1	607.4854271	g/vehicle per day
2	2019	10	5	4	4013	2	Rubber Tire Loaders	23	79	1	52.1880783	g/vehicle per day
2	2019	10	5	4	4013	2	Rubber Tire Loaders	23	87	1	65.27086801	g/vehicle per day
2	2019	10	5	4	4013	2	Rubber Tire Loaders	23	100	1	36.48659616	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	11	5	4	4013	2	Rubber Tire Loaders	23	1	1	59.04011774	g/vehicle per day
2	2019	11	5	4	4013	2	Rubber Tire Loaders	23	2	1	249.8659941	g/vehicle per day
2	2019	11	5	4	4013	2	Rubber Tire Loaders	23	3	1	627.7349915	g/vehicle per day
2	2019	11	5	4	4013	2	Rubber Tire Loaders	23	79	1	53.92768945	g/vehicle per day
2	2019	11	5	4	4013	2	Rubber Tire Loaders	23	87	1	67.44656592	g/vehicle per day
2	2019	11	5	4	4013	2	Rubber Tire Loaders	23	100	1	37.70282422	g/vehicle per day
2	2019	12	5	4	4013	2	Rubber Tire Loaders	23	1	1	51.01394223	g/vehicle per day
2	2019	12	5	4	4013	2	Rubber Tire Loaders	23	2	1	215.898064	g/vehicle per day
2	2019	12	5	4	4013	2	Rubber Tire Loaders	23	3	1	542.3978513	g/vehicle per day
2	2019	12	5	4	4013	2	Rubber Tire Loaders	23	79	1	46.5965208	g/vehicle per day
2	2019	12	5	4	4013	2	Rubber Tire Loaders	23	87	1	58.27759604	g/vehicle per day
2	2019	12	5	4	4013	2	Rubber Tire Loaders	23	100	1	32.57731662	g/vehicle per day
2	2017	1	5	4	4013	2	Scrapers	23	1	1	96.95204574	g/vehicle per day
2	2017	1	5	4	4013	2	Scrapers	23	2	1	530.0367189	g/vehicle per day
2	2017	1	5	4	4013	2	Scrapers	23	3	1	1146.797814	g/vehicle per day
2	2017	1	5	4	4013	2	Scrapers	23	79	1	88.2064235	g/vehicle per day
2	2017	1	5	4	4013	2	Scrapers	23	87	1	110.5959819	g/vehicle per day
2	2017	1	5	4	4013	2	Scrapers	23	100	1	68.73753433	g/vehicle per day
2	2017	2	5	4	4013	2	Scrapers	23	1	1	107.3397922	g/vehicle per day
2	2017	2	5	4	4013	2	Scrapers	23	2	1	586.8261388	g/vehicle per day
2	2017	2	5	4	4013	2	Scrapers	23	3	1	1269.668767	g/vehicle per day
2	2017	2	5	4	4013	2	Scrapers	23	79	1	97.65716809	g/vehicle per day
2	2017	2	5	4	4013	2	Scrapers	23	87	1	122.4455019	g/vehicle per day
2	2017	2	5	4	4013	2	Scrapers	23	100	1	76.10232594	g/vehicle per day
2	2017	3	5	4	4013	2	Scrapers	23	1	1	108.5861745	g/vehicle per day
2	2017	3	5	4	4013	2	Scrapers	23	2	1	593.6408486	g/vehicle per day
2	2017	3	5	4	4013	2	Scrapers	23	3	1	1284.41261	g/vehicle per day
2	2017	3	5	4	4013	2	Scrapers	23	79	1	98.7910851	g/vehicle per day
2	2017	3	5	4	4013	2	Scrapers	23	87	1	123.867358	g/vehicle per day
2	2017	3	5	4	4013	2	Scrapers	23	100	1	76.98609191	g/vehicle per day
2	2017	4	5	4	4013	2	Scrapers	23	1	1	112.2057318	g/vehicle per day
2	2017	4	5	4	4013	2	Scrapers	23	2	1	613.4290049	g/vehicle per day
2	2017	4	5	4	4013	2	Scrapers	23	3	1	1327.227099	g/vehicle per day
2	2017	4	5	4	4013	2	Scrapers	23	79	1	102.0841686	g/vehicle per day
2	2017	4	5	4	4013	2	Scrapers	23	87	1	127.9962527	g/vehicle per day
2	2017	4	5	4	4013	2	Scrapers	23	100	1	79.55225683	g/vehicle per day
2	2017	5	5	4	4013	2	Scrapers	23	1	1	108.5861745	g/vehicle per day
2	2017	5	5	4	4013	2	Scrapers	23	2	1	593.6408486	g/vehicle per day
2	2017	5	5	4	4013	2	Scrapers	23	3	1	1284.41261	g/vehicle per day
2	2017	5	5	4	4013	2	Scrapers	23	79	1	98.7910851	g/vehicle per day
2	2017	5	5	4	4013	2	Scrapers	23	87	1	123.867358	g/vehicle per day
2	2017	5	5	4	4013	2	Scrapers	23	100	1	76.98609191	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2017	6	5	4	4013	2	Scrapers	23	1	1	121.556225	g/vehicle per day
2	2017	6	5	4	4013	2	Scrapers	23	2	1	664.54762	g/vehicle per day
2	2017	6	5	4	4013	2	Scrapers	23	3	1	1437.828742	g/vehicle per day
2	2017	6	5	4	4013	2	Scrapers	23	79	1	110.5911755	g/vehicle per day
2	2017	6	5	4	4013	2	Scrapers	23	87	1	138.6626561	g/vehicle per day
2	2017	6	5	4	4013	2	Scrapers	23	100	1	86.18161132	g/vehicle per day
2	2017	7	5	4	4013	2	Scrapers	23	1	1	117.6350787	g/vehicle per day
2	2017	7	5	4	4013	2	Scrapers	23	2	1	643.1109758	g/vehicle per day
2	2017	7	5	4	4013	2	Scrapers	23	3	1	1391.447567	g/vehicle per day
2	2017	7	5	4	4013	2	Scrapers	23	79	1	107.023744	g/vehicle per day
2	2017	7	5	4	4013	2	Scrapers	23	87	1	134.189638	g/vehicle per day
2	2017	7	5	4	4013	2	Scrapers	23	100	1	83.40155359	g/vehicle per day
2	2017	8	5	4	4013	2	Scrapers	23	1	1	117.6350787	g/vehicle per day
2	2017	8	5	4	4013	2	Scrapers	23	2	1	643.1109758	g/vehicle per day
2	2017	8	5	4	4013	2	Scrapers	23	3	1	1391.447567	g/vehicle per day
2	2017	8	5	4	4013	2	Scrapers	23	79	1	107.023744	g/vehicle per day
2	2017	8	5	4	4013	2	Scrapers	23	87	1	134.189638	g/vehicle per day
2	2017	8	5	4	4013	2	Scrapers	23	100	1	83.40155359	g/vehicle per day
2	2017	9	5	4	4013	2	Scrapers	23	1	1	112.2057318	g/vehicle per day
2	2017	9	5	4	4013	2	Scrapers	23	2	1	613.4290049	g/vehicle per day
2	2017	9	5	4	4013	2	Scrapers	23	3	1	1327.227099	g/vehicle per day
2	2017	9	5	4	4013	2	Scrapers	23	79	1	102.0841686	g/vehicle per day
2	2017	9	5	4	4013	2	Scrapers	23	87	1	127.9962527	g/vehicle per day
2	2017	9	5	4	4013	2	Scrapers	23	100	1	79.55225683	g/vehicle per day
2	2017	10	5	4	4013	2	Scrapers	23	1	1	108.5861745	g/vehicle per day
2	2017	10	5	4	4013	2	Scrapers	23	2	1	593.6408486	g/vehicle per day
2	2017	10	5	4	4013	2	Scrapers	23	3	1	1284.41261	g/vehicle per day
2	2017	10	5	4	4013	2	Scrapers	23	79	1	98.7910851	g/vehicle per day
2	2017	10	5	4	4013	2	Scrapers	23	87	1	123.867358	g/vehicle per day
2	2017	10	5	4	4013	2	Scrapers	23	100	1	76.98609191	g/vehicle per day
2	2017	11	5	4	4013	2	Scrapers	23	1	1	112.2057318	g/vehicle per day
2	2017	11	5	4	4013	2	Scrapers	23	2	1	613.4290049	g/vehicle per day
2	2017	11	5	4	4013	2	Scrapers	23	3	1	1327.227099	g/vehicle per day
2	2017	11	5	4	4013	2	Scrapers	23	79	1	102.0841686	g/vehicle per day
2	2017	11	5	4	4013	2	Scrapers	23	87	1	127.9962527	g/vehicle per day
2	2017	11	5	4	4013	2	Scrapers	23	100	1	79.55225683	g/vehicle per day
2	2017	12	5	4	4013	2	Scrapers	23	1	1	96.95204574	g/vehicle per day
2	2017	12	5	4	4013	2	Scrapers	23	2	1	530.0367189	g/vehicle per day
2	2017	12	5	4	4013	2	Scrapers	23	3	1	1146.797814	g/vehicle per day
2	2017	12	5	4	4013	2	Scrapers	23	79	1	88.2064235	g/vehicle per day
2	2017	12	5	4	4013	2	Scrapers	23	87	1	110.5959819	g/vehicle per day
2	2017	12	5	4	4013	2	Scrapers	23	100	1	68.73753433	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	1	5	4	4013	2	Scrapers	23	1	1	93.73134339	g/vehicle per day
1	2018	1	5	4	4013	2	Scrapers	23	2	1	461.3234438	g/vehicle per day
1	2018	1	5	4	4013	2	Scrapers	23	3	1	985.4440613	g/vehicle per day
1	2018	1	5	4	4013	2	Scrapers	23	79	1	85.08329959	g/vehicle per day
1	2018	1	5	4	4013	2	Scrapers	23	87	1	107.4892168	g/vehicle per day
1	2018	1	5	4	4013	2	Scrapers	23	100	1	59.57904857	g/vehicle per day
1	2018	2	5	4	4013	2	Scrapers	23	1	1	103.7740078	g/vehicle per day
1	2018	2	5	4	4013	2	Scrapers	23	2	1	510.7507921	g/vehicle per day
1	2018	2	5	4	4013	2	Scrapers	23	3	1	1091.027631	g/vehicle per day
1	2018	2	5	4	4013	2	Scrapers	23	79	1	94.19929998	g/vehicle per day
1	2018	2	5	4	4013	2	Scrapers	23	87	1	119.0058911	g/vehicle per day
1	2018	2	5	4	4013	2	Scrapers	23	100	1	65.96254665	g/vehicle per day
1	2018	3	5	4	4013	2	Scrapers	23	1	1	104.9791055	g/vehicle per day
1	2018	3	5	4	4013	2	Scrapers	23	2	1	516.6818072	g/vehicle per day
1	2018	3	5	4	4013	2	Scrapers	23	3	1	1103.697314	g/vehicle per day
1	2018	3	5	4	4013	2	Scrapers	23	79	1	95.29321114	g/vehicle per day
1	2018	3	5	4	4013	2	Scrapers	23	87	1	120.3879402	g/vehicle per day
1	2018	3	5	4	4013	2	Scrapers	23	100	1	66.72849854	g/vehicle per day
1	2018	4	5	4	4013	2	Scrapers	23	1	1	108.4783891	g/vehicle per day
1	2018	4	5	4	4013	2	Scrapers	23	2	1	533.9045696	g/vehicle per day
1	2018	4	5	4	4013	2	Scrapers	23	3	1	1140.487277	g/vehicle per day
1	2018	4	5	4	4013	2	Scrapers	23	79	1	98.46962037	g/vehicle per day
1	2018	4	5	4	4013	2	Scrapers	23	87	1	124.4007953	g/vehicle per day
1	2018	4	5	4	4013	2	Scrapers	23	100	1	68.95279287	g/vehicle per day
1	2018	5	5	4	4013	2	Scrapers	23	1	1	104.9791055	g/vehicle per day
1	2018	5	5	4	4013	2	Scrapers	23	2	1	516.6818072	g/vehicle per day
1	2018	5	5	4	4013	2	Scrapers	23	3	1	1103.697314	g/vehicle per day
1	2018	5	5	4	4013	2	Scrapers	23	79	1	95.29321114	g/vehicle per day
1	2018	5	5	4	4013	2	Scrapers	23	87	1	120.3879402	g/vehicle per day
1	2018	5	5	4	4013	2	Scrapers	23	100	1	66.72849854	g/vehicle per day
1	2018	6	5	4	4013	2	Scrapers	23	1	1	117.5182941	g/vehicle per day
1	2018	6	5	4	4013	2	Scrapers	23	2	1	578.3970987	g/vehicle per day
1	2018	6	5	4	4013	2	Scrapers	23	3	1	1235.527764	g/vehicle per day
1	2018	6	5	4	4013	2	Scrapers	23	79	1	106.6754882	g/vehicle per day
1	2018	6	5	4	4013	2	Scrapers	23	87	1	134.7676136	g/vehicle per day
1	2018	6	5	4	4013	2	Scrapers	23	100	1	74.69889456	g/vehicle per day
1	2018	7	5	4	4013	2	Scrapers	23	1	1	113.7273853	g/vehicle per day
1	2018	7	5	4	4013	2	Scrapers	23	2	1	559.7388646	g/vehicle per day
1	2018	7	5	4	4013	2	Scrapers	23	3	1	1195.672365	g/vehicle per day
1	2018	7	5	4	4013	2	Scrapers	23	79	1	103.2343491	g/vehicle per day
1	2018	7	5	4	4013	2	Scrapers	23	87	1	130.4202774	g/vehicle per day
1	2018	7	5	4	4013	2	Scrapers	23	100	1	72.2892704	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
1	2018	8	5	4	4013	2	Scrapers	23	1	1	113.7273853	g/vehicle per day
1	2018	8	5	4	4013	2	Scrapers	23	2	1	559.7388646	g/vehicle per day
1	2018	8	5	4	4013	2	Scrapers	23	3	1	1195.672365	g/vehicle per day
1	2018	8	5	4	4013	2	Scrapers	23	79	1	103.2343491	g/vehicle per day
1	2018	8	5	4	4013	2	Scrapers	23	87	1	130.4202774	g/vehicle per day
1	2018	8	5	4	4013	2	Scrapers	23	100	1	72.2892704	g/vehicle per day
1	2018	9	5	4	4013	2	Scrapers	23	1	1	108.4783891	g/vehicle per day
1	2018	9	5	4	4013	2	Scrapers	23	2	1	533.9045696	g/vehicle per day
1	2018	9	5	4	4013	2	Scrapers	23	3	1	1140.487277	g/vehicle per day
1	2018	9	5	4	4013	2	Scrapers	23	79	1	98.46962037	g/vehicle per day
1	2018	9	5	4	4013	2	Scrapers	23	87	1	124.4007953	g/vehicle per day
1	2018	9	5	4	4013	2	Scrapers	23	100	1	68.95279287	g/vehicle per day
1	2018	10	5	4	4013	2	Scrapers	23	1	1	104.9791055	g/vehicle per day
1	2018	10	5	4	4013	2	Scrapers	23	2	1	516.6818072	g/vehicle per day
1	2018	10	5	4	4013	2	Scrapers	23	3	1	1103.697314	g/vehicle per day
1	2018	10	5	4	4013	2	Scrapers	23	79	1	95.29321114	g/vehicle per day
1	2018	10	5	4	4013	2	Scrapers	23	87	1	120.3879402	g/vehicle per day
1	2018	10	5	4	4013	2	Scrapers	23	100	1	66.72849854	g/vehicle per day
1	2018	11	5	4	4013	2	Scrapers	23	1	1	108.4783891	g/vehicle per day
1	2018	11	5	4	4013	2	Scrapers	23	2	1	533.9045696	g/vehicle per day
1	2018	11	5	4	4013	2	Scrapers	23	3	1	1140.487277	g/vehicle per day
1	2018	11	5	4	4013	2	Scrapers	23	79	1	98.46962037	g/vehicle per day
1	2018	11	5	4	4013	2	Scrapers	23	87	1	124.4007953	g/vehicle per day
1	2018	11	5	4	4013	2	Scrapers	23	100	1	68.95279287	g/vehicle per day
1	2018	12	5	4	4013	2	Scrapers	23	1	1	93.73134339	g/vehicle per day
1	2018	12	5	4	4013	2	Scrapers	23	2	1	461.3234438	g/vehicle per day
1	2018	12	5	4	4013	2	Scrapers	23	3	1	985.4440613	g/vehicle per day
1	2018	12	5	4	4013	2	Scrapers	23	79	1	85.08329959	g/vehicle per day
1	2018	12	5	4	4013	2	Scrapers	23	87	1	107.4892168	g/vehicle per day
1	2018	12	5	4	4013	2	Scrapers	23	100	1	59.57904857	g/vehicle per day
2	2018	1	5	4	4013	2	Scrapers	23	1	1	93.73134339	g/vehicle per day
2	2018	1	5	4	4013	2	Scrapers	23	2	1	461.3234438	g/vehicle per day
2	2018	1	5	4	4013	2	Scrapers	23	3	1	985.4440613	g/vehicle per day
2	2018	1	5	4	4013	2	Scrapers	23	79	1	85.08329959	g/vehicle per day
2	2018	1	5	4	4013	2	Scrapers	23	87	1	107.4892168	g/vehicle per day
2	2018	1	5	4	4013	2	Scrapers	23	100	1	59.57904857	g/vehicle per day
2	2018	2	5	4	4013	2	Scrapers	23	1	1	103.7740078	g/vehicle per day
2	2018	2	5	4	4013	2	Scrapers	23	2	1	510.7507921	g/vehicle per day
2	2018	2	5	4	4013	2	Scrapers	23	3	1	1091.027631	g/vehicle per day
2	2018	2	5	4	4013	2	Scrapers	23	79	1	94.19929998	g/vehicle per day
2	2018	2	5	4	4013	2	Scrapers	23	87	1	119.0058911	g/vehicle per day
2	2018	2	5	4	4013	2	Scrapers	23	100	1	65.96254665	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	3	5	4	4013	2	Scrapers	23	1	1	104.9791055	g/vehicle per day
2	2018	3	5	4	4013	2	Scrapers	23	2	1	516.6818072	g/vehicle per day
2	2018	3	5	4	4013	2	Scrapers	23	3	1	1103.697314	g/vehicle per day
2	2018	3	5	4	4013	2	Scrapers	23	79	1	95.29321114	g/vehicle per day
2	2018	3	5	4	4013	2	Scrapers	23	87	1	120.3879402	g/vehicle per day
2	2018	3	5	4	4013	2	Scrapers	23	100	1	66.72849854	g/vehicle per day
2	2018	4	5	4	4013	2	Scrapers	23	1	1	108.4783891	g/vehicle per day
2	2018	4	5	4	4013	2	Scrapers	23	2	1	533.9045696	g/vehicle per day
2	2018	4	5	4	4013	2	Scrapers	23	3	1	1140.487277	g/vehicle per day
2	2018	4	5	4	4013	2	Scrapers	23	79	1	98.46962037	g/vehicle per day
2	2018	4	5	4	4013	2	Scrapers	23	87	1	124.4007953	g/vehicle per day
2	2018	4	5	4	4013	2	Scrapers	23	100	1	68.95279287	g/vehicle per day
2	2018	5	5	4	4013	2	Scrapers	23	1	1	104.9791055	g/vehicle per day
2	2018	5	5	4	4013	2	Scrapers	23	2	1	516.6818072	g/vehicle per day
2	2018	5	5	4	4013	2	Scrapers	23	3	1	1103.697314	g/vehicle per day
2	2018	5	5	4	4013	2	Scrapers	23	79	1	95.29321114	g/vehicle per day
2	2018	5	5	4	4013	2	Scrapers	23	87	1	120.3879402	g/vehicle per day
2	2018	5	5	4	4013	2	Scrapers	23	100	1	66.72849854	g/vehicle per day
2	2018	6	5	4	4013	2	Scrapers	23	1	1	117.5182941	g/vehicle per day
2	2018	6	5	4	4013	2	Scrapers	23	2	1	578.3970987	g/vehicle per day
2	2018	6	5	4	4013	2	Scrapers	23	3	1	1235.527764	g/vehicle per day
2	2018	6	5	4	4013	2	Scrapers	23	79	1	106.6754882	g/vehicle per day
2	2018	6	5	4	4013	2	Scrapers	23	87	1	134.7676136	g/vehicle per day
2	2018	6	5	4	4013	2	Scrapers	23	100	1	74.69889456	g/vehicle per day
2	2018	7	5	4	4013	2	Scrapers	23	1	1	113.7273853	g/vehicle per day
2	2018	7	5	4	4013	2	Scrapers	23	2	1	559.7388646	g/vehicle per day
2	2018	7	5	4	4013	2	Scrapers	23	3	1	1195.672365	g/vehicle per day
2	2018	7	5	4	4013	2	Scrapers	23	79	1	103.2343491	g/vehicle per day
2	2018	7	5	4	4013	2	Scrapers	23	87	1	130.4202774	g/vehicle per day
2	2018	7	5	4	4013	2	Scrapers	23	100	1	72.2892704	g/vehicle per day
2	2018	8	5	4	4013	2	Scrapers	23	1	1	113.7273853	g/vehicle per day
2	2018	8	5	4	4013	2	Scrapers	23	2	1	559.7388646	g/vehicle per day
2	2018	8	5	4	4013	2	Scrapers	23	3	1	1195.672365	g/vehicle per day
2	2018	8	5	4	4013	2	Scrapers	23	79	1	103.2343491	g/vehicle per day
2	2018	8	5	4	4013	2	Scrapers	23	87	1	130.4202774	g/vehicle per day
2	2018	8	5	4	4013	2	Scrapers	23	100	1	72.2892704	g/vehicle per day
2	2018	9	5	4	4013	2	Scrapers	23	1	1	108.4783891	g/vehicle per day
2	2018	9	5	4	4013	2	Scrapers	23	2	1	533.9045696	g/vehicle per day
2	2018	9	5	4	4013	2	Scrapers	23	3	1	1140.487277	g/vehicle per day
2	2018	9	5	4	4013	2	Scrapers	23	79	1	98.46962037	g/vehicle per day
2	2018	9	5	4	4013	2	Scrapers	23	87	1	124.4007953	g/vehicle per day
2	2018	9	5	4	4013	2	Scrapers	23	100	1	68.95279287	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2018	10	5	4	4013	2	Scrapers	23	1	1	104.9791055	g/vehicle per day
2	2018	10	5	4	4013	2	Scrapers	23	2	1	516.6818072	g/vehicle per day
2	2018	10	5	4	4013	2	Scrapers	23	3	1	1103.697314	g/vehicle per day
2	2018	10	5	4	4013	2	Scrapers	23	79	1	95.29321114	g/vehicle per day
2	2018	10	5	4	4013	2	Scrapers	23	87	1	120.3879402	g/vehicle per day
2	2018	10	5	4	4013	2	Scrapers	23	100	1	66.72849854	g/vehicle per day
2	2018	11	5	4	4013	2	Scrapers	23	1	1	108.4783891	g/vehicle per day
2	2018	11	5	4	4013	2	Scrapers	23	2	1	533.9045696	g/vehicle per day
2	2018	11	5	4	4013	2	Scrapers	23	3	1	1140.487277	g/vehicle per day
2	2018	11	5	4	4013	2	Scrapers	23	79	1	98.46962037	g/vehicle per day
2	2018	11	5	4	4013	2	Scrapers	23	87	1	124.4007953	g/vehicle per day
2	2018	11	5	4	4013	2	Scrapers	23	100	1	68.95279287	g/vehicle per day
2	2018	12	5	4	4013	2	Scrapers	23	1	1	93.73134339	g/vehicle per day
2	2018	12	5	4	4013	2	Scrapers	23	2	1	461.3234438	g/vehicle per day
2	2018	12	5	4	4013	2	Scrapers	23	3	1	985.4440613	g/vehicle per day
2	2018	12	5	4	4013	2	Scrapers	23	79	1	85.08329959	g/vehicle per day
2	2018	12	5	4	4013	2	Scrapers	23	87	1	107.4892168	g/vehicle per day
2	2018	12	5	4	4013	2	Scrapers	23	100	1	59.57904857	g/vehicle per day
2	2019	1	5	4	4013	2	Scrapers	23	1	1	90.96020615	g/vehicle per day
2	2019	1	5	4	4013	2	Scrapers	23	2	1	396.5404874	g/vehicle per day
2	2019	1	5	4	4013	2	Scrapers	23	3	1	845.3176692	g/vehicle per day
2	2019	1	5	4	4013	2	Scrapers	23	79	1	82.41161773	g/vehicle per day
2	2019	1	5	4	4013	2	Scrapers	23	87	1	104.8369605	g/vehicle per day
2	2019	1	5	4	4013	2	Scrapers	23	100	1	50.26281692	g/vehicle per day
2	2019	2	5	4	4013	2	Scrapers	23	1	1	100.7058874	g/vehicle per day
2	2019	2	5	4	4013	2	Scrapers	23	2	1	439.0265678	g/vehicle per day
2	2019	2	5	4	4013	2	Scrapers	23	3	1	935.8877412	g/vehicle per day
2	2019	2	5	4	4013	2	Scrapers	23	79	1	91.24133353	g/vehicle per day
2	2019	2	5	4	4013	2	Scrapers	23	87	1	116.0694138	g/vehicle per day
2	2019	2	5	4	4013	2	Scrapers	23	100	1	55.6481233	g/vehicle per day
2	2019	3	5	4	4013	2	Scrapers	23	1	1	101.8754266	g/vehicle per day
2	2019	3	5	4	4013	2	Scrapers	23	2	1	444.1249485	g/vehicle per day
2	2019	3	5	4	4013	2	Scrapers	23	3	1	946.7557441	g/vehicle per day
2	2019	3	5	4	4013	2	Scrapers	23	79	1	92.30095091	g/vehicle per day
2	2019	3	5	4	4013	2	Scrapers	23	87	1	117.4173542	g/vehicle per day
2	2019	3	5	4	4013	2	Scrapers	23	100	1	56.29434804	g/vehicle per day
2	2019	4	5	4	4013	2	Scrapers	23	1	1	105.2712146	g/vehicle per day
2	2019	4	5	4	4013	2	Scrapers	23	2	1	458.9293178	g/vehicle per day
2	2019	4	5	4	4013	2	Scrapers	23	3	1	978.3144849	g/vehicle per day
2	2019	4	5	4	4013	2	Scrapers	23	79	1	95.37759571	g/vehicle per day
2	2019	4	5	4	4013	2	Scrapers	23	87	1	121.3312223	g/vehicle per day
2	2019	4	5	4	4013	2	Scrapers	23	100	1	58.17084922	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	5	5	4	4013	2	Scrapers	23	1	1	101.8754266	g/vehicle per day
2	2019	5	5	4	4013	2	Scrapers	23	2	1	444.1249485	g/vehicle per day
2	2019	5	5	4	4013	2	Scrapers	23	3	1	946.7557441	g/vehicle per day
2	2019	5	5	4	4013	2	Scrapers	23	79	1	92.30095091	g/vehicle per day
2	2019	5	5	4	4013	2	Scrapers	23	87	1	117.4173542	g/vehicle per day
2	2019	5	5	4	4013	2	Scrapers	23	100	1	56.29434804	g/vehicle per day
2	2019	6	5	4	4013	2	Scrapers	23	1	1	114.0439022	g/vehicle per day
2	2019	6	5	4	4013	2	Scrapers	23	2	1	497.1730628	g/vehicle per day
2	2019	6	5	4	4013	2	Scrapers	23	3	1	1059.840453	g/vehicle per day
2	2019	6	5	4	4013	2	Scrapers	23	79	1	103.3258013	g/vehicle per day
2	2019	6	5	4	4013	2	Scrapers	23	87	1	131.4422523	g/vehicle per day
2	2019	6	5	4	4013	2	Scrapers	23	100	1	63.0183961	g/vehicle per day
2	2019	7	5	4	4013	2	Scrapers	23	1	1	110.3650498	g/vehicle per day
2	2019	7	5	4	4013	2	Scrapers	23	2	1	481.1354208	g/vehicle per day
2	2019	7	5	4	4013	2	Scrapers	23	3	1	1025.652317	g/vehicle per day
2	2019	7	5	4	4013	2	Scrapers	23	79	1	99.99271338	g/vehicle per day
2	2019	7	5	4	4013	2	Scrapers	23	87	1	127.2021303	g/vehicle per day
2	2019	7	5	4	4013	2	Scrapers	23	100	1	60.98555248	g/vehicle per day
2	2019	8	5	4	4013	2	Scrapers	23	1	1	110.3650498	g/vehicle per day
2	2019	8	5	4	4013	2	Scrapers	23	2	1	481.1354208	g/vehicle per day
2	2019	8	5	4	4013	2	Scrapers	23	3	1	1025.652317	g/vehicle per day
2	2019	8	5	4	4013	2	Scrapers	23	79	1	99.99271338	g/vehicle per day
2	2019	8	5	4	4013	2	Scrapers	23	87	1	127.2021303	g/vehicle per day
2	2019	8	5	4	4013	2	Scrapers	23	100	1	60.98555248	g/vehicle per day
2	2019	9	5	4	4013	2	Scrapers	23	1	1	105.2712146	g/vehicle per day
2	2019	9	5	4	4013	2	Scrapers	23	2	1	458.9293178	g/vehicle per day
2	2019	9	5	4	4013	2	Scrapers	23	3	1	978.3144849	g/vehicle per day
2	2019	9	5	4	4013	2	Scrapers	23	79	1	95.37759571	g/vehicle per day
2	2019	9	5	4	4013	2	Scrapers	23	87	1	121.3312223	g/vehicle per day
2	2019	9	5	4	4013	2	Scrapers	23	100	1	58.17084922	g/vehicle per day
2	2019	10	5	4	4013	2	Scrapers	23	1	1	101.8754266	g/vehicle per day
2	2019	10	5	4	4013	2	Scrapers	23	2	1	444.1249485	g/vehicle per day
2	2019	10	5	4	4013	2	Scrapers	23	3	1	946.7557441	g/vehicle per day
2	2019	10	5	4	4013	2	Scrapers	23	79	1	92.30095091	g/vehicle per day
2	2019	10	5	4	4013	2	Scrapers	23	87	1	117.4173542	g/vehicle per day
2	2019	10	5	4	4013	2	Scrapers	23	100	1	56.29434804	g/vehicle per day
2	2019	11	5	4	4013	2	Scrapers	23	1	1	105.2712146	g/vehicle per day
2	2019	11	5	4	4013	2	Scrapers	23	2	1	458.9293178	g/vehicle per day
2	2019	11	5	4	4013	2	Scrapers	23	3	1	978.3144849	g/vehicle per day
2	2019	11	5	4	4013	2	Scrapers	23	79	1	95.37759571	g/vehicle per day
2	2019	11	5	4	4013	2	Scrapers	23	87	1	121.3312223	g/vehicle per day
2	2019	11	5	4	4013	2	Scrapers	23	100	1	58.17084922	g/vehicle per day

fuelType ID
23: Nonroad Diesel Fuel

MOVES2014a Emission Factors for Construction Equipment

MOVESRunID	yearID	monthID	dayID	stateID	countyID	sectorID	description	fuelTypeID	pollutantID	processID	emissionRate	emissionRateUnits
2	2019	12	5	4	4013	2	Scrapers	23	1	1	90.96020615	g/vehicle per day
2	2019	12	5	4	4013	2	Scrapers	23	2	1	396.5404874	g/vehicle per day
2	2019	12	5	4	4013	2	Scrapers	23	3	1	845.3176692	g/vehicle per day
2	2019	12	5	4	4013	2	Scrapers	23	79	1	82.41161773	g/vehicle per day
2	2019	12	5	4	4013	2	Scrapers	23	87	1	104.8369605	g/vehicle per day
2	2019	12	5	4	4013	2	Scrapers	23	100	1	50.26281692	g/vehicle per day

APPENDIX C

Construction Pollutants Emissions in the Geographic Jurisdiction

SMF Construction Pollutants Emissions (tons/year) in the waters of the US

	CO	PM10 Exhaust	PM10 Fugitive	PM10 Total (F+E)	NOx	VOC
47 small drainages	5.60	0.67	1.63	2.30	20.15	2.23
LACC	0.18	0.02	0.34	0.36	0.59	0.07
Salt River	1.43	0.18	15.57	15.75	4.40	0.48
Total	7.21	0.88	17.54	18.42	25.14	2.78
De Minimis Rate	100	70	70	70	100	100
Equal/Exceeds	No	No	No	No	No	No

Note:

For worst case scenario, construction emissions are assumed to occur solely in year 2018.

Emission Calculations for each small Drainage - CO

Construction Start Year 2018
 Construction Time approx. 1.5 month

Working Days per Month 22 days

Number of Equipment
 (Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane			1	
Excavator			1	
Grader		1		
Off-Highway Truck		3		
Paver				1
Paving Equipment				1
Pile Driver				
Plate Compactor			1	
Roller		1		3
Rubber Tired Dozer	1			
Rubber Tired Loader	1		1	1
Scraper				
Signal Board				
Trencher				
Dumper	1			4
Forklift			1	
Water Truck	1	1	1	1

Notes:

The grubbing/Land Clearing phase is estimated to be 1 week (5 days)

The grading phase is estimated to be 3 weeks (15 days)

The Drainage phase is estimated to be 2 weeks (10 days)

The paving phase is estimated to be 2 days

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	0	1726.385599	0
Excavator	0	0	1640.634572	0
Grader	0	2529.451973	0	0
Off-Highway Truck	0	58701.64766	0	0
Paver	0	0	0	304.4181228
Paving Equipment	0	0	0	205.917561
Pile Driver	0	0	0	0
Plate Compactor	0	0	208.8591418	0
Roller	0	2104.7939	0	841.9175598
Rubber Tired Dozer	1719.522819	0	0	0
Rubber Tired Loader	1546.299973	0	3092.599945	618.519989
Scraper	0	0	0	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	326.9225603	0	0	523.0760964
Forklift	0	0	1305.846174	0
Water Truck	6522.405295	19567.21589	13044.81059	2608.962118

Total (g): 10115.15065 82903.10941 21019.13602 5102.811447

Total (tons): **0.119140208**

Emission Calculations for each small Drainage - PM10 Exhaust

Construction Start Year 2018
 Construction Time approx. 1.5 month

Working Days per Month 22 days

Number of Equipment
 (Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane			1	
Excavator			1	
Grader		1		
Off-Highway Truck		3		
Paver				1
Paving Equipment				1
Pile Driver				
Plate Compactor			1	
Roller		1		3
Rubber Tired Dozer	1			
Rubber Tired Loader	1		1	1
Scraper				
Signal Board				
Trencher				
Dumper	1			4
Forklift			1	
Water Truck	1	1	1	1

Notes:

The grubbing/Land Clearing phase is estimated to be 1 week (5 days)

The grading phase is estimated to be 3 weeks (15 days)

The Drainage phase is estimated to be 2 weeks (10 days)

The paving phase is estimated to be 2 days

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	0	302.0087961	0
Excavator	0	0	256.5912815	0
Grader	0	440.8756293	0	0
Off-Highway Truck	0	6690.266784	0	0
Paver	0	0	0	48.66490583
Paving Equipment	0	0	0	32.30433936
Pile Driver	0	0	0	0
Plate Compactor	0	0	21.42653699	0
Roller	0	325.3021596	0	130.1208638
Rubber Tired Dozer	245.427459	0	0	0
Rubber Tired Loader	237.4701109	0	474.9402218	94.98804435
Scraper	0	0	0	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	48.72706835	0	0	77.96330937
Forklift	0	0	97.65036205	0
Water Truck	743.362976	2230.088928	1486.725952	297.3451904

Total (g): 1274.987614 9686.533501 2639.34315 681.3866531

Total (tons): **0.014282251**

Emission Calculations for each small Drainage - NOx

Construction Start Year 2018
 Construction Time approx. 1.5 month

Working Days per Month 22 days

Number of Equipment
 (Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane			1	
Excavator			1	
Grader		1		
Off-Highway Truck		3		
Paver				1
Paving Equipment				1
Pile Driver				
Plate Compactor			1	
Roller		1		3
Rubber Tired Dozer	1			
Rubber Tired Loader	1		1	1
Scraper				
Signal Board				
Trencher				
Dumper	1			4
Forklift			1	
Water Truck	1	1	1	1

Notes:

The grubbing/Land Clearing phase is estimated to be 1 week (5 days)

The grading phase is estimated to be 3 weeks (15 days)

The Drainage phase is estimated to be 2 weeks (10 days)

The paving phase is estimated to be 2 days

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	0	6441.706166	0
Excavator	0	0	4369.140707	0
Grader	0	6848.341955	0	0
Off-Highway Truck	0	223230.792	0	0
Paver	0	0	0	697.9208188
Paving Equipment	0	0	0	401.616534
Pile Driver	0	0	0	0
Plate Compactor	0	0	250.5414375	0
Roller	0	4154.993915	0	1661.997566
Rubber Tired Dozer	4090.617652	0	0	0
Rubber Tired Loader	3838.628972	0	7677.257945	1535.451589
Scraper	0	0	0	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	331.640409	0	0	530.6246543
Forklift	0	0	3851.575065	0
Water Truck	24803.42134	74410.26402	49606.84268	9921.368536

Total (g): 33064.30837 308644.3919 72197.064 14748.9797

Total (tons): **0.428654744**

Emission Calculations for each small Drainage - VOC

Construction Start Year 2018
 Construction Time approx. 1.5 month

Working Days per Month 22 days

Number of Equipment
 (Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane			1	
Excavator			1	
Grader		1		
Off-Highway Truck		3		
Paver				1
Paving Equipment				1
Pile Driver				
Plate Compactor			1	
Roller		1		3
Rubber Tired Dozer	1			
Rubber Tired Loader	1		1	1
Scraper				
Signal Board				
Trencher				
Dumper	1			4
Forklift			1	
Water Truck	1	1	1	1

Notes:

The grubbing/Land Clearing phase is estimated to be 1 week (5 days)

The grading phase is estimated to be 3 weeks (15 days)

The Drainage phase is estimated to be 2 weeks (10 days)

The paving phase is estimated to be 2 days

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	0	658.5572317	0
Excavator	0	0	659.7415631	0
Grader	0	1050.591239	0	0
Off-Highway Truck	0	24434.62332	0	0
Paver	0	0	0	78.38693896
Paving Equipment	0	0	0	42.36784879
Pile Driver	0	0	0	0
Plate Compactor	0	0	33.98814038	0
Roller	0	439.4768473	0	175.7907389
Rubber Tired Dozer	464.1360195	0	0	0
Rubber Tired Loader	379.9547689	0	759.9095379	151.9819076
Scraper	0	0	0	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	72.91591127	0	0	116.665458
Forklift	0	0	509.5408049	0
Water Truck	2714.958147	8144.874441	5429.916294	1085.983259

Total (g): 3631.964847 34069.56585 8051.653572 1651.176151

Total (tons): **0.04740436**

Emission Calculations for LACC - CO

Construction Start Year	2018
Construction Time	15 weeks
Working Days per Month	22 days

Number of Equipment
(Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane		1	2	1
Excavator			1	
Grader		1		
Off-Highway Truck				
Paver				1
Paving Equipment				2
Pile Driver				
Plate Compactor				
Roller		1	2	
Rubber Tired Dozer	1	1		
Rubber Tired Loader	1		1	
Scraper		2		
Signal Board				
Trencher				
Dumper	1			
Forklift				
Water Truck	1	1	1	1

Notes:

The grubbing/Land Clearing phase is estimated to be 1 week (5 days)

The grading phase is estimated to be 3 weeks (15 days)

The Drainage phase is estimated to be 8 weeks (40 days)

The paving phase is estimated to be 3 weeks (15 days)

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	2589.578399	13811.08479	2589.578399
Excavator	0	0	6562.538288	0
Grader	0	2529.451973	0	0
Off-Highway Truck	0	0	0	0
Paver	0	0	0	2283.135921
Paving Equipment	0	0	0	3088.763415
Pile Driver	0	0	0	0
Plate Compactor	0	0	0	0
Roller	0	2104.7939	11225.56746	0
Rubber Tired Dozer	1719.522819	5158.568456	0	0
Rubber Tired Loader	1546.299973	0	12370.39978	0
Scraper	0	17351.91296	0	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	326.9225603	0	0	0
Forklift	0	0	0	0
Water Truck	6522.405295	19567.21589	52179.24236	19567.21589

Total (g):	10115.15065	49301.52157	96148.83268	27528.69362
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Total (tons):	0.183094199
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Emission Calculations for LACC - PM10 Exhaust

Construction Start Year 2018
 Construction Time 15 weeks

Working Days per Month 22 days

Number of Equipment
 (Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane		1	2	1
Excavator			1	
Grader		1		
Off-Highway Truck				
Paver				1
Paving Equipment				2
Pile Driver				
Plate Compactor				
Roller		1	2	
Rubber Tired Dozer	1	1		
Rubber Tired Loader	1		1	
Scraper		2		
Signal Board				
Trencher				
Dumper	1			
Forklift				
Water Truck	1	1	1	1

Notes:

The grubbing/Land Clearing phase is estimated to be 1 week (5 days)

The grading phase is estimated to be 3 weeks (15 days)

The Drainage phase is estimated to be 8 weeks (40 days)

The paving phase is estimated to be 3 weeks (15 days)

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	453.0131941	2416.070368	453.0131941
Excavator	0	0	1026.365126	0
Grader	0	440.8756293	0	0
Off-Highway Truck	0	0	0	0
Paver	0	0	0	364.9867937
Paving Equipment	0	0	0	484.5650904
Pile Driver	0	0	0	0
Plate Compactor	0	0	0	0
Roller	0	325.3021596	1734.944851	0
Rubber Tired Dozer	245.427459	736.282377	0	0
Rubber Tired Loader	237.4701109	0	1899.760887	0
Scraper	0	2240.966837	0	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	48.72706835	0	0	0
Forklift	0	0	0	0
Water Truck	743.362976	2230.088928	5946.903808	2230.088928

Total (g): 1274.987614 6426.529125 13024.04504 3532.654006

Total (tons): **0.024258216**

Emission Calculations for LACC - NOx

Construction Start Year	2018
Construction Time	15 weeks
Working Days per Month	22 days

Number of Equipment
(Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane		1	2	1
Excavator			1	
Grader		1		
Off-Highway Truck				
Paver				1
Paving Equipment				2
Pile Driver				
Plate Compactor				
Roller		1	2	
Rubber Tired Dozer	1	1		
Rubber Tired Loader	1		1	
Scraper		2		
Signal Board				
Trencher				
Dumper	1			
Forklift				
Water Truck	1	1	1	1

Notes:

The grubbing/Land Clearing phase is estimated to be 1 week (5 days)

The grading phase is estimated to be 3 weeks (15 days)

The Drainage phase is estimated to be 8 weeks (40 days)

The paving phase is estimated to be 3 weeks (15 days)

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	9662.559249	51533.64933	9662.559249
Excavator	0	0	17476.56283	0
Grader	0	6848.341955	0	0
Off-Highway Truck	0	0	0	0
Paver	0	0	0	5234.406141
Paving Equipment	0	0	0	6024.248011
Pile Driver	0	0	0	0
Plate Compactor	0	0	0	0
Roller	0	4154.993915	22159.96755	0
Rubber Tired Dozer	4090.617652	12271.85296	0	0
Rubber Tired Loader	3838.628972	0	30709.03178	0
Scraper	0	37065.83291	0	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	331.640409	0	0	0
Forklift	0	0	0	0
Water Truck	24803.42134	74410.26402	198427.3707	74410.26402

Total (g):	33064.30837	144413.845	320306.5822	95331.47742
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Total (tons):	0.593116213
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Emission Calculations for LACC - VOC

Construction Start Year 2018

Construction Time 15 weeks

Working Days per Month 22 days

Number of Equipment
(Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane		1	2	1
Excavator			1	
Grader		1		
Off-Highway Truck				
Paver				1
Paving Equipment				2
Pile Driver				
Plate Compactor				
Roller		1	2	
Rubber Tired Dozer	1	1		
Rubber Tired Loader	1		1	
Scraper		2		
Signal Board				
Trencher				
Dumper	1			
Forklift				
Water Truck	1	1	1	1

Notes:

The grubbing/Land Clearing phase is estimated to be 1 week (5 days)

The grading phase is estimated to be 3 weeks (15 days)

The Drainage phase is estimated to be 8 weeks (40 days)

The paving phase is estimated to be 3 weeks (15 days)

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	987.8358476	5268.457854	987.8358476
Excavator	0	0	2638.966253	0
Grader	0	1050.591239	0	0
Off-Highway Truck	0	0	0	0
Paver	0	0	0	587.9020422
Paving Equipment	0	0	0	635.5177319
Pile Driver	0	0	0	0
Plate Compactor	0	0	0	0
Roller	0	439.4768473	2343.876519	0
Rubber Tired Dozer	464.1360195	1392.408059	0	0
Rubber Tired Loader	379.9547689	0	3039.638152	0
Scraper	0	4043.028407	0	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	72.91591127	0	0	0
Forklift	0	0	0	0
Water Truck	2714.958147	8144.874441	21719.66518	8144.874441

Total (g): 3631.964847 16058.21484 35010.60395 10356.13006

Total (tons): **0.065056914**

Emission Calculations for Salt River - CO

Construction Start Year	2018
Construction Time	11 months
Working Days per Month	22 days

Number of Equipment
(Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane		4	1	2
Excavator			1	
Grader	1		1	
Off-Highway Truck	1			
Paver				2
Paving Equipment				2
Pile Driver				
Plate Compactor				
Roller		2	1	
Rubber Tired Dozer	1	1	1	
Rubber Tired Loader	1	1	2	
Scraper		3	3	
Signal Board				
Trencher				
Dumper	1	1	1	
Forklift		3		3
Water Truck	1	2	2	2

Notes:

The grubbing/Land Clearing phase is estimated to be 1 month

The grading phase is estimated to be 8 months

The Drainage phase is estimated to be 1 month

The paving phase is estimated to be 1 month

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	121537.5462	3798.048318	7596.096636
Excavator	0	0	3609.396058	0
Grader	3709.862893	0	3709.862893	0
Off-Highway Truck	28698.5833	0	0	0
Paver	0	0	0	6697.198702
Paving Equipment	0	0	0	4530.186342
Pile Driver	0	0	0	0
Plate Compactor	0	0	0	0
Roller	0	49392.49684	3087.031053	0
Rubber Tired Dozer	7565.900401	60527.20321	7565.900401	0
Rubber Tired Loader	6803.719879	54429.75903	13607.43976	0
Scraper	0	305393.6681	38174.20852	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	1438.459265	11507.67412	1438.459265	0
Forklift	0	68948.67799	0	8618.584748
Water Truck	28698.5833	459177.3328	57397.1666	57397.1666

Total (g):	76915.10903	1130914.358	132387.5129	84839.23302
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Total (tons):	1.425056213
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Emission Calculations for Salt River - PM10 Exhaust

Construction Start Year 2018
 Construction Time 11 months

Working Days per Month 22 days

Number of Equipment
 (Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane		4	1	2
Excavator			1	
Grader	1		1	
Off-Highway Truck	1			
Paver				2
Paving Equipment				2
Pile Driver				
Plate Compactor				
Roller		2	1	
Rubber Tired Dozer	1	1	1	
Rubber Tired Loader	1	1	2	
Scraper		3	3	
Signal Board				
Trencher				
Dumper	1	1	1	
Forklift		3		3
Water Truck	1	2	2	2

Notes:

The grubbing/Land Clearing phase is estimated to be 1 month

The grading phase is estimated to be 8 months

The Drainage phase is estimated to be 1 month

The paving phase is estimated to be 1 month

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	21261.41924	664.4193513	1328.838703
Excavator	0	0	564.5008194	0
Grader	646.6175896	0	646.6175896	0
Off-Highway Truck	3270.797094	0	0	0
Paver	0	0	0	1070.627928
Paving Equipment	0	0	0	710.6954659
Pile Driver	0	0	0	0
Plate Compactor	0	0	0	0
Roller	0	7633.757345	477.109834	0
Rubber Tired Dozer	1079.88082	8639.046556	1079.88082	0
Rubber Tired Loader	1044.868488	8358.947903	2089.736976	0
Scraper	0	39441.01633	4930.127041	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	214.3991008	1715.192806	214.3991008	0
Forklift	0	5155.939116	0	644.4923895
Water Truck	3270.797094	52332.75351	6541.594189	6541.594189

Total (g): 9527.360186 144538.0728 17208.38572 10296.24867

Total (tons): **0.181570067**

Emission Calculations for Salt River - NOx

Construction Start Year 2018
 Construction Time 11 months
 Working Days per Month 22 days

Number of Equipment
 (Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane		4	1	2
Excavator			1	
Grader	1		1	
Off-Highway Truck	1			
Paver				2
Paving Equipment				2
Pile Driver				
Plate Compactor				
Roller		2	1	
Rubber Tired Dozer	1	1	1	
Rubber Tired Loader	1	1	2	
Scraper		3	3	
Signal Board				
Trencher				
Dumper	1	1	1	
Forklift		3		3
Water Truck	1	2	2	2

Notes:

The grubbing/Land Clearing phase is estimated to be 1 month

The grading phase is estimated to be 8 months

The Drainage phase is estimated to be 1 month

The paving phase is estimated to be 1 month

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	453496.1141	14171.75357	28343.50713
Excavator	0	0	9612.109555	0
Grader	10044.23487	0	10044.23487	0
Off-Highway Truck	109135.0539	0	0	0
Paver	0	0	0	15354.25801
Paving Equipment	0	0	0	8835.563749
Pile Driver	0	0	0	0
Plate Compactor	0	0	0	0
Roller	0	97503.85721	6093.991076	0
Rubber Tired Dozer	17998.71767	143989.7413	17998.71767	0
Rubber Tired Loader	16889.96748	135119.7398	33779.93496	0
Scraper	0	652358.6593	81544.83241	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	1459.217799	11673.7424	1459.217799	0
Forklift	0	203363.1634	0	25420.39543
Water Truck	109135.0539	1746160.862	218270.1078	218270.1078

Total (g): 264662.2456 3443665.88 392974.8997 296223.8321

Total (tons): **4.397526857**

Emission Calculations for Salt River - VOC

Construction Start Year 2018

Construction Time 11 months

Working Days per Month 22 days

Number of Equipment
(Operating at 8 hours per day)

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane		4	1	2
Excavator			1	
Grader	1		1	
Off-Highway Truck	1			
Paver				2
Paving Equipment				2
Pile Driver				
Plate Compactor				
Roller		2	1	
Rubber Tired Dozer	1	1	1	
Rubber Tired Loader	1	1	2	
Scraper		3	3	
Signal Board				
Trencher				
Dumper	1	1	1	
Forklift		3		3
Water Truck	1	2	2	2

Notes:

The grubbing/Land Clearing phase is estimated to be 1 month

The grading phase is estimated to be 8 months

The Drainage phase is estimated to be 1 month

The paving phase is estimated to be 1 month

Total Emission

	Grubbing/Land Clearing	Grading	Drainage	Paving
Crane	0	46362.42911	1448.82591	2897.65182
Excavator	0	0	1451.431439	0
Grader	1540.867151	0	1540.867151	0
Off-Highway Truck	11945.81585	0	0	0
Paver	0	0	0	1724.512657
Paving Equipment	0	0	0	932.0926735
Pile Driver	0	0	0	0
Plate Compactor	0	0	0	0
Roller	0	10313.05668	644.5660427	0
Rubber Tired Dozer	2042.198486	16337.58789	2042.198486	0
Rubber Tired Loader	1671.800983	13374.40787	3343.601967	0
Scraper	0	71157.29996	8894.662496	0
Signal Board	0	0	0	0
Trencher	0	0	0	0
Dumper	320.8300096	2566.640077	320.8300096	0
Forklift	0	26903.7545	0	3362.969312
Water Truck	11945.81585	191133.0536	23891.63169	23891.63169

Total (g): 29467.32832 378148.2296 43578.61519 32808.85816

Total (tons): **0.484003031**

Fugitive Dust Calculations in the waters of the US

	Activity Days				month
	Grubbing/Land Clearing	Grading	Drainage	Total All	
47 small drainages	5	15	10	30	1
LACC	5	15	40	60	2
Salt River	22	176	22	220	8
Total	32	206	72	310	11

Small Drainages

PM Uncontrolled Emissions

= total acres X No. Months X EF

=7.51 X 1 X 0.265

=1.99 tons

PM Controlled Emissions

=PM Uncontrolled Emissions X [1-(control efficiency X rule effectiveness)]

=1.99 X 81.80%

=1.63 tons

LACC

PM Uncontrolled Emissions

= total acres X No. Months X EF

=0.788 X 2 X 0.265

=0.42 tons

PM Controlled Emissions

=PM Uncontrolled Emissions X [1-(control efficiency X rule effectiveness)]

=0.42 X 81.80%

=0.34 tons

Salt River

PM Uncontrolled Emissions

= total acres X No. Months X EF

=8.979 X 8 X 0.265

=19.04 tons

PM Controlled Emissions

=PM Uncontrolled Emissions X [1-(control efficiency X rule effectiveness)]

=19.04 X 81.80%

=15.57 tons

Total PM Fugitive Dust Emissions

=1.63 + 0.34 + 15.57

=17.54 tons

APPENDIX C
COMMENTS RECEIVED AND THE CORPS' RESPONSES

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
1	Public Notice	E-mail	Melissa Scianni	EPA	1	Alternatives Analysis and LEDPA [Least Environmentally Damaging Practicable Alternative] analysis as it relates to wildlife, water quality, and cumulative impacts in the watershed	The 404(b)(1) process requires an alternative analysis to determine least environmentally damaging practicable alternative (LEPDA). It evaluates a list of criteria which included wildlife, water quality and cumulative impacts. As noted in the 404(b)(1) analysis, crossing designs were developed with wildlife considerations in mind by the applicant after consultation with the Gila River Indian Community (Community) and Arizona Game and Fish Department (AZGFD).
2	Public Notice	E-mail	Melissa Scianni	EPA	2	Compensatory mitigation should be provided for all permanent impacts (not just for crossings where permanent impacts > 0.5 acre) and ADOT and the Corps should also consider opportunities to improve wash connectivity between South Mountain and the Estrella Mountains.	The Corps has analyzed the impacts of the project, as documented in the Corps' Record of Decision (ROD) and the 404(b)(1) analysis. The applicant will provide compensatory mitigation for all permanent impacts to waters of the US (WUS). Connectivity between the South Mountain range and the Sierra Estrella range will remain the same as drainage will enter and exit the right-of-way (ROW) in their existing channels. As stated in the applicant's response to comments, Arizona Department of Transportation (ADOT) has included wildlife crossings (five multi-use overpasses and two small-animal crossings) in the freeway design based on coordination with the Community, AZGFD, and consultant biologists based on current agency guidelines. In addition, the existing crossings along the Pecos Segment will be replaced with larger, properly sized crossings that can convey the 50-year flow event.
3	Public Notice	Letter	Gregor Blackburn	FEMA	1	Review the current FIRMS and adhere to NFIP floodplain management building requirements.	The project will affect two 100-year floodplains in the project area. However, impacts from floodplain encroachment will be effectively mitigated through elevated bridged crossings of the Salt River and Roosevelt Irrigation District (RID) Canal using appropriate bridge design. The applicant has coordinated with the City of Phoenix and the Flood Control District of Maricopa County (FCDMC), who have both reviewed and signed the Conditional Letter of Map Revision (CLOMR), which has been submitted to the Federal Emergency Management Agency (FEMA).
4	Public Notice	Letter	Gregor Blackburn	FEMA	2	Contact the local floodplain manager for any local floodplain management building requirements.	The applicant has coordinated with the City of Phoenix and the FCDMC, who have both reviewed and signed the CLOMR, which has been submitted to the FEMA.
5	Public Notice	Letter	Unknown	Gila River Indian Community (GRIC) GOV	1	The scope of the Corps review is too narrow. The Corps cannot rely on the ADOT/FHWA EIS as a basis for granting the permit and must comply with the Section 404(b)(1) guidelines, which require the Corps to consider direct and indirect	The Corps was a cooperating agency on the ADOT/Federal Highway Administration (FHWA) Final Environmental Impact Statement (FEIS), and will use this document, along the re-evaluations, and supplemental information report (SIR) to inform its decision. However, there are other regulatory requirements, including the 404(b)(1) Guidelines, that will provide necessary information and the decision to grant a permit will not be wholly based on the FEIS. While the Corps recognizes that its jurisdiction is limited to waters of the United States (US), it is also required to consider

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
						impacts to adjacent Community lands from work in waterways. The Corps must also determine whether the current proposed project is the LEDPA.	the impacts of the activity in areas where impacts are caused by or are a product of the Corps' permitted activity (33 Code of Federal Regulation (CFR) Part 325 Appendix B and C, 50 CFR 402.02). The Corps has completed a 404(b)(1) analysis that considered the direct/indirect, and cumulative impacts and determined the proposed action is the LEDPA.
6	Public Notice	Letter	Unknown	GRIC GOV	2	Issuing a Section 404 Permit is not in the public interest because the detriments of the project outweigh the benefits.	The Corps conducted a public interested review per 33 CFR 320.4(a), which is included in the Corps' SIR. The reasonably expected benefits and detriments of the project were evaluated based on the public interest factors. While there are detriments associated with the proposed project, the benefits outweigh those detriments and the project was found to be not contrary to the public interest, as documented in the Corps' ROD.
7	Public Notice	Letter	Unknown	GRIC GOV	3	The Project will have significant impacts on South Mountain, one of the [Gila River Indian] Community's most important Traditional Cultural Properties (TCPs).	As mentioned in the ADOT/ FHWA FEIS, 404(b)(1) analysis, and the public interest review, the project will result in impacts to the South Mountain traditional cultural property (TCP). However, the project will not prohibit ongoing access or cultural and religious practices by Native American Tribes. As stated in the ADOT/ FHWA FEIS and the applicant's response to comments, avoidance alternatives were evaluated and mitigation measures developed to minimize harm and ensure that Community members are able to access the South Mountains TCP. A programmatic agreement (PA), which designates the FHWA as the lead Federal agency for Section 106, has been developed and implemented. This agreement includes stipulations to mitigate impacts to cultural resources and commits ADOT and FWHA to fund a TCP enhancement and management plan, which would be prepared by the Community.
8	Public Notice	Letter	Unknown	GRIC GOV	4	The project will have significant impacts on aquatic resources located on Community lands.	Mitigation measures have been developed to minimize impacts on aquatic resources, as described in the ADOT/ FHWA FEIS, 404(b)(1) analysis, the ROD's prepared by FHWA and the Corps. With the inclusion of special conditions, impacts from the authorized activities on aquatic resources would be minimized. The proposed action was found to be the LEDPA and not contrary to the public interest.
9	Public Notice	Letter	Unknown	GRIC GOV	5	The project will result in contamination of runoff to Community lands because on-site drainage could comeingle with off-site drainage	The Corps permit will contain mitigation measures that address water quality as well as the Section 401 Certification, which is a part of the 404 permit. The applicant has included design features to treat runoff prior to discharge into WUS through the use of first-flush basins. These basins detain the first ½” of pavement runoff (i.e., the first ½” of rain that falls on pavement, which typically contains the highest concentration of pollutants) for a period of time sufficient to reduce peak discharge and allow suspended pollutants to be removed through settling before being slowly

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
							released to receiving waters (typically WUS) via the basin spillways. The applicant will operate this system under its Municipal Separate Storm Sewer System (MS4) permit from the Arizona Department of Environmental Quality (ADEQ), which manages water quality under Section 401 and 402 of the Clean Water Act (CWA).
10	Public Notice	Letter	Unknown	GRIC GOV	6	The project could impact water quality at the Pee Posh Wetlands, and construction could disrupt flows to the wetlands, both of which could cause loss of wildlife and habitat.	The potential for impacts to the Pee Posh wetlands is low. The proposed action does not discharge onsite flows into the Laveen Conveyance Channel (LACC), which supplies water to the Pee Posh Wetlands. In addition, the Corps has included a special condition stating that the applicant must maintain flows in the LACC during construction and must notify and coordinate with the Community in advance if water flow may be interrupted for any reason. As the applicant states in their comment responses, the project is subject to a Section 401 Water Quality Certification and will implement a Stormwater Pollution Prevention Plan (SWPPP), which contain requirements to protect water quality.
11	Public Notice	Letter	Unknown	GRIC GOV	7	The ADOT/FHWA EIS indicates that the Rio Salado Oeste (RSO) project may have a beneficial impact on the Pee Posh Wetlands. However, the RSO project may not benefit the Pee Posh Wetlands because funding for the RSO project is questionable, and while the RSO project may restore conditions near the freeway, it may not have a beneficial impact to the Pee Posh Wetlands. This must be considered in the Corps' permit decision.	The Corps considered the South Mountain Freeway's (SMF) potential impacts on the proposed Rio Salado Oeste ecosystem restoration and recreation project (RSO) and the Pee Posh Wetlands since these restoration projects may be indirectly impacted by the freeway. The RSO, if it is implemented in the future, will likely extend beneath the SMF's Salt River bridges continue to the west towards 83rd Avenue and the Pee Posh Wetlands. The benefits to the Pee Posh Wetlands from the RSO would likely depend on the proximity of the RSO and the volume of water needed to establish a connection between the two restoration projects. Since design of the RSO between 51st Avenue and 83rd Avenue has not occurred, it cannot be determined with certainty if any benefit to the Pee Posh Wetlands will occur. Regardless, the SMF is not a factor that would influence any connectivity that would occur between the two restoration projects and this issue is not relevant to the permit decision.
12	Public Notice	Letter	Unknown	GRIC GOV	8	The project will change drainage patterns, which could have significant impacts to Community lands.	All drainages will remain in their pre-construction configurations, and no flows would be truncated or redirected to other drainages. As stated by the applicant, the project has been designed to minimize impacts to drainage patterns. Drainage crossings have been designed to prevent increases in discharge, velocity, or water surface elevation outside of the ROW, which could result in scour, erosion, or flooding. A review of the drainage reports for the Pecos Segment by the Los Angeles District's Engineering Division

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
							concurring that the project would not likely result in downstream impacts, as documented in the Supplemental Information Report (SIR). However, information on the Center Segment is not available at the time of the permit decision. Therefore, the Corps will require that the Permittee provide the remaining reports prior to initiating construction in the Center Segment so that a similar review can be completed. Please see response above for Unknown, GRIC GOV Comment 5.
13	Public Notice	Letter	Unknown	GRIC GOV	9	The project will convey waters directly onto Community lands, and the Corps cannot rely upon ADOT's commitment to coordinate with the Community regarding drainage as a substitute for considering impacts to Community lands.	<p>In May 2017, the Corps engaged the Community, ADOT, and Connect 202 Partners (C202P) in order to facilitate reviews of drainage information by the Corps and the Community. Utilizing Engineering Division staff, the Corps reviewed drainage reports and modeling data for the Pecos Segment to verify if the design would not result in drainage impacts downstream of the project on Community lands.</p> <p>The Corps reviewed the methodology Connect 202 and ADOT used to analyze the existing and proposed 100-yr hydrology and hydraulics. The review included spot checking flow rate calculations, water surface elevations, flow velocities, and flow patterns in the vicinity of existing and proposed culverts in the Pecos Segment. Input data for various HEC-RAS models was also checked. Since the information was developed using ADOT's specifications and accepted by the department, the general procedures and analyses results were evaluated, and an in-depth check of all of the C202P's H&H calculations was not conducted. The evaluation considered changes in the flow patterns and increases in flow velocity to determine if there would be downstream impacts to the Community due to the SMF. The review determined that it could be reasonably determined that existing flow patterns are being maintained in the areas reviewed.</p> <p>In regards to the Center Segment, ADOT and C202P have consulted with the Community since June 2017 regarding the design of this segment. As a result, design modifications were made to address the comments received to reduce impacts and maintain existing flow characteristics. Since the drainage analysis was not available for the Center Segment at the time of the review, the Corps will undertake a similar review once the information is available and prior to authorizing any work within WUS in the segment. In addition, the Corps will request that ADOT consider the Komatke Area Drainage Master Study. If the review confirms that no downstream impacts would occur as a result of the freeway, construction would be authorized in WUS in the Center Segment. Since no downstream impacts would be occurring and all existing flow patterns and drainage configurations would</p>

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
							preserved, there would likely be little to no impact on the projects proposed in the Komatke Area Drainage Master Plan.
14	Public Notice	Letter	Unknown	GRIC GOV	10	The project will obstruct sheet flow and direct runoff to point sources, potentially resulting in greater flow volumes and/or drainage pattern changes on Community lands, which has the potential to impact land uses, such as worsening flooding conditions at Komatke and the Vee Quiva Casino. The project would also likely require the Community to modify its Komatke Area Drainage Master Study (ADMS), which would significantly increase the ADMS project costs.	During the spring 2017, the Corps requested that the applicant consult with the Community to identify concerns regarding the concentration of upland sheet flows into WUS. ADOT and the C202P subsequently met with the Community to identify specific issues regarding drainage design near Komatke and the Vee Quiva Casino. As a result of these meetings, the applicant updated the drainage designs in an effort to address these concerns. Updated impact sheets provided to the Corps in October show that additional culverts were added in upland areas, while spreader basins were added downstream of the freeway within WUS in an effort to maintain the existing surface flow patterns downstream of the project on Community lands. Once drainage information for the Center Segment has been finalized, the Corps will review the information to ensure that the project will not result in changes in drainage characteristics downstream of the project. A special condition placed on the permit would not authorize construction in the Center Segment until ADOT and C202P have considered the ADMS and the Corps review has been completed.
15	Public Notice	Letter	Unknown	GRIC GOV	11	ADOT needs to conduct a drainage/flooding analysis and the Corps should consider such an analysis in its decision making.	As stated in the applicant's response, a drainage master plan and drainage reports are being developed. Both the Corps and the Community have reviewed the information finalized for the Pecos Segment, and will complete a similar review on the Center Segment once it is finalized.
16	Public Notice	Letter	Unknown	GRIC GOV	12	The project will directly impact the Community's air quality; ADOT has not addressed these impacts and ADOT's PM-10 analysis omitted impacts to Community lands.	Section 176(c) of the Clean Air Act requires federal agencies to assure that their actions conform to applicable implementation plans for achieving and maintaining the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. Based on the general conformity regulations, federal agencies are only required to consider the emissions resulting directly or indirectly from their actions. Federal agencies are not legally required to document, analyze, and seek mitigation measures for any indirect emissions that the agency cannot practicably control or will not have a continuing program responsibility to maintain control over such emissions (Federal Register Vol. 75, pgs. 17254, 17260 (April 5, 2010)). In regards to the SMF, the Corps only has reasonable control over the construction activities associated with the discharge of fill material occurring within WUS, and has no control over the use of the freeway (and the vehicle emissions which result from its use). The Environmental Protection Agency has classified the Phoenix metropolitan area as a federal nonattainment area for particulate matter (PM10) and ozone (O ₃) and a maintenance area for

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
							carbon monoxide (CO). The Corps requested that the applicant complete an air quality analysis on the emissions resulting from construction activities within WUS. Based on this analysis, the Corps has determined that the direct and indirect emissions of criteria pollutants resulting from the approval of a Section 404 permit do not equal or exceed the applicability rates established at 40 CFR 93.153(b)(2), and a conformity determination is not required. The emissions associated with the Corps' action are not likely to cause or contribute to any new violation of air quality standards; increase the frequency or severity of any existing violation of any NAAQS; or delay timely attainment of any NAAQS or interim emission reductions.
17	Public Notice	Letter	Unknown	GRIC GOV	13	ADOT failed to conduct an Environmental Health Assessment for Hazardous Air Pollutants, and MSATs analysis, or to address potential impacts to the Community.	Please see response above for Unknown, GRIC GOV Comment 12.
18	Public Notice	Letter	Unknown	GRIC GOV	14	ADOT failed to address an EPA comment concerning air quality and Community land-use planning, and the Corps cannot ignore the need for an analysis of air quality impacts to the Community.	Please see response above for Unknown, GRIC GOV Comment 12.
19	Public Notice	Letter	Unknown	GRIC GOV	15	The proposed project is not the LEDPA and the Corps must consider impacts to South Mountain and other protected resources in its LEDPA Analysis.	Please see response above for Unknown, GRIC GOV Comment 1.
20	Public Notice	Letter	Unknown	GRIC GOV	16	Further Alternatives Analysis is required before the Corps can identify the LEDPA, including alternatives located north of South Mountain, because the Corps can't rely solely on the ADOT/FHWA EIS, and the EIS	The Corps reconsidered an alternative from the ADOT/ FHWA FEIS under the 404(b)(1) Guidelines that would locate the freeway north of the South Mountains and cross the Salt River at one of three potential locations. The alternative was not considered in detail in the ADOT/ FHWA FEIS since it resulted in significant adverse impacts to South Mountain Village and did not best accomplish the purpose and need of the project. Similarly, while alternatives north of the South Mountains result in the least amount of WUS being impacted, the Corps does not consider this alternative to be

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
						failed to adequately address those alternatives.	practicable since it does not meet the overall project purpose and results in significant adverse environmental impacts to South Mountain Village. Please refer to Section 4.2.1 of the 404(b)(1) Analysis for details.
21	Public Notice	Letter	Unknown	GRIC GOV	17	ADOT has not adequately analyzed alternatives, especially those located north of South Mountain, to allow the Corps to conclude that impacts to WUS were avoided or minimized to the greatest extent possible.	Please see response for the GRIC GOV Comment 16. The Corps participated in the development of alternatives for consideration in the ADOT/ FHWA FEIS, as well as analyzed design alternatives in the 404(b)(1) analysis that minimize or avoid impacts to WUS.
22	Public Notice	Letter	Unknown	GRIC GOV	18	There is no reasonable basis for limiting mitigation to impacts above 0.5 acre at a single crossing, all impacts to WUS should be mitigated.	Since the initial public notice that was issued in November 2016, the applicant has submitted a revised compensatory mitigation plan that includes mitigation for all permanent impacts to WUS, and the Corps has accepted this plan.
23	Public Notice	Letter	Unknown	GRIC GOV	19	ADOT must provide mitigation to protect the health, safety, and welfare of Community members, as well as the integrity of Community infrastructure.	<p>FHWA's ROD outlines environmental commitments and mitigation measures to minimize impacts on the health, safety, and welfare of the public. As the lead Federal Agency, it is FHWA's responsibility to ensure that these are fully implemented. In addition, the Corps has placed special conditions on the Section 404 permit to protect the public against adverse impacts resulting from activities within its scope and authority. Please refer to these documents for details.</p> <p>To minimize potential impacts to the Community's infrastructure, efforts were made during design to reduce the project's potential to cause flooding or modify existing flow conditions downstream of the project. For example, onsite flows from the freeway would be routed to first flush basins where it would be slowly released to offsite drainage features, which are typically WUS. Offsite drainage features would be passed under the freeway through structures designed to convey the 50-year flow event. For the 100-year event, all culverts are designed to cause no increase in water surface elevations from existing conditions upstream or downstream of the project ROW or easement. ADOT has placed the following binding requirements on C202P to ensure that the project will not contribute to flooding issues on Community lands:</p> <ul style="list-style-type: none"> • C202P shall not permit any increase in water surface elevation from existing conditions upstream or downstream of the project ROW.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
							<ul style="list-style-type: none"> • Modifications must be made to new or existing drainage features to achieve no rise in water surface elevation outside of the ROW. • Discharge, velocity, or water surface elevation at the outfalls to existing drainage conveyance features must not increase from the existing conditions. <p>These requirements have been incorporated into special conditions on the permit. In addition, the Corps has conducted a review of the drainage design to verify if there will be downstream impacts caused by the freeway design. The Corps completed its review on Pecos Segment, and has placed an additional special condition on the permit requiring Corps review on the Center Segment drainage design prior to construction beginning within WUS.</p>
24	Public Notice	Letter	Unknown	GRIC GOV	20	The Corps must analyze the project's probable cumulative impacts to waterways on Community lands.	The Corps has analyzed the impacts of the project, as documented in the Corps' ROD and the 404(b)(1) analysis. The applicant will provide compensatory mitigation for all permanent impacts to WUS. Secondary and cumulative impacts to water resources are discussed in the ADOT/ FHWA DEIS Volume I, Chapter 4 (Secondary and Cumulative Impacts), Pages 4-167 through 4-177; and in ADOT/ FHWA FEIS Volume I, Chapter 4 (Secondary and Cumulative Impacts), Pages 4-179 through 4-189, and 404(b)(1) analysis.
25	Public Notice	Letter	Unknown	GRIC GOV	21	Because ADOT is using design-build project delivery, the full range of impacts will not be known at the time the Corps is making its permit decision. Therefore, the Corps should include conditions in the permit to ensure impacts to the Community are avoided, minimized, and mitigated.	The Corps recognizes that design-build projects frequently undergo design changes up to final construction, which often require additional authorization or permit modification from the Corps to address additional impacts that were unforeseen. The Corps has placed special conditions on the permit for this project that provide flexibility for the design-build process to occur but still provide protections for the aquatic ecosystem. If design changes occur after permit issuance that result in additional impacts, the applicant will be required to contact the Corps so that it may determine if additional authorization is required to comply with the Clean Water Act. The applicant would be required to avoid, minimize, or mitigate those additional impacts as necessary to ensure that the project results in no net loss of aquatic resources.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
26	Public Notice	Letter	Unknown	GRIC GOV	22	The Corps should hold a public hearing on the permit application, and at a location that is convenient for Community members.	The Corps held a public hearing on May 9, 2017 at the Boys and Girls Club in Komatke on the Community.
27	Public Notice	Letter	Unknown	GRIC GOV	23	The Corps should deny ADOT's permit application.	Comment noted. As documented in the Corps' ROD and 404(b)(1) analysis, the Corps determined that the activities proposed in WUS would comply with the Guidelines and would not be contrary to the public interest if special conditions were placed on the permit to minimize potential impacts to the aquatic environment and compensate for any losses. The Corps does not feel that denying the permit is reasonable or justified.
28	Public Notice	Letter	Unknown	GRIC GOV	24	If the Corps issues a permit, it should include conditions and mitigation obligations with financial assurances to protect the Community from adverse impacts of permit issuance.	The Corps may require financial assurances that would ensure the successful completion of compensatory mitigation, however Corps Regulatory does not have the ability to require financial assurances related to adverse impacts from permit issuance. The Corps has reviewed the proposed projects in light of all relevant regulatory requirements. The Corps has determined that the proposed project is the LEDPA and any adverse impacts are or will be mitigated.
29	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	1	Section 106 response letter stating that Hopi has reviewed a damage assessment report for site 201 (damage by others).	The Corps recognizes there are cultural and religious places of importance, such as the South Mountains, which were referenced in the ADOT/ FHWA FEIS. To account for these resources, FHWA and ADOT conducted cultural resource studies and continue engaging the Community Tribal Historic Preservation Officer (THPO) and other Tribes regarding the identification and evaluation of places of religious and cultural importance to Native Americans. This consultation will continue until all commitments from the ADOT/FHWA ROD and PA are completed.
30	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	2	Section 106 response letter that includes a request for continued consultation, including being provided copies of the draft data recovery reports for sites 221 and 423.	Because effects on National Historic Preservation Act (NHPA)-eligible sites are not fully known until on-going data recovery is complete, a PA has been developed and executed. The Corps is a concurring party to this agreement, which designates FHWA to act as lead federal agency for the purposes of Section 106 compliance. The PA describes the process for proper treatment and management of affected resources, outlines the specific actions and their responsible parties, and includes the ongoing consultation requirements.
31	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	3	Section 106 response letter that includes a request for continued consultation, including being provided a copy of the draft data recovery report for site 52.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.

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32	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	4	Section 106 response letter that includes a request for continued consultation, including being provided a copy of data recovery results for site 206 and other sites adversely affected by the project.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
33	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	5	Section 106 letter response regarding additional survey and reiterating request for continued consultation, including being provided copies of draft treatment reports.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
34	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	6	Section 106 response letter that includes a statement that the Hopi do not support relocating rock art, but will defer to other Native American groups.	The PA describes the process for proper treatment and management of affected resources, outlines the specific actions and their responsible parties, and includes the ongoing consultation requirements. FHWA and ADOT will coordinate with all the consulting Tribes to determine treatment of the rock art.
35	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	7	Reiteration of Hopi request for continued consultation, including being provided copies of draft treatment reports.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
36	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	8	Section 106 response letter regarding review of treatment plan that includes a request for continued consultation, including being provided copies of treatment reports.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
37	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	9	Section 106 response letter that includes a question whether certain sites will be addressed in a separate treatment plan.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
38	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	10	Reiteration of Hopi request for continued consultation, including being provided copies of draft treatment reports.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
39	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	11	Section 106 response letter that includes a request for continued consultation, including being provided a copy of the draft treatment plan.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.

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40	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	12	Section 106 response letter that includes a request to be provided with copies of cultural resource surveys, archaeological treatment plans, and archaeological reports.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
41	Public Notice	Letter	Leigh Kuwanwisiwma	Hopi	13	Section 106 response letter that includes concurrence with determination of project effect to historic properties.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
42	Public Notice	E-mail	Mary-Ellen Walsh	SHPO	1	Questions whether the Corps was signatory to the FHWA Cultural Programmatic Agreement.	The Corps has been involved as a consulting party on the project, and in response to ADOT's permit application signed the PA as a concurring party on September 26, 2017.
43	Public Notice	E-mail	Richard Militello	Individual	1	The project will cause unacceptable noise impacts along Pecos Road.	Page 55 of the FHWA ROD discusses the noise impacts resulting from the project, and the applicant has provided this information in their response to comments. The Corps conducted a public interest review per 33 CFR 320.4(a), which is included in the SIR, with conclusions reached in the ROD. However, detrimental effects resulting from traffic noise from the freeway would last throughout the life of the project even with the measures to mitigate for noise. These impacts would be primarily felt by residents near the project, and to a lesser extent, the visitors in the western portion of the South Mountain Park Preserve (SMPP). While there are detriments associated with the proposed project, the benefits outweigh those detriments and the project was found to not be contrary to the public interest.
44	Public Notice	E-mail	Richard Militello	Individual	2	The project will cause unacceptable visual impacts along Pecos due to impacts to South Mountain and construction of noise walls.	As described in Section 6.3.4 of the 404(b)(1) analysis and page B1031 of Volume III: Comment Response Appendix of the ADOT/FHWA FEIS, page B1031, introduction of the new freeway will change the visual character of the area. To minimize impacts in the South Mountains area, the road cuts proposed for the western end of the South Mountains would be designed to ensure that the newly exposed rock faces would match the adjacent natural rock features, including scale, shape, slope, and fracturing as much as possible. Native desert vegetation and neutral-colored hardscaping, similar to that found on other Phoenix area freeways, would be used. ADOT is working with municipalities' staff to incorporate aesthetically pleasing features into the project to offset impacts. Regardless, some views would remain adversely altered.
45	Public Notice	E-mail	Richard Militello	Individual	3	The project will cause pollution impacts.	The Corps' permitted activities will not exceed the applicability rates per the Air Quality Conformity Analysis. In addition, the project will be required to comply with Section 401, 402 and 404 of the CWA as well as ADOT's MS4 permit requirements. Please see ADOT/FHWA FEIS

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							analysis page 4-78, as well as the responses for Unknown GRIC GOV 5 and 12.
46	Public Notice	E-mail	Richard Militello	Individual	4	The project will negatively affect property values along Pecos Road.	As discussed on page 53 of the FHWA ROD, few detailed analyses on the subject exist. However, based on the information available (which includes a case study on the Superstition Freeway in Phoenix), freeway construction may have an adverse impact on some properties, but in the aggregate, property values tend to increase.
47	Public Notice	E-mail	Richard Militello	Individual	5	Gila River Indian Community members were denied access to a public meeting.	This comment refers to a public meeting that the applicant held on September 27, 2016, and was not related to the Corps' permit process. During the public meeting held by the Corps on May 9th, 2017, no one was denied access to the public hearing, and prayers sticks were allowed within the hearing room. The only items that were not allowed in the hearing room were posters and banners, but these items were permitted outside of the hearing room within the building and parking lot.
48	Public Notice	E-mail	Richard Militello	Individual	6	The project will impact water wells.	As documented in the ADOT/ FHWA FEIS, it is expected that some wells may be impacted. However, while this is a public interest review factor, none of these wells are located within the Corps' permit area so none would be impacted by the permit decision. The applicant has stated that the loss of wells would be mitigated through replacement wells or compensation by ADOT as outlined by state law. Irrigation features would be re-routed, converted to pipes that cross under the freeway, or the water supplied by these irrigation features would be otherwise replaced
49	Public Notice	E-mail	Richard Militello	Individual	7	The existing Pecos Road should be improved instead of converting it to freeway.	As documented in the ADOT/FHWA FEIS and the applicant's response to this comment, alternatives that considered alignments other than Pecos Road and non-freeway options such as arterial street improvements were considered. It was determined that non-freeway options would lack capacity to meet project transportation demands and did not meet the project's purpose and need. In addition, Community members supported a no-build option through a 2012 referendum, and no permission was granted by the Community to study alignment alternatives on their lands. To reduce impacts to residents and the South Mountains, the Pecos Road was found to be the only practicable action alternative in the Eastern Section of the Study Area.

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50	Public Notice	E-mail	Richard Militello	Individual	8	The freeway should be depressed.	Depressing the freeway alignment was considered during the ADOT/FHWA FEIS. Particularly along Pecos Road, depressing the freeway would eliminate drainage crossings and result in WUS losing their downstream connections. This would likely result in flooding of adjacent properties or the need for a pumping system to convey these flows under the freeway. Depressing the freeway would result in increased impacts to WUS, which likely would not meet the requirements of the 404(b)(1) Guidelines.
51	Public Notice	E-mail	David Folts	Individual	1	Questions the type and extent of subsurface investigations completed for archaeological sites.	Please see response above for Leigh Kuwanwisiwma, Hopi Comments 1 and 2.
52	Public Notice	E-mail	David Folts	Individual	2	Suggests subsurface mapping of archaeological sites should be completed.	Please see response above for Leigh Kuwanwisiwma, Hopi Comment 6.
53	Public Notice	E-mail	David Folts	Individual	3	Questions whether there will be independent archaeologists monitoring construction.	Please see response above for Leigh Kuwanwisiwma, Hopi Comment 6.
54	Public Notice	E-mail	Beth Gagnon	Individual	1	The absence of a 32nd Street Traffic Interchange will cause unacceptable traffic impacts.	The applicant states that a traffic interchange was not included at 32 nd Street because of the cost and the need for undesirable residential displacements. The City of Phoenix study showed that there would be no adverse impacts on the local street systems as a result of the freeway. On the project's website (southmountainfreeway.com), the applicant has stated that a traffic interchange may built in the future if the need for one becomes apparent. Ramps for this traffic interchange would be located in/over WUS. However, if a traffic interchange were constructed here, there would likely be no additional impacts to WUS beyond the currently proposed design since the nearly all of the drainage within the ROW would be placed in a culvert. Please see the response provided by ADOT concerning its transportation planning efforts.

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55	Public Notice	E-mail	Beth Gagnon	Individual	2	ADOT's EIS did not comply with Section 404(b)(1) and ADOT has not complied with other environmental laws/regulations such as unearthing human remains.	<p>The 404(b)(1) Guidelines (40 CFR 230) are specific to the consideration of proposed discharges of dredged or fill material under the CWA and are not associated with National Environmental Policy Act (NEPA) regulations that require environmental analyses such as the ADOT/FHWA FEIS. In this case, it is the Corps' responsibility to determine if the action complies with the Guidelines. ADOT submitted their application in November 2016 when the level of design for the project was sufficient for the Corps to determine if the proposed discharges were compliant with the Guidelines.</p> <p>Regarding compliance with other environmental regulations, the Corps as a federal agency is also responsible for ensuring that compliance occurs on actions within its jurisdiction and authority. This includes such laws as the National Historic Preservation Act and the Native American Religious Freedoms Act. In order to meet the responsibilities under these laws, a PA has been developed and executed. The Corps is a concurring party to this agreement, which designates FHWA to act as lead federal agency for the purposes of compliance. The PA and associated historic properties treatment plan were reviewed by Corps' archaeologists and describes the process for proper treatment and management of affected resources, outlines the specific actions and their responsible parties, and includes the ongoing consultation requirements.</p>
56	Public Notice	E-mail	Beth Gagnon	Individual	3	The project will result in unacceptable air quality impacts in the Ahwatukee area.	Please see response above for Unknown, GRIC GOV Comment 12.
57	Public Notice	E-mail	Beth Gagnon	Individual	4	The project will eliminate 3 of the Community's water wells.	Please see response above for Richard Militello Comment 6.
58	Public Notice	E-mail	Beth Gagnon	Individual	5	The project will impact South Mountain, desecrating culturally significant trails, shrines, and archaeological sites.	Please see response above for Leigh Kuwanwisiwma, Hopi comments 1 and 2.
59	Public Notice	E-mail	Beth Gagnon	Individual	6	There are too many environmental, health, and safety issues that have not been considered or adequately addressed.	The Corps conducted a public interest review per 33 CFR 320.4(a), which is included in the Corps' SIR, with findings made in the ROD. The reasonably expected benefits and detriments of the project were evaluated based on the public interest factors. While there are detriments associated with the proposed project, the benefits outweigh those detriments and the project was found to be not contrary to the public interest. The Corps is a cooperating agency for the ADOT/FHWA FEIS and has determined that issues were adequately analyzed.
60	Public Notice	E-mail	Beth Gagnon	Individual	7	A freeway along Pecos Road is no longer appropriate due to	Please see response for the GRIC GOV Comment 16. The Corps participated in the development of alternatives for consideration in the

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						changes in land use that have occurred adjacent to Pecos Road.	ADOT/FHWA FEIS, as well as analyzed design alternatives in the 404(b)(1) analysis that minimize or avoid impacts to WUS.
61	Public Notice	E-mail	Beth Gagnon	Individual	8	The project will negatively affect property values along Pecos Road.	Please see response above to Richard Militello Comment 4.
62	Public Notice	E-mail	Beth Gagnon	Individual	9	The project will cause unacceptable noise, pollution, and traffic impacts, and traffic on the freeway will consist mostly of commercial trucks.	Please see response above for Richard Militello Comments 1, 2 and 3.
63	Public Notice	E-mail	Beth Gagnon	Individual	10	The costs of the project both in dollars and impacts outweigh the benefits as it will only save one minute from the daily commute travel time.	Please see response to Beth Gagnon, comment 6. According the purpose and need statement in the FEIS and restated in Section III of the Corps' ROD, the freeway was proposed to meet other needs other than commute time. The project is also needed to meet existing and future demand, and add additional capacity to the regional transportation system. The freeway was identified as the best way to address these needs.
64	Public Notice	E-mail	Beth Gagnon	Individual	11	Opposes project.	Please see response above for Unknown, GRIC GOV Comment 23.
65	Public Notice	E-mail	Beth Gagnon	Individual	12	ADOT did not consider environmental or traffic impacts to Ahwatukee.	Please see response above for Beth Gagnon, comment 6.
66	Public Notice	Phone	Anonymous (Phone)	Individual	1	The government and its officials are racist against Native Americans.	Comment noted.
67	Public Notice	Phone	Anonymous (Phone)	Individual	2	Human remains have been unearthed and many more will be unearthed over the course of construction.	Please see response above for Beth Gagnon, comment 2.
68	Public Notice	Phone	Anonymous (Phone)	Individual	3	Unsafe trucks from Mexico will use the freeway, which will cause air pollution.	Please see response above for Unknown, GRIC GOV Comment 12.
69	Public Notice	Phone	Anonymous (Phone)	Individual	4	The project will impact ground water wells and an HOA lake.	Please see response above for Richard Militello Comment 6. There are no lakes within the Corps' jurisdiction, and approval or denial of the Section 404 permit would not have an impact on the homeowners association (HOA) lake.
70	Public Notice	Letter	David Sulouff	US Coast Guard	1	The USCG has determined the project does not require USCG involvement for bridge permit purposes.	Comment noted.

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71	Public Notice	E-mail	Lori Fisher	Individual	1	The City of Phoenix allowed inappropriate development adjacent to the proposed freeway, which should have stopped the project from being built.	Comment noted.
72	Public Notice	E-mail	Lori Fisher	Individual	2	The freeway should be depressed like most other portions of SR 202L, this should be mandatory.	Please see response above for Richard Militello Comment 8.
73	Public Notice	E-mail	Lori Fisher	Individual	3	The project will have unacceptable air quality impacts to children in adjacent elementary schools.	Please see response above for Unknown, GRIC GOV Comment 12.
74	Public Notice	E-mail	Lori Fisher	Individual	4	Impacts to South Mountain Park are illegal.	Please see response above for Beth Gagnon, comment 2, and Unknown, GRIC GOV Comment 3.
75	Public Notice	E-mail	Lori Fisher	Individual	5	The absence of a 32nd Street Traffic Interchange will cause unacceptable traffic impacts.	See comment response to Beth Gagnon, Individual Comment 1.
76	Public Notice	E-mail	Lori Fisher	Individual	6	ADOT has not acted on/implemented any public input.	As documented in the ADOT/FHWA FEIS, Volume 1, page 6-26 addresses how the public has influenced the project.
77	Public Hearing	Timed Speaker	Governor Lewis	GRIC GOV	1	Requests that the Corps deny ADOT's permit application.	Please see response above for Unknown, GRIC GOV Comment 23.
78	Public Hearing	Timed Speaker	Governor Lewis	GRIC GOV	2	The Corps must consider the direct and indirect impacts on the Community.	Please see response above for Unknown, GRIC GOV Comment 1.
79	Public Hearing	Timed Speaker	Governor Lewis	GRIC GOV	3	ADOT has not properly evaluated other location alternatives, including alternatives north of the South Mountains that would have fewer impacts on WUS and would not impact the South Mountains.	As documented in the FHWA ROD Appendix A, page A26, Several alternatives were subject to the alternatives development and screening process, not just the E1 Alternative and alternatives located on the Gila River Indian Community (Figure 3-6 on page 3-10 of the Final Environmental Impact Statement illustrates such alternatives). An analysis of avoidance alternatives was completed in accordance with Section 4(f) of the Department of Transportation Act of 1966. FHWA's analysis for the Selected Alternative found that there is no prudent and feasible alternative to using the South Mountains and that the project includes all possible planning to minimize harm to the resource resulting from the use. The Corps also evaluated alternatives that would have avoided the impacts to the South Mountains for compliance with the 404(b)(1) guidelines. Specifically, the Corps considered an alternative north of the mountains that would have crossed the Salt River at one of three locations. While this alternative would result in fewer impacts to WUS, it would not achieve the

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							overall project purpose identified in the 404(b)(1) analysis and would result in significant environmental impacts in the South Mountain Village.
80	Public Hearing	Timed Speaker	Governor Lewis	GRIC GOV	4	ADOT has not shown that the proposed project is the Least Environmentally Damaging Practicable Alternative.	Please see response above for Unknown, GRIC GOV Comment 1.
81	Public Hearing	Timed Speaker	Governor Lewis	GRIC GOV	5	Issuing the permit is not in the public interest.	Please see response above for Unknown, GRIC GOV Comment 2.
82	Public Hearing	Timed Speaker	Governor Lewis	GRIC GOV	6	Issuing the permit will allow the project to impact the South Mountains, which are sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
83	Public Hearing	Timed Speaker	Governor Lewis	GRIC GOV	7	The freeway could bring contaminated water to Community land and cause flooding.	Please see response above for Unknown, GRIC GOV Comment 4 and 5.
84	Public Hearing	Timed Speaker	Governor Lewis	GRIC GOV	8	Requests that the Corps deny ADOT's permit application.	Please see response above for Unknown, GRIC GOV Comment 23.
85	Public Hearing	Timed Speaker	Governor Lewis	GRIC GOV	9	Opposes the Corps issuing a permit for the project.	Please see response above for Unknown, GRIC GOV Comment 23.
86	Public Hearing	Timed Speaker	Anthony Villareal	GRIC GOV	10	The Corps cannot rely on the ADOT/FHWA EIS to grant a CWA permit because the Corps must conduct additional analyses and findings under the Clean Water Act regulations, including evaluating impacts to the Community, historic, and cultural resources such as the South Mountains.	Please see response above for Unknown, GRIC GOV Comment 1.
87	Public Hearing	Timed Speaker	Anthony Villareal	GRIC GOV	11	The Project will impact South Mountain, which is sacred to the Community and is a Traditional Cultural Property.	Please see response above for Unknown, GRIC GOV Comment 3.
88	Public Hearing	Timed Speaker	Charles Goldtooth	GRIC GOV	12	The project will have impacts to Community lands that the law requires the Corps to consider in its decision whether to issue a permit.	Please see response above for Unknown, GRIC GOV Comment 4.

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89	Public Hearing	Timed Speaker	Charles Goldtooth	GRIC GOV	13	The project will impact water quality of flows entering the Community.	Please see response above for Unknown, GRIC GOV Comment 5.
90	Public Hearing	Timed Speaker	Charles Goldtooth	GRIC GOV	14	The project could impact the Pee Posh Wetlands.	Please see response above for Unknown, GRIC GOV Comment 6.
91	Public Hearing	Timed Speaker	Charles Goldtooth	GRIC GOV	15	The project will cause downstream flooding on the Community, particularly at Komatke and the Vee Quiva Casino, and will also likely require the Community to modify its Komatke Area Drainage Master Study (ADMS), which will increase the ADMS cost.	please see response above for Unknown, GRIC GOV Comment 10
92	Public Hearing	Timed Speaker	Charles Goldtooth	GRIC GOV	16	ADOT has not properly evaluated other location alternatives, including alternatives north of the South Mountains that would have fewer impacts on WUS and would not impact the South Mountains.	Please see response above for Governor Lewis, GRIC GOV Comment 3.
93	Public Hearing	Timed Speaker	Charles Goldtooth	GRIC GOV	17	Requests that comments be considered.	As a part of the 404 individual permit evaluation process, a public notice soliciting comments was published and extended. In addition, a public hearing was held to collect comments. All comments were considered by the Corps.
94	Public Hearing	Timed Speaker	Charles Goldtooth	GRIC GOV	18	There will be irreparable harm if the permit is issued, thus the permit should not be issued, if at all, until after the Ninth Circuit Court has ruled.	Please see response above for Unknown, GRIC GOV Comment 23.
95	Public Hearing	Timed Speaker	Steve Brittle	PARC	19	Questions why the South Mountain Freeway project 404 permit seems accelerated.	The Corps has been a cooperating agency on the ADOT/FHWA FEIS since the EIS process began in 2001. Impacts to WUS and measures to avoid, minimize, or mitigate any such impacts have been a concern throughout the EIS process. The actual 404 permit processing time for this project is consistent with timeframes normally experienced for an individual permit, which is the type of 404 permit required for a project of this type and size and is the type of permit ADOT applied for.
96	Public Hearing	Timed Speaker	Steve Brittle	PARC	20	Questions whether the freeway was designed specifically to profit sand and gravel mining	Comment noted. The applicant responded that the project was not designed to profit sand and gravel mining companies. As stated by the applicant, soil removal would occur within the Salt River to construct the northern and

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
						companies and whether removal of soil from the Salt River banks will occur.	southern abatements, guide banks, scour protection, and the drilled shafts that support the bridge piers. Within WUS, removal of material would be needed to construct the drilled shafts, and scour protection. In addition, temporary removal of material would be needed to construct the northern abutment, but it would be replaced after construction is completed.
97	Public Hearing	Timed Speaker	Steve Brittle	PARC	21	The project has only completed preliminary design, which violates NEPA and lacks the detail necessary to determine impacts and mitigation requirements.	Please see response above for Unknown, GRIC GOV Comment 21. FHWA and ADOT have conducted subsequent ADOT/FHWA FEIS reevaluations as design has been completed. These reevaluations have determined that a supplemental ADOT/FHWA FEIS was not warranted and the Selected Alternative and its related impacts would not significantly change as a result of the modifications that have occurred since the ADOT/FHWA FEIS was issued.
98	Public Hearing	Timed Speaker	Steve Brittle	PARC	22	The ADOT/FHWA EIS did not properly analyze cumulative impacts in part because the project has only completed preliminary design. The Corps is continuing this pattern of vagueness and inadequate analysis by not disclosing the actual impacts and associated mitigation; therefore, the permit is too vague, a moving target, and illegal.	The Corps has analyzed the actual impacts of the project, as documented in the Corps' ROD and the 404(b)(1) analysis. The applicant will provide compensatory mitigation for all permanent impacts to WUS. Secondary and cumulative impacts are provided and discussed in the ADOT/ FHWA Draft Environmental Impact Statement (DEIS) Volume I, Chapter 4 (Secondary and Cumulative Impacts), Pages 4-167 through 4-177; and in FEIS Volume I, Chapter 4 (Secondary and Cumulative Impacts), Pages 4-179 through 4-189. The Corps also considered cumulative impacts to the aquatic environment in Section 5.5 of the 404(b)(1) analysis.
99	Public Hearing	Timed Speaker	Steve Brittle	PARC	23	The 404-permit process should be halted and re-noticed when the actual proposed mitigation plans are fully disclosed because the public notice admits irreparable harm would occur, proper mitigation hasn't been identified, and in-lieu fees are inadequate.	Please see response above for Melissa Scianni, EPA Comment 2. The requirement for in-lieu fees are appropriate for the project based on 2008 Mitigation Rule, codified at 33 CFR Part 332, as documented by the Corps in its 404(b)(1) analysis.
100	Public Hearing	Timed Speaker	Steve Brittle	PARC	24	The C202P have exhibited a failure to take proper care of natural resources.	The applicant's response, FHWA ROD Volume I, Table 3 (Commitments and Mitigation Measures) Pages 38 through 47 contains 58 commitments and/or mitigation measures regarding natural resources (Water Resources, Floodplains, WUS, and Biological Resources). The responsibility for some of these measures has been retained by ADOT, while the responsibility for others has been delegated to the developer (C202P). Those that are the responsibility of the developer are included in C202P's contract and are binding requirements.

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101	Public Hearing	Timed Speaker	Steve Brittle	PARC	25	Questions what the possible hazardous wastes or materials are that will be uncovered or generated and how they will be handled.	The Corps' 404(b)(1) and ROD address the hazardous material in dredge and/or fill material. Dredged or fill material must be free from hazardous waste and the SWPPP also address pollutants. As part of the ADOT/FHWA EIS process, a hazardous materials evaluation for the construction and operation of the proposed freeway was conducted. Hazardous materials and measures to avoid, minimize, or mitigate impacts are provided and discussed throughout the ADOT/FHWA FEIS, most notably in the following locations: ADOT/ FHWA DEIS Volume I, Chapter 4 (Affected Environment, Environmental Consequences, and Mitigation), Pages 4-152 through 4-154 (Hazardous Materials) ADOT/FHWA FEIS Volume I, Chapter 4 (Affected Environment, Environmental Consequences, and Mitigation), Pages 4-164 through 4-166 (Hazardous Materials) FHWA ROD Volume I, Page 23, Table 2 (Environmental Factors Accounted for in the Decision); and Page 44, Table 3 (Commitments and Mitigation Measures)
102	Public Hearing	Timed Speaker	Steve Brittle	PARC	26	Questions how on-site drainage will be treated before being discharged into WUS and questions the validity of the project's drainage design because the draft ADOT drainage manual was issued in 2015 and hasn't been updated.	Please see response above for Unknown, GRIC GOV Comment 5 and 11.
103	Public Hearing	Timed Speaker	Barnaby Lewis	GRIC GOV	27	Issuing the permit will allow the project to impact the South Mountains, which are sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
104	Public Hearing	Timed Speaker	Barnaby Lewis	GRIC GOV	28	Requests that the Corps deny the permit so that ADOT can locate the freeway elsewhere.	Please see response above for Unknown, GRIC GOV Comment 23.
105	Public Hearing	Timed Speaker	Seaver Fields	GRIC GOV	29	The project may increase peak discharge, velocity, and water surface elevation of drainage along certain segments of the Pecos Road alignment.	Please see response above for Unknown, GRIC GOV Comment 11.
106	Public Hearing	Timed Speaker	Seaver Fields	GRIC GOV	30	The project will result in contamination of runoff to Community lands because on-site	Please see response above for Unknown, GRIC GOV Comment 5.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
						drainage could comingle with off-site drainage.	
107	Public Hearing	Timed Speaker	Seaver Fields	GRIC GOV	31	The Community will provide additional and more detailed comments on drainage data once the Center Segment is received.	Please see response above for Unknown, GRIC GOV Comment 9.
108	Public Hearing	Timed Speaker	Seaver Fields	GRIC GOV	32	The freeway will be an obstruction to flow and could concentrate sheet flow to a point of increasing discharge volume entering the Community.	Please see response above for Unknown, GRIC GOV Comment 11.
109	Public Hearing	Timed Speaker	Seaver Fields	GRIC GOV	33	Should the Corps decide to issue the permit, proper flood mitigation should be considered.	please see response above for Unknown, GRIC GOV Comment 11
110	Public Hearing	Timed Speaker	Elizabeth Goff	PMPC	34	The project will have substantial direct, indirect, and cumulative impacts to environment and recreational purposes, uses, and values of the South Mountain Park/Preserve	The Corps has analyzed the impacts of the project, as documented in the Corps' ROD and the 404(b)(1) analysis. Measures to minimize harm to SMPP, including the provision of replacement lands, would reduce impacts to the lowest level possible and would ensure that active recreational areas within SMPP would not be affected. The following relevant response can be found in the FHWA ROD Volume I, Responses to Frequently Submitted Public Comments Page 56, Issue: Section 4(f) and 6(f), SMPP
111	Public Hearing	Timed Speaker	Elizabeth Goff	PMPC	35	Issuing the permit will result in impacts to natural washes that will disrupt wildlife movement corridors.	ADOT has included wildlife crossings (five multi-use overpasses and two small-animal crossings) in the freeway design based on coordination with the ADOT, Community, AZGFD, and consultant biologists based on current agency guidelines to mitigate those impacts.
112	Public Hearing	Timed Speaker	Elizabeth Goff	PMPC	36	Mitigation of the Salt River crossing must consider access to recreational areas upstream and downstream, including Tres Rios and the Rio Salado de Oeste (RSO) project.	Mitigation measures have been developed to minimize impacts on aquatic resources, as described in the ADOT/FHWA FEIS, 404(b)(1) analysis, the ROD's prepared by FHWA and the Corps. The Corps considered the SMF's potential impacts on the RSO project since the restoration project is a reasonably foreseeable action which may be indirectly impacted by the freeway. The Salt River crossing will not impact access to recreational areas and will accommodate the future RSO project.

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113	Public Hearing	Timed Speaker	Elizabeth Goff	PMPC	37	It is unclear how the impacts of the project will be mitigated.	The Corps permit will require compensatory mitigation for permanent impacts to WUS and has included special conditions that also mitigate impacts. Section 7 of the 404(b)(1) analysis discusses how the mitigation was determined. In addition to this, the ADOT/FHWA FEIS has thoroughly identified mitigation for environmental impacts and is discussed throughout the document. Specifically, FHWA ROD Volume I, Table 3 (Commitments and Mitigation Measures) Pages 38 through 47 provides 138 mitigations measures and other commitments to avoid, minimize, and/or mitigate impacts, including 22 measures for WUS alone. These measures have either already been implemented, are currently being implemented, or will be implemented, depending on the timing of the measure relative to a specific stage of design or construction.
114	Public Hearing	Timed Speaker	Elizabeth Goff	PMPC	38	ADOT has not been transparent with mitigation plans or design for the project.	The applicant and C202P have provided information to the public and the Community through public outreach, stakeholder meetings, and consultation meetings as discussed in the applicant's response and the response above for Charles Goldtooth Comment 17.
115	Public Hearing	Timed Speaker	Elizabeth Goff	PMPC	39	Requests that the Corps deny the permit because it is not in the public interest and there are less environmentally harmful yet feasible alternatives that have not been adequately explored by ADOT.	Please see response above for Unknown, GRIC GOV Comment 1 and Governor Lewis Comment 3.
116	Public Hearing	Timed Speaker	Elizabeth Goff	PMPC	40	A supplemental EIS is required because the 404(b)(1) Guidelines were not used during the ADOT/FHWA EIS process, including the alternatives evaluation.	Please see response above for Beth Gagnon Comment 2.
117	Public Hearing	Timed Speaker	Elizabeth Goff	PMPC	41	The project is not in the public interest because the benefits of the project area outweighed by the probable impacts.	Please see response above for Unknown, GRIC GOV Comment 2.
118	Public Hearing	Timed Speaker	Elizabeth Goff	PMPC	42	The Corps has failed to adequately disclose mitigation for the project.	Please see response above for Melissa Scianni, EPA Comment 2.
119	Public Hearing		Elizabeth Goff	PMPC	43	The Selected Alternative is not the Least Environmentally Damaging Practicable Alternative (LEDPA).	Please see response above for Unknown, GRIC GOV Comment 1.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
120	Public Hearing	Timed Speaker	Dale Gutenson	GRIC GOV	44	The project may result in downstream drainage impacts to the Community, specifically at the Vee Quiva Casino.	Please see response above for Unknown, GRIC GOV Comment 10.
121	Public Hearing	Timed Speaker	Dale Gutenson	GRIC GOV	45	Requests that the Community be given the opportunity to review and approve plans due to potential downstream drainage impacts to the Community.	Please see response above for Unknown, GRIC GOV Comment 11.
122	Public Hearing	Timed Speaker	Tiffany Spargue	Sierra Club	46	The project would increase runoff to the Salt and Gila Rivers and forever impair an already impaired section of the Salt River per Section 303(d) of the CWA.	Please see response above for Unknown, GRIC GOV Comment 5.
123	Public Hearing	Timed Speaker	Tiffany Spargue	Sierra Club	47	The project would degrade several ephemeral washes near the South Mountains and cross several jurisdictional waters in the western section.	Please see response above for Unknown, GRIC GOV Comment 1.
124	Public Hearing	Timed Speaker	Tiffany Spargue	Sierra Club	48	Measures to avoid, minimize, or mitigate impacts to water quality have been vague.	Please see response above for Unknown, GRIC GOV Comment 5.
125	Public Hearing	Timed Speaker	Tiffany Spargue	Sierra Club	49	ADOT has been vague in disclosing potential impacts and proposed mitigation, which prevents the Corps from making an informed decision.	Please see response above for Steve Brittle, PARC Comment 22.
126	Public Hearing	Timed Speaker	Tiffany Spargue	Sierra Club	50	Encourages the Corps to deny the permit because ADOT has failed to avoid and minimize the project impacts, adequately address mitigation, and failed to address negative and cumulative impacts to WUS.	Please see response above for Unknown, GRIC GOV Comment 1.
127	Public Hearing	Timed Speaker	Kayla Devault	Individual	51	Disagrees with current regulatory framework of the CWA in the US.	Comment noted.
128	Public Hearing	Timed Speaker	Kayla Devault	Individual	52	The project has potential downstream impacts to the Community.	Please see response above for Unknown, GRIC GOV Comment 4, 5, and 10.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
129	Public Hearing	Timed Speaker	Kayla Devault	Individual	53	The project will impact the South Mountains, which are sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
130	Public Hearing	Timed Speaker	Kayla Devault	Individual	54	The project will impact WUS by restricting them to drainage structures.	Please see response below for Fred Ringlero Jr., GRIC Comment 87.
131	Public Hearing	Timed Speaker	Kayla Devault	Individual	55	Questions the definition of water quality because the project will result in permanent impact to WUS.	Please see response above for Unknown, GRIC GOV Comment 5.
132	Public Hearing	Timed Speaker	Kayla Devault	Individual	56	The project is not justified.	Comment noted.
133	Public Hearing	Timed Speaker	Kayla Devault	Individual	57	ADOT should not have begun construction before the permit has been issued.	An applicant for a Section 404 CWA permit may begin construction activities provided there is no discharge of dredged and/or fill material into WUS and provided that the activities do not preclude other alternatives.
134	Public Hearing	Timed Speaker	Kayla Devault	Individual	58	ADOT should not have begun construction before there was an approved consultation and consent by the Community.	Comment noted.
135	Public Hearing	Timed Speaker	Kayla Devault	Individual	59	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
136	Public Hearing	Timed Speaker	Napoleon Marrietta	GRIC	60	The project will impact the South Mountains, which are sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
137	Public Hearing	Timed Speaker	Napoleon Marrietta	GRIC	61	The project will impact WUS, and water is sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
138	Public Hearing	Timed Speaker	Napoleon Marrietta	GRIC	62	Opposes the project and issuance of the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
139	Public Hearing	Timed Speaker	Napoleon Marrietta	GRIC	63	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
140	Public Hearing	Timed Speaker	Jana Sunn	GRIC	64	The project will divert natural runoff and cause tragic and unforeseen impacts to the Community, including impacts to water quality.	Please see response above for Unknown, GRIC GOV Comment 5.
141	Public Hearing	Timed Speaker	Jana Sunn	GRIC	65	The project will impact the South Mountains, which are sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
142	Public Hearing	Timed Speaker	Jana Sunn	GRIC	66	The project will direct runoff to the Community and cause	Please see response above for Unknown, GRIC GOV Comment 5.

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						downstream water quality impacts to the Community.	
143	Public Hearing	Timed Speaker	Jana Sunn	GRIC	67	The Community was not taken into consideration.	Please see response above Charles Goldtooth, GRIC GOV, Comment 17.
144	Public Hearing	Timed Speaker	Jana Sunn	GRIC	68	Environmental concerns for the project are wetlands, cultural values, recreation, fish and wildlife, flood hazards, land use, water supply, water quality, and safety and welfare of the people.	Please see response above for Unknown, GRIC GOV Comments 1 and 19. Please see response above for Beth Gagnon, Comments 6.
145	Public Hearing	Timed Speaker	Lorraine Yaramata	GRIC	69	The project will cause noise and pollution and may increase crime.	Please see response above for Richard Militello Comments 1, 2 and 3.
146	Public Hearing	Timed Speaker	Lorraine Yaramata	GRIC	70	The project will impact wildlife.	Please see response above, Elizabeth Goff, PMPC Comment 35.
147	Public Hearing	Timed Speaker	Lorraine Yaramata	GRIC	71	It is upsetting not to be aware of the Selected Alternative.	Please see response above Charles Goldtooth, GRIC GOV, Comment 17.
148	Public Hearing	Timed Speaker	Lorraine Yaramata	GRIC	72	Opposes the Selected Alternative.	Comment noted.
149	Public Hearing	Timed Speaker	Aaron Sabori	GRIC	73	The project could have downstream drainage and flooding impacts on the Community.	Please see response below for Fred Ringlero Jr., GRIC Comment 87.
150	Public Hearing	Timed Speaker	Aaron Sabori	GRIC	74	The project could have downstream water quality impacts on the Community.	Please see response above for Unknown, GRIC GOV Comment 5.
151	Public Hearing	Timed Speaker	Aaron Sabori	GRIC	75	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
152	Public Hearing	Timed Speaker	Bruce Lindquist	Individual	76	Questions what levels of flood intensity is the project designed for?	Per the applicant response the proposed design uses the existing conditions analysis as the basis for the proposed design. Along Pecos Road, the current drainage design accepts runoff from north of the right-of-way and conveys the runoff to proposed culverts. The culverts are designed for the 50-year discharge and checked against the 100-year discharge, in accordance with the project technical provisions. As a result, the proposed culvert design cannot cause an increase in the 100-year discharge water surface elevation at or upstream of the upstream right-of-way.
153	Public Hearing	Timed Speaker	Bruce Lindquist	Individual	77	The project will have downstream water quality impacts and should incorporate some level of treatment.	Please see response above for Unknown, GRIC GOV Comment 5.
154	Public Hearing	Timed Speaker	Bruce Lindquist	Individual	78	Questions how hazardous materials such as arsenic will be	Please see response above for Steve Brittle, PARC Comment 25.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
						treated if encountered during construction.	
155	Public Hearing	Timed Speaker	Bruce Lindquist	Individual	79	Questions what will be done to protect cut slopes from erosion.	Please see response above for Richard Militello Comment 2.
156	Public Hearing	Timed Speaker	Bruce Lindquist	Individual	80	The City of Phoenix does not have the right to transfer title of park/preserve land to ADOT.	This comment is not within the Corps' scope of analysis or area of expertise.
157	Public Hearing	Timed Speaker	Tupac Enrique	GRIC	81	Opposes project.	Please see response above for Unknown, GRIC GOV Comment 23.
158	Public Hearing	Timed Speaker	Tupac Enrique	GRIC	82	The project is not consistent with the United Nations Declaration on the Rights of Indigenous Peoples Article 18, and violates Article 32.	<p>The comment is referring to the UN Declaration on the Rights of Indigenous Peoples (Declaration), which was adopted by the UN General Assembly in September 2007. The specific articles of the Declaration identified by the commenter are discussed below as they relate to the project.</p> <p>Article 18 of the Declaration states: Indigenous peoples have the right to participate in decision-making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own indigenous decision-making institutions.</p> <p>The project has not impacted the Community's right under the Declaration to maintain and develop their own decision-making institutions. Additionally, the Community has participated in the project decision-making process through representatives chosen by the Community in accordance with the Community's procedures as described below. Chapter 2 in the ADOT/FHWA FEIS is dedicated to coordination efforts with the Community. ADOT and FHWA, as leads for the project, have striven to be mindful and respectful of Community protocols and perspectives and worked to engage the Community throughout the ADOT/FHWA EIS process. For example, over 100 meetings were held with the Community from 2001 to 2009 alone. These meetings included discussion of topics including, but not limited to:</p> <ul style="list-style-type: none"> • Procedural requirements and Community protocols • the possibilities of studying alternatives on Community land • Community concerns regarding impacts from the proposed action on and off Community land <p>The Community has also participated in the Corps' decision process through government-to-government consultation requests. The Corps considered comments provided by the Community and has met twice with</p>

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							<p>elected officials to discuss their concerns regarding the project. As a result of these interactions, the Corps made a request to ADOT and C202P to consider the comments of the Community related to drainage and flooding concerns. As a result, modification to the structures proposed in WUS occurred and were submitted to the Corps in October 2017.</p> <p>Article 32 of the Declaration states:</p> <ol style="list-style-type: none">1. Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources.2. States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.3. States shall provide effective mechanisms for just and fair redress for any such activities, and appropriate measures shall be taken to mitigate adverse environmental, economic, social, cultural or spiritual impact. <p>The project has not impacted the Community’s right under the Declaration to determine and develop strategies for the development or use of their lands or territories and other resources. In addition, as described above in the discussion regarding Article 18 of the declaration, ADOT/FHWA has consulted and cooperated in good faith with the Community through the Community’s own representative institutions prior to approving the proposed action, and continues to engage with the Community’s representative institutions.</p> <p>The South Mountain Freeway does not occur on Community land or territories, the project will not directly impact Community land or territories. However, the Corps recognizes the project’s potential indirect impacts to the Community, as addressed in the FEIS and the 404(b)(1) analysis. ADOT, FHWA and the Corps also recognize the direct and indirect impacts the project will have to cultural resources that are located outside of the Community’s lands, but hold value to the Community, such as archaeological sites and the South Mountain TCP. Indirect impacts to cultural resources are also extensively addressed in the FEIS. However, as also provided in the FHWA ROD, ADOT/FHWA have taken appropriate measures to avoid, minimize, and/or mitigate the project’s potential adverse impacts, both direct and indirect, on the Community. A programmatic</p>

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							agreement has also been developed and implemented to mitigate impacts to the archaeological sites and the TCP. The Corps has signed this agreement as a concurring party, which designates FHWA to act on behalf of the Corps.
159	Public Hearing	Timed Speaker	Mike Tashquinth	GRIC	83	Issuing the permit will allow the project to impact the South Mountains, which are sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
160	Public Hearing	Timed Speaker	Mike Tashquinth	GRIC	84	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
161	Public Hearing	Timed Speaker	Mike Tashquinth	GRIC	85	The ADOT/FHWA EIS does not consider the Community.	Comment noted.
162	Public Hearing	Timed Speaker	Mike Tashquinth	GRIC	86	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
163	Public Hearing	Timed Speaker	Fred Ringlero Jr.	GRIC	87	The project may have downstream drainage, flooding, and water quality impacts to the Community.	Please see response to Unknown, GRIC GOV Comment 8. In addition, the existing crossings along the Pecos Segment will be replaced with larger, properly sized crossings that can convey the 50-year flow event. As stated by the applicant, the project has been designed to minimize impacts to drainage patterns. The applicant has coordinated with the City of Phoenix and the FCDMC, who have both reviewed and signed the CLOMR, which has been submitted to FEMA. The applicant has included design features to treat runoff prior to discharge into WUS. In addition, the applicant has received a Section 401 Water Quality Certification and a MS4 permit from the ADEQ, which manages water quality under Section 401 and 402 of the CWA.
164	Public Hearing	Timed Speaker	Fred Ringlero Jr.	GRIC	88	Opposes issuing the permit until the issues described in Comment #87 can be evaluated.	Please see response above for Unknown, GRIC GOV Comment 23.
165	Public Hearing	Timed Speaker	Fred Ringlero Jr.	GRIC	89	Recommends that some Community members be included in a construction inspection program.	Comment noted. The applicant has committed to continue to consult with the Community on the project, and will consider the request. .
166	Public Hearing	Timed Speaker	Lori Thomas-Riddle	GRIC	90	The public hearing did not allow people to express their views with signs.	Please see response above for Richard Militello, Comment 5.
167	Public Hearing	Timed Speaker	Lori Thomas-Riddle	GRIC	91	The project will impact the South Mountains, which are sacred to the Community and used for religious purposes.	Please see response above for Unknown, GRIC GOV Comment 3.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
168	Public Hearing	Timed Speaker	Lori Thomas-Riddle	GRIC	92	People won't be allowed to cross the freeway to the South Mountains, which will deny them access to an area of religious importance.	Please see response above for Unknown, GRIC GOV Comment 3.
169	Public Hearing	Timed Speaker	Lori Thomas-Riddle	GRIC	93	The freeway is unnecessary.	In the ADOT/FHWA ROD Volume I, page 55, it states that decisions regarding freeway projects are based on a comprehensive, multimodal, regional approach. Nearly half of the projected population increases in the metropolitan area will be served by the freeway and a need for the project has been identified. Local governments have made planning decisions based on the presence of the freeway. Finally the Corps found the project to not be contrary to the public interest.
170	Public Hearing	Timed Speaker	Lori Thomas-Riddle	GRIC	94	The project would result in pollution which could have health effects, especially to children.	Please see response above for Richard Militello, Comment 3.
171	Public Hearing	Timed Speaker	Lori Thomas-Riddle	GRIC	95	Consultation with the Community is not sincere communication.	Comment noted.
172	Public Hearing	Timed Speaker	Lori Thomas-Riddle	GRIC	96	The freeway doesn't belong here.	Comment noted.
173	Public Hearing	Timed Speaker	Lori Thomas-Riddle	GRIC	97	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
174	Public Hearing	Timed Speaker	Reverend Joe Tate	GRIC	98	Opposes issuance of the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
175	Public Hearing	Timed Speaker	Chris Morago	GRIC	99	The public hearing did not allow people to express their views with signs.	Please see response above for Richard Militello, Comment 5.
176	Public Hearing	Timed Speaker	Chris Morago	GRIC	100	The project will cause downstream water quality impacts to the Community.	Please see response above for Unknown, GRIC GOV Comment 5.
177	Public Hearing	Timed Speaker	Chris Morago	GRIC	101	The project would result in pollution which could have health effects, especially to children.	Please see response above for Richard Militello, Comment 3.
178	Public Hearing	Timed Speaker	Chris Morago	GRIC	102	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
179	Public Hearing	Timed Speaker	Suree Towfighnia	GRIC	103	The project will have downstream drainage and water quality impacts to the Community.	Please see response above for Unknown, GRIC GOV Comment 5.
180	Public Hearing	Timed Speaker	Suree Towfighnia	GRIC	104	The project will impact aquatic resources on the Community, and	Please see response above for Unknown, GRIC GOV Comment 7.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
						may impact Salt River restoration efforts.	
181	Public Hearing	Timed Speaker	Suree Towfighnia	GRIC	105	Requests that the Corps deny the permit because ADOT has failed to provide drainage plans.	Please see response above for Unknown, GRIC GOV Comment 11 and 23.
182	Public Hearing	Timed Speaker	Suree Towfighnia	GRIC	106	The project will impact the South Mountains, which are sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
183	Public Hearing	Timed Speaker	Suree Towfighnia	GRIC	107	Questions whether the freeway will impact drainage such that plants south of the freeway will no longer receive water.	Connectivity between the South Mountains and Sierra Estrella will remain the same as drainage will enter and exit the right-of-way in their existing channels.
184	Public Hearing	Timed Speaker	Suree Towfighnia	GRIC	108	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
185	Public Hearing	Timed Speaker	Amanda Blackhorse	Navajo Nation	109	The freeway should not be built due to the opposition expressed at the public hearing.	Comment noted.
186	Public Hearing	Timed Speaker	Amanda Blackhorse	Navajo Nation	110	The project will impact water resources, health, will increase pollution, and may cause social issues such as increased crime.	Please see response above for Unknown, GRIC GOV Comment 1.
187	Public Hearing	Timed Speaker	Amanda Blackhorse	Navajo Nation	111	Asks that potential impacts to health be considered in the decision to issue the permit.	Please see response above for Richard Militello, Comment 3.
188	Public Hearing	Timed Speaker	Amanda Blackhorse	Navajo Nation	112	Questions how Community members will be able to cross the freeway to access the South Mountains.	Please see response above for Unknown, GRIC GOV Comment 3.
189	Public Hearing	Timed Speaker	Elizabeth Francisco	GRIC	113	The project will impact the South Mountains, which are sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
190	Public Hearing	Timed Speaker	Elizabeth Francisco	GRIC	114	The project will have downstream drainage and water quality impacts to the Community and its' water resources.	Please see response above for Unknown, GRIC GOV Comment 5.
191	Public Hearing	Timed Speaker	Elizabeth Francisco	GRIC	115	The project will impact health, particularly children's health.	Please see response above for Richard Militello, Comment 3.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
192	Public Hearing	Timed Speaker	Darius Enos	GRIC	116	The project will have downstream water quality impacts to the Community and its' water resources.	Please see response above for Unknown, GRIC GOV Comment 5.
193	Public Hearing	Timed Speaker	Darius Enos	GRIC	117	The project may have downstream drainage and flooding impacts to the Community.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
194	Public Hearing	Timed Speaker	Darius Enos	GRIC	118	Seems to question whether the project would impact climate change and air quality.	Please see response above for Unknown, GRIC GOV Comment 12.
195	Public Hearing	Timed Speaker	Darius Enos	GRIC	119	Seems to question whether the project would have health impacts and requests that it be considered.	Please see response above for Richard Militello, Comment 3.
196	Public Hearing	Timed Speaker	Antonio Sneed	GRIC	120	See written comment form for Mr. Antonio Sneed in the "Responses to Written Comments Provided at the Public Hearing by Individuals" section below.	Comment noted.
197	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	1	The project will have substantial direct, indirect, and cumulative impacts to environment and recreational purposes, uses, and values of the South Mountain Park/Preserve	Please see response above Elizabeth Goff, PMPC, Comment 34.
198	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	2	Issuing the permit will result in impacts to natural washes that will disrupt wildlife movement corridors.	Please see response above, Elizabeth Goff, PMPC Comment 35.
199	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	3	Mitigation of the Salt River crossing must consider access to recreational areas upstream and downstream, including Tres Rios and the Rio Salado Oeste project.	Please see response above Elizabeth Goff, PMPC, Comment 36.
200	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	4	It is unclear how the impacts of the project will be mitigated.	Please see response above Elizabeth Goff, PMPC, Comment 37.
201	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	5	ADOT has not been transparent with mitigation plans or design for the project.	Please see response above Elizabeth Goff, PMPC, Comment 38, and Charles Goldtooth, GRIC GOV, Comment 17.

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202	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	6	Requests that the Corps deny the permit because it is not in the public interest and there are less environmentally harmful yet feasible alternatives that have not been adequately explored by ADOT.	Please see response above for Unknown, GRIC GOV Comment 2 and Governor Lewis, GRIC GOV Comment 3.
203	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	7	A supplemental EIS is required because the 404(b)(1) Guidelines were not used during the ADOT/FHWA EIS process, including the alternatives evaluation.	Please see response above for Beth Gagnon Comment 2.
204	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	8	The project is not in the public interest because the benefits of the project area outweighed by the probably impacts.	Please see response above for Unknown, GRIC GOV Comment 2.
205	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	9	The Corps has failed to adequately disclose mitigation for the project.	Please see response above for Melissa Scianni, EPA Comment 2.
206	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	10	The Selected Alternative is not the Least Environmentally Damaging Practicable Alternative (LEDPA).	Please see response above for Unknown, GRIC GOV Comment 1.
207	Public Hearing	Untimed Speaker	Elizabeth Goff	PMPC	11	A supplemental EIS is required because the 404(b)(1) Guidelines were not used during the ADOT/FHWA EIS process, including the alternatives evaluation.	Please see response above for Beth Gagnon Comment 2.
208	Public Hearing	Untimed Speaker	Aaron Sabori	GRIC	12	The permit should be denied, or at least a special condition should be included that requires Community approval by vote of the project design because the project will have downstream impacts to the community.	Please see response above for Unknown, GRIC GOV Comment 23.
209	Public Hearing	Untimed Speaker	Aaron Sabori	GRIC	13	The project will result in downstream water quality impacts to the Community.	Please see response above for Unknown, GRIC GOV Comment 5.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
210	Public Hearing	Untimed Speaker	Steve Brittle	PARC	14	Questions what the possible hazardous wastes or materials are that will be uncovered or generated and how they will be handled.	Please see response above for Steve Brittle, PARC Comment 25.
211	Public Hearing	Untimed Speaker	Steve Brittle	PARC	15	Questions how on-site drainage will be treated before being discharged into WUS and questions the validity of the project's drainage design because the draft ADOT drainage manual was issued in 2015 and hasn't been updated.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
212	Public Hearing	Untimed Speaker	Steve Brittle	PARC	16	Questions the adequacy of the project drainage design because there have been flood events along the existing Pecos Road.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
213	Public Hearing	Untimed Speaker	Steve Brittle	PARC	17	Questions whether the freeway drainage design between 24th Street and 28th Place will be able to handle off-site drainage because the existing Pecos Road culverts at the wash east of 27th Place are inadequate.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
214	Public Hearing	Untimed Speaker	Steve Brittle	PARC	18	There is not enough information regarding impacts and mitigation for the proposed permit.	Please see response for Melissa Scianni, EPA Comment 2
215	Public Hearing	Untimed Speaker	Pliny Draper	Individual	19	The project will have visual impacts.	Please see response above to Richard Militello Comment 2.
216	Public Hearing	Untimed Speaker	Pliny Draper	Individual	20	The project will negatively impact property values.	Please see response above to Richard Militello Comment 4.
217	Public Hearing	Untimed Speaker	Pliny Draper	Individual	21	The project will disproportionately impact people on the south side of the South Mountains.	Comment noted.
218	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	1	There will be irreparable harm if the permit is issued, thus the permit should not be issued, if at all, until after the Ninth Circuit Court has ruled.	Please see response above for Unknown, GRIC GOV Comment 23.

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219	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	2	Questions why the South Mountain Freeway project 404 permit seems accelerated.	Please see response above for Steve Brittle, PARC Comment 19.
220	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	3	Questions whether the freeway was designed specifically to profit sand and gravel mining companies and whether removal of soil from the Salt River banks will occur.	Please see response above for Steve Brittle, PARC Comment 20.
221	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	4	The project has only completed preliminary design, which violates NEPA and lacks the detail necessary to determine impacts and mitigation requirements.	Please see response above for Melissa Scianni, EPA Comment 2.
222	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	5	The ADOT/FHWA EIS did not properly analyze cumulative impacts in part because the project has only completed preliminary design. The Corps is continuing this pattern of vagueness and inadequate analysis by not disclosing the actual impacts and associated mitigation; therefore, the permit is too vague, a moving target, and illegal.	Please see response above for Steve Brittle, PARC Comment 22.
223	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	6	The 404 permit process should be halted and re-noticed when the actual proposed mitigation plans are fully disclosed because the public notice admits irreparable harm would occur, proper mitigation hasn't been identified, and in-lie fees are inadequate.	Please see response above for Melissa Scianni, EPA Comment 2.
224	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	7	The C202P have exhibited a failure to take proper care of natural resources.	Please see response above for Steve Brittle, PARC Comment 24.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
225	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	8	Questions what the possible hazardous wastes or materials are that will be uncovered or generated and how they will be handled.	Please see response above for Steve Brittle, PARC Comment 25.
226	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	9	Questions how on-site drainage will be treated before being discharged into WUS and questions the validity of the project's drainage design because the draft ADOT drainage manual was issued in 2015 and hasn't been updated.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
227	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	10	Questions the adequacy of the project drainage design because there have been flood events along the existing Pecos Road.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
228	Public Hearing	Written at Hearing by Groups	Steve Brittle	PARC	11	Questions whether the freeway drainage design between 24 th Street and 28 th Place will be able to handle off-site drainage because the existing Pecos Road culverts at the wash east of 27 th Place are inadequate.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
229	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	1	The project will have substantial direct, indirect, and cumulative impacts to environment and recreational purposes, uses, and values of the South Mountain Park/Preserve.	Please see response above Elizabeth Goff, PMPC, Comment 34.
230	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	2	Issuing the permit will result in impacts to natural washes that will disrupt wildlife movement corridors.	Please see response above, Elizabeth Goff, PMPC Comment 35.
231	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	3	Mitigation of the Salt River crossing must consider access to recreational areas upstream and downstream, including Tres Rios and the Rio Salado Oeste project.	Please see response above Elizabeth Goff, PMPC, Comment 36.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
232	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	4	It is unclear how the impacts of the project will be mitigated.	Please see response above Elizabeth Goff, PMPC, Comment 37.
233	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	5	ADOT has not been transparent with mitigation plans or design for the project.	Please see response above Charles Goldtooth, GRIC GOV, Comment 17.
234	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	6	Requests that the Corps deny the permit because it is not in the public interest and there are less environmentally harmful yet feasible alternatives that have not been adequately explored by ADOT.	Please see response above for Unknown, GRIC GOV Comment 1 and Governor Lewis Comment 3.
235	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	7	A supplemental EIS is required because the 404(b)(1) Guidelines were not used during the ADOT/FHWA EIS process, including the alternatives evaluation.	Please see response above for Beth Gagnon Comment 2.
236	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	8	The project is not in the public interest because the benefits of the project area outweighed by the probably impacts.	Please see response above for Unknown, GRIC GOV Comment 2.
237	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	9	The Corps has failed to adequately disclose mitigation for the project.	Please see response above for Melissa Scianni, EPA Comment 2.
238	Public Hearing	Written at Hearing by Groups	Elizabeth Goff	PMPC	10	The Selected Alternative is not the Least Environmentally Damaging Practicable Alternative (LEDPA).	Please see response above for Unknown, GRIC GOV Comment 1.
239	Public Hearing	Written at Hearing by Individuals	Luis Durazo	GRIC	1	Questions what ADOT is constructing in the valley between the two South Mountain ridges.	The comment appears to be referring to the Taylor Morrison residential development currently being constructed between the two ridgelines at the southwestern end of the South Mountains. This is not related to the South Mountain Freeway project.
240	Public Hearing	Written at Hearing by Individuals	Luis Durazo	GRIC	2	Questions whether a proposed ramp will be permanent.	The comment appears to be referring to an access road to the Taylor Morrison residential development, which is not related to the South Mountain Freeway.
241	Public Hearing	Written at Hearing by Individuals	Luis Durazo	GRIC	3	Questions how many cuts there will be to the South Mountains.	The freeway will cut through the two ridgelines at the southwestern end of the South Mountains.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
242	Public Hearing	Written at Hearing by Individuals	Luis Durazo	GRIC	4	The comment appears to be questioning the source of water that will be used for construction, such as for dust control.	As stated by the applicant, most of the water used for construction will come from the Salt River Project irrigation system; though some water used for construction may come from outside wells and/or the City of Phoenix.
243	Public Hearing	Written at Hearing by Individuals	Luis Durazo	GRIC	5	The comment appears to be questioning where run-off from freeway pavement will go.	Please see response above for Unknown, GRIC GOV Comment 5.
244	Public Hearing	Written at Hearing by Individuals	Felicita Mendoza	Individual	6	Supports the project.	Comment noted.
245	Public Hearing	Written at Hearing by Individuals	Fred Ringlero Jr.	Individual	7	The project may have downstream drainage impacts to the Community.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
246	Public Hearing	Written at Hearing by Individuals	Aaron Sabori	GRIC	8	The permit should be denied, or at least a special condition should be included that requires Community approval by vote of the project design because the project will have downstream impacts to the Community.	Please see response above for Unknown, GRIC GOV Comment 23.
247	Public Hearing	Written at Hearing by Individuals	Aaron Sabori	GRIC	9	The project will result in downstream drainage, flooding, and water quality impacts to the Community.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
248	Public Hearing	Written at Hearing by Individuals	Antonio Sneed	GRIC	10	The commenter is a deaf Community member that was using a Native Sign Language and not American Sign Language. Due to the absence of certified Native Sign Language interpreters, the following contextual interpretation has been provided by a professional and certified American Sign Language interpreter. The comment is as follows: "I've come in protest of the development of the Loop 202 highway in our area. The unrest in the native reservation needs to	Comment noted.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
						stop. Our Mother Earth is concerned with possible toxins added to the natural water reserves, gas leaks and the unnatural changes to the unearthing of land. Thank you for giving me an opportunity to speak. Thank you.”	
249	Public Hearing	Written at Hearing by Individuals	Mike Tashquinth	GRIC	N/A	No Comment on page.	Noted.
250	Public Hearing	Written at Hearing by Individuals	Harry Williams Jr	Individual	11	Questions what protection will be provided for cultural resources during construction.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
251	Public Hearing	Written at Hearing by Individuals	Harry Williams, Jr	Individual	12	Questions whether construction crews will be made aware of the sensitivity of cultural resource discoveries.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
252	Public Hearing	Written at Hearing by Individuals	Harry Williams Jr.	Individual	13	Questions whether the Community’s Cultural Resources Management Program will be consulted should cultural resources be encountered during construction.	Please see response above for Leigh Kuwanwisiwma, Hopi comment 2.
253	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	1	The Corps must supplement the ADOT/FHWA EIS or prepare a new NEPA study.	Please see response above for Unknown, GRIC GOV Comment 1.
254	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	2	The ADOT/FHWA EIS does not adequately identify and evaluate a range of reasonable alternative to issuing a Section 404 permit along the Pecos Road alignment.	Please see response above for Unknown, GRIC GOV Comment 1 and Governor Lewis, GRIC GOV Comment 3.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
255	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	3	The ADOT/FHWA EIS does not identify impacts to WUS along Pecos Road or measures to mitigate such impacts.	Impacts to WUS and measures to mitigate those impacts, including those along Pecos Road, are provided and discussed throughout the ADOT/FHWA FEIS, most notably in the following locations: <ul style="list-style-type: none"> • ADOT/FHWA FEIS Volume I, Chapter 3 (Alternatives), Page 3-27 Compliance with Section 404(b)(1) Guidelines) • ADOT/FHWA FEIS Volume I, Chapter 4 (Affected Environment, Environmental Consequences, and Mitigation), Pages 4-116 through 4-120 (Waters of the United States) • ADOT/FHWA's ROD Volume I, Page 22, Table 2 (Environmental Factors Accounted for in the Decision); Pages 41 through 42, Table 3 (Commitments and Mitigation Measures); and Page 59 (CWA Subsection under the Environmentally Preferable Alternative Section) <p>Potential direct and indirect impacts to WUS and measures to mitigate those impacts are considered in the Corps' 404(b)(1) analysis.</p>
256	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	4	The Corps must supplement the ADOT/FHWA EIS or prepare a new NEPA study.	Please see response above for Unknown, GRIC GOV Comment 1.
257	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	5	The ADOT/FHWA EIS does not identify a range of reasonable alternatives to issuing the permit.	Please see response above for Governor Lewis, GRIC GOV Comment 3.
258	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	6	It is unclear whether the Corps independently evaluated alternatives that were located north of South Mountain, and if so, what went into the Corps' "independent evaluation".	Please see response above for Unknown, GRIC GOV Comment 1.
259	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	7	The ADOT/FHWA EIS does not indicate, and it is Unknown if the Corps considered, whether alternatives north of South Mountain would avoid WUS or impact fewer WUS than the proposed alignment.	Please see response above for Unknown, GRIC GOV Comment 1.
260	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	8	The ADOT/FHWA EIS does not indicate that alternatives north of South Mountain fail to meet the project's purpose and need, have adverse environmental impacts, are cost prohibitive, or are	Please see response above for Unknown, GRIC GOV Comment 1.

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						otherwise unfeasible, thus a new or supplemental NEPA study is needed to address this.	
261	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	9	The ADOT/FHWA EIS fails to address the direct and indirect impacts of WUS crossings, only providing a hollow commitment that ADOT will try not to change wash locations and will coordinate with the Community, which was not even included in the ADOT/FHWA EIS.	Please see response for Unknown, GRIC GOV Comment 1.
262	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	10	The Corps confirmed in the public hearing that WUS crossings were not designed during the ADOT/FHWA EIS process. This lack of details regarding impacts to WUS demonstrates that the ADOT/FHWA EIS is not adequate to fulfill the Corps' NEPA obligations; therefore, a supplemental EIS or new NEPA study is required.	Please see response above for Unknown, GRIC GOV Comment 1.
263	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	11	The ADOT/FHWA EIS fails to include the required discussion of mitigation for potential flooding and drainage impacts resulting from impacts to WUS, which is another reason why the Corps cannot simply adopt the ADOT/FHWA EIS.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
264	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	12	The Corps should not rely on an EIS that is being litigated in Federal court and should either deny the permit, wait for the Ninth Circuit Court ruling to make the decision whether to issue the permit, or include a	Please see response above for Unknown, GRIC GOV Comment 23.

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						special condition prohibiting work within WUS until the Ninth Circuit Court has found that the ADOT/FHWA EIS is legally sufficient and valid.	
265	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	13	A drainage/flooding analysis is necessary. Although the Community has received drainage data for the Pecos Segment, the full set of drainage data is needed for the Community and the Corps to fully assess project impacts on the Community.	Please see response for Unknown, GRIC GOV Comment 11.
266	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	14	A significant number of the proposed culverts in the Pecos Segment will result in increased downstream discharge, water surface elevation, and velocity.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
267	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	15	The drainage data received for the Pecos Segment suggests that on-site drainage will comingle with off-site drainage, which could cause pollutants to enter washes that discharge onto Community lands.	Please see response for Unknown, GRIC GOV Comment 5.
268	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	16	ADOT should have utilized a 2-dimensional model to properly evaluate potential pre-project vs. post project drainage and flooding impacts.	Please see response for Unknown, GRIC GOV Comment 9.
269	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	17	The Community will further supplement its comments in the context of the Corps' permitting decision based on new drainage data received.	Please see response for Unknown, GRIC GOV Comment 11.
270	Public Hearing	After Hearing	Ian Shavitz	GRIC GOV	18	The Community requests that the Corps deny the Section 404 permit application for the Pecos and Center segments.	Please see response above for Unknown, GRIC GOV Comment 23.

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271	Public Hearing	After Hearing	Tupak Huehucoyotl	Action Network	1	The project is in violation of the United Nations Declaration on the Rights of Indigenous Peoples.	Please see response above for Tupac Enrique, GRIC Comment 82.
272	Public Hearing	After Hearing	Tupak Huehucoyotl	Action Network	2	Requests that the Corps deny the permit on the basis that the project is in violation of the United Nations Declaration on the Rights of Indigenous Peoples and 677 people signed a petition denying consent to the project.	Please see response above for Tupac Enrique, GRIC Comment 82.
273	Public Hearing	After Hearing	Patrick McMullen	PMPC	1	Requests the Corps deny the permit and lists reasons the permit should be denied.	Please see response above for Unknown, GRIC GOV Comment 23.
274	Public Hearing	After Hearing	Patrick McMullen	PMPC	2	Reserves the right to submit additional comments to any supplemental materials or new information.	Comment noted.
275	Public Hearing	After Hearing	Patrick McMullen	PMPC	3	The Corps must perform additional NEPA analysis because ADOT/FHWA did not follow the 404(b)(1) guidelines and the ADOT/FHWA EIS is invalid.	Please see response above for Beth Gagnon Comment 2.
276	Public Hearing	After Hearing	Patrick McMullen	PMPC	4	The Corps' additional NEPA analysis must go further than merely examining the project's impacts to WUS.	Please see response above for Unknown, GRIC GOV Comment 1.
277	Public Hearing	After Hearing	Patrick McMullen	PMPC	5	The Corps has an independent obligation to ensure that its NEPA analysis takes a hard look at the direct, indirect, and cumulative impacts of the entire South Mountain Freeway project.	Please see response above for Unknown, GRIC GOV Comment 1.
278	Public Hearing	After Hearing	Patrick McMullen	PMPC	6	Because the Corps has an independent obligation under NEPA to analyze all of the project's impacts, PMPC's comments on the ADOT/FHWA FEIS are incorporated in full.	Please see response above for Unknown, GRIC GOV Comment 1.

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279	Public Hearing	After Hearing	Patrick McMullen	PMPC	7	If the Corps relies solely on the ADOT/FHWA EIS in its decision to issue the permit, the Corps will be in violation of NEPA because the ADOT/FHWA EIS failed to take a “hard look” at the project.	Please see response above for Unknown, GRIC GOV Comment 1.
280	Public Hearing	After Hearing	Patrick McMullen	PMPC	8	The Section 404(b)(1) guidelines were not used during the ADOT/FHWA EIS and the Corps received the application 2 years after ROD issuance, which undermines the public involvement mandate of NEPA that requires the Corps to have detailed information on significant environmental impacts when it make sits decisions.	Please see response above for Beth Gagnon Comment 2.
281	Public Hearing	After Hearing	Patrick McMullen	PMPC	9	The Corps has violated NEPA by allowing construction to proceed before completing its own NEPA process and other obligations.	An applicant for a Section 404 CWA permit may begin construction activities provided there is no discharge of dredged and/or fill material into WUS and provided that the activities do not preclude other alternatives.
282	Public Hearing	After Hearing	Patrick McMullen	PMPC	10	The Corps should place the project on hold pending NEPA compliance, or if the Corps decides to issue the permit, it should include a special condition prohibiting work (at least within WUS) until the Ninth Circuit Court has found that the ADOT/FHWA EIS is legally sufficient and valid.	Please see response above for Unknown, GRIC GOV Comment 1.
283	Public Hearing	After Hearing	Patrick McMullen	PMPC	11	Issuance of the 404 permit is not in the public interest because the detriments outweigh the benefits.	Please see response above for Unknown, GRIC GOV Comment 2.
284	Public Hearing	After Hearing	Patrick McMullen	PMPC	12	The project will have significant detrimental effects to a myriad of aspects in the surrounding environment, which must be weighed by the Corps.	Please see response above for Unknown, GRIC GOV Comment 1.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
285	Public Hearing	After Hearing	Patrick McMullen	PMPC	13	The project could result in significant impacts to aquatic resources on Community land and decrease water quality on the Community.	Please see response above for Unknown, GRIC GOV Comment 5.
286	Public Hearing	After Hearing	Patrick McMullen	PMPC	14	The ADOT/FHWA Selected Alternative is not the Least Environmentally Damaging Practicable Alternative (LEDPA). Specifically, the ADOT/FHWA EIS failed to demonstrate that the E1 alternative is the LEDPA and the Corps should evaluate alternatives that would avoid South Mountain.	Please see response above for Unknown, GRIC GOV Comment 1.
287	Public Hearing	After Hearing	Patrick McMullen	PMPC	15	The Corps lacks sufficient information on mitigation to comply with EPA Guidelines and therefore the permit should be denied.	Please see response above for Melissa Scianni, EPA Comment 2.
288	Public Hearing	After Hearing	Patrick McMullen	PMPC	16	ADOT did not adequately analyze alternatives in order for the Corps to independently conclude that impacts to water of the US to the greatest extent possible. Specifically, the FEIS did not evaluate alternatives north of South Mountain in enough detail to determine whether those alternatives would impact fewer acres of WUS.	Please see response above for Unknown, GRIC GOV Comment 1.
289	Public Hearing	After Hearing	Patrick McMullen	PMPC	17	ADOT has not been transparent with mitigation plans or design for the project and is literally designing the project as it is being built.	Regarding mitigation, specifically for impacts to WUS, ADOT originally proposed to provide compensatory mitigation in the form of in-lieu fees at a 1:1 ratio (1 acre replaced for every 1 acre permanently impacted) for those crossings where impacts exceeded 0.5 acre. This mitigation is identified on Page 9 of the December 2016 Corps public notice. This December 2016 public notice was included with the Corps April 4, 2017 notice announcing the public hearing. Both notices are available on the Corps' website. However, ADOT has since revised its proposal to provide compensatory mitigation in the form of in-lieu fees at a 1:1 ratio for all permanent impacts

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							to WUS. This mitigation proposal complies with 33 CFR Part 332 Compensatory Mitigation for Losses of Aquatic Resources.
290	Public Hearing	After Hearing	Patrick McMullen	PMPC	18	The ADOT/FHWA FEIS mitigation measures are vague and “punt” the specifics of mitigation to the future.	As explained in the applicant's response to comments, mitigation for environmental impacts are thoroughly identified and discussed throughout the ADOT/FHWA FEIS. Specifically, in FHWA's ROD Volume I, Table 3 (Commitments and Mitigation Measures) Pages 38 through 47 provides 138 mitigations measures and other commitments to avoid, minimize, and/or mitigate impacts. The responsibility for some of these measures has been retained by ADOT, while the responsibility for others has been delegated to the developer (C202P). Those that are the responsibility of the developer are included in C202P’s contract and are binding requirements.
291	Public Hearing	After Hearing	Patrick McMullen	PMPC	19	Opposes issuance of the 404 permit, requests that the Corps deny the permit, and summarizes reasons the permit should be denied.	Please see response above for Unknown, GRIC GOV Comment 23.
292	Public Hearing	After Hearing	Patrick McMullen	PMPC	20	Parkland cannot be taken for transportation purposes unless there is no other reasonable or prudent alternative, and there are reasonable alternatives in the flatlands near South Mountain Park/Preserve.	While the use of park land is relevant to the public interest review, there is no prohibition on the use of these lands. This comment appears to reference Section 4(f) requirements, which is specific to FHWA's regulations.
293	Public Hearing	After Hearing	Sandy Bahr	Sierra Club	1	The project will have significant direct, indirect, and cumulative impacts on the environment and public health.	Please see response above for Unknown, GRIC GOV Comment 1.
294	Public Hearing	After Hearing	Sandy Bahr	Sierra Club	2	Requests that the Corps deny the 404 permit because mitigation is unclear and the impacts of the project can’t be mitigated.	Please see response above for Melissa Scianni, EPA Comment 2.
295	Public Hearing	After Hearing	Sandy Bahr	Sierra Club	3	ADOT/FHWA could have identified feasible alternatives that are less environmentally harmful, but selected the	Please see response above for Governor Lewis, GRIC GOV Comment 3.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
						alternative that creates significant harm.	
296	Public Hearing	After Hearing	Sandy Bahr	Sierra Club	4	The Section 404(b)(1) guidelines (Guidelines) were not used in the ADOT/FHWA EIS and ADOT has failed to demonstrate that the Selected Alternative is the Least Environmentally Damaging Practicable Alternative (LEDPA); therefore, the Corps should evaluate alternatives that avoid South Mountain to determine whether they are practicable per the Guidelines.	Please see response above for Beth Gagnon Comment 2.
297	Public Hearing	After Hearing	Sandy Bahr	Sierra Club	5	Issuing the permit is not in the public interest because the project detriments outweigh the benefits.	Please see response above for Unknown, GRIC GOV Comment 2.
298	Public Hearing	After Hearing	Sandy Bahr	Sierra Club	6	The Corps must prepare a supplemental EIS for the project because the Corps did not utilize the Section 404(b)(1) guidelines during the ADOT/FHWA EIS process. This supplemental EIS should evaluate the full range of alternatives and develop mitigation scenarios.	Please see response above for Beth Gagnon Comment 2.
299	Public Hearing	After Hearing	Sandy Bahr	Sierra Club	7	Requests that Sierra Club's comments on the ADOT/ FHWA DEIS and FEIS be incorporated into the record and that they be considered as reasoning to deny ADOT's 404 permit application and to develop a supplemental EIS.	Please see response above for Unknown, GRIC GOV Comment 23.
300	Public Hearing	After Hearing	Mike Abkin	Individual	1	The project is not consistent with the United Nations Declaration on the Rights of Indigenous Peoples.	Please see response above for Tupac Enrique, GRIC Comment 82.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
301	Public Hearing	After Hearing	Mike Abkin	Individual	2	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
302	Public Hearing	After Hearing	Tupac Enrique Acosta	Individual	3	The project is not consistent with the United Nations Declaration on the Rights of Indigenous Peoples.	Please see response above for Tupac Enrique, GRIC Comment 82.
303	Public Hearing	After Hearing	Patti Bailie	Individual	4	Opposes project and requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
304	Public Hearing	After Hearing	Patti Bailie	Individual	5	There is no need for the project.	As documented in the ADOT/FHWA FEIS, there is a need for the project. Of the projected 51 percent increase in population, 39 percent increase in housing units, and 69 percent increase in jobs between 2010 and 2035 in the Phoenix metropolitan area, nearly half of these increases are expected in areas that would be immediately served by the freeway (see ADOT/FHWA FEIS page 1-21). When ADOT determines whether a freeway should be built, the agency must consider numerous factors, including local and regional transportation needs, project costs, and environmental considerations. Decisions regarding freeway projects are based on the transportation needs of the entire Phoenix metropolitan area as part of a comprehensive, multimodal, regional approach. The South Mountain Freeway is a major component in the Regional Freeway and Highway System. Additionally, the freeway is an important component of past and current planning efforts. Maricopa County, Phoenix's villages (Laveen, Estrella, and Ahwatukee Foothills), Tolleson, and Avondale have all made transportation, land use, and economic planning decisions in a context of the freeway operating in the Study Area. Finally, the freeway will function as intended in the Regional Transportation Plan.
305	Public Hearing	After Hearing	Patti Bailie	Individual	6	The only alternative offered will impact the South Mountains, which are sacred to the Community.	Please see response above for GRIC GOV Comment 3.
306	Public Hearing	After Hearing	Patti Bailie	Individual	7	The project will result in downstream drainage, flooding, and water quality impacts.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
307	Public Hearing	After Hearing	Patti Bailie	Individual	8	Encourages genuine consultation and cultural sensitivity with indigenous communities.	Please see response above Charles Goldtooth, GRIC GOV, Comment 17.
308	Public Hearing	After Hearing	Rebecca Berry	Individual	9	Requests that the Corps deny the permit application.	Please see response above for Unknown, GRIC GOV Comment 23.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
309	Public Hearing	After Hearing	Sarah Clark	Individual	10	The ADOT/FHWA EIS did not comply with the Section 404(b)(1) Guidelines.	Please see response above for Beth Gagnon Comment 2.
310	Public Hearing	After Hearing	Sarah Clark	Individual	11	Expresses concern that the ADOT/FHWA EIS is insufficient for the Corps to accurately assess impacts to WUS, especially regarding local water shortages and potential downstream impacts to water quality.	Please see response above for Unknown, GRIC GOV Comment 5.
311	Public Hearing	After Hearing	Sarah Clark	Individual	12	Encourages consideration of the United Nations Declaration on the Rights of Indigenous Peoples, especially due to the project's impacts to the South Mountains, which are sacred to the Community.	Please see response above for Tupac Enrique, GRIC Comment 82.
312	Public Hearing	After Hearing	Sarah Clark	Individual	13	Encourages the Corps to fully weigh potential alternatives and mitigation strategies and consider the need and effectiveness of the project in addressing traffic congestion in the long run.	Please see response above for Unknown, GRIC GOV Comment 1 and Governor Lewis, GRIC GOV Comment 3.
313	Public Hearing	After Hearing	Melissa Crosby	Individual	14	Expresses concern that the project may move forward with little consideration regarding the impacts to the South Mountains, which are sacred to the Community.	Please see response above for Unknown, GRIC GOV Comment 3.
314	Public Hearing	After Hearing	Melissa Crosby	Individual	15	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
315	Public Hearing	After Hearing	Melissa Crosby	Individual	16	Expresses concern that decisions would be made without engaging the indigenous communities being impacted and approaching the project in a way that honors their perspective.	Please see response above Charles Goldtooth, GRIC GOV, Comment 17.
316	Public Hearing	After Hearing	Melissa Crosby	Individual	17	Urges the Corps to consider the long-term ramifications of the	Please see response above for Unknown, GRIC GOV Comment 1 and Governor Lewis, GRIC GOV Comment 3.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
						project beyond economic development.	
317	Public Hearing	After Hearing	Kayla Devault	Individual	18	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
318	Public Hearing	After Hearing	Kayla Devault	Individual	19	ADOT should not have begun construction because the Ninth Circuit Court has yet to rule on the appeal.	Please see response above for Patrick McMullen, PMPC Comment 9
319	Public Hearing	After Hearing	Kayla Devault	Individual	20	The project is not needed.	Comment noted.
320	Public Hearing	After Hearing	Kayla Devault	Individual	21	The project will make access to the Vee Quiva Casino more difficult and does not allow ingress and egress for Community members.	As documented in the ADOT/FHWA FEIS and the applicant's response to this comment, alternatives that considered alignments other than Pecos Road and non-freeway options such as arterial street improvements were considered. It was determined that non-freeway options would lack capacity to meet project transportation demands and did not meet the project's purpose and need. In addition, Community members supported a no-build option through a 2012 referendum, and no permission was granted by the Community to study alignment alternatives on their lands. To reduce impacts to residents and the South Mountains, the Pecos Road was found to be the only practicable action alternative in the Eastern Section of the Study Area.
321	Public Hearing	After Hearing	Kayla Devault	Individual	22	The ADOT/FHWA EIS did not adequately evaluate alternatives that would avoid the South Mountains.	Please see response above for Kayla Devault Comment 21, Richard Militello Comment 7, Unknown, GRIC GOV Comment 7 and Governor Lewis, GRIC GOV Comment 3.
322	Public Hearing	After Hearing	Kayla Devault	Individual	23	The project violates the United Nations Declaration on the Rights of Indigenous Peoples.	Please see response above for Tupac Enrique, GRIC Comment 82.
323	Public Hearing	After Hearing	Kayla Devault	Individual	24	The project will have downstream drainage, flooding, and water quality impacts to the Community.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
324	Public Hearing	After Hearing	Louis Ensel	Individual	25	The project will impact the South Mountains, which are sacred to the Community, and there is no need for the project.	Please see response above for Unknown, GRIC GOV Comment 3.
325	Public Hearing	After Hearing	Louis Ensel	Individual	26	An alternative that avoids the South Mountains should be designed.	Please see response above for Kayla Devault Comment 21, Richard Militello Comment 7, Unknown, GRIC GOV Comment 7 and Governor Lewis, GRIC GOV Comment 3.

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326	Public Hearing	After Hearing	Louis Ensel	Individual	27	The Corps should not allow ADOT to move forward until the Ninth Circuit Court has ruled.	Please see response above for Patrick McMullen, PMPC Comment 9
327	Public Hearing	After Hearing	Kristin Famula	Individual	28	The project is being pushed forward with disregard to the impacts on the South Mountains, which are sacred to the Community	Please see response above for Unknown, GRIC GOV Comment 3.
328	Public Hearing	After Hearing	Kristin Famula	Individual	29	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
329	Public Hearing	After Hearing	Julianna Gagnon	Individual	30	ADOT began construction while the case is still being disputed by the Ninth Circuit Court of Appeals and without the Section 404 permit.	An applicant for a Section 404 CWA permit may begin construction activities provided there is no discharge of dredged and/or fill material into WUS and provided that the activities do not preclude other alternatives.
330	Public Hearing	After Hearing	Julianna Gagnon	Individual	31	ADOT has not properly evaluated other location alternatives that would avoid the South Mountains.	Please see response above for Kayla Devault Comment 21, Richard Militello Comment 7, Unknown, GRIC GOV Comment 7 and Governor Lewis, GRIC GOV Comment 3.
331	Public Hearing	After Hearing	Julianna Gagnon	Individual	32	The project will result in downstream water quality impacts to the Community.	Please see response above for Unknown, GRIC GOV Comment 5.
332	Public Hearing	After Hearing	Julianna Gagnon	Individual	33	The freeway will not benefit the Community members impacted because it doesn't allow ingress or egress.	Please see response above for Kayla Devault Comment 21, Richard Militello Comment 7, Unknown, GRIC GOV Comment 7 and Governor Lewis, GRIC GOV Comment 3.
333	Public Hearing	After Hearing	Julianna Gagnon	Individual	34	The project violates the United Nations Declaration on the Rights of Indigenous Peoples.	Please see response above for Tupac Enrique, GRIC Comment 82.
334	Public Hearing	After Hearing	Julianna Gagnon	Individual	35	The project will result in downstream impacts to drainage, flooding, and water quality.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
335	Public Hearing	After Hearing	Julianna Gagnon	Individual	36	The comment appears to question the existence of a Stormwater Pollution Prevention Plan (SWPPP) for the project.	Please see response above for Unknown, GRIC GOV Comment 5.
336	Public Hearing	After Hearing	Julianna Gagnon	Individual	37	Requests that the Corp deny the permit and stop the construction.	Please see response above for Unknown, GRIC GOV Comment 23.
337	Public Hearing	After Hearing	Ariana Michelle Hill	Individual	38	Opposes project.	Please see response above for Unknown, GRIC GOV Comment 23.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
338	Public Hearing	After Hearing	Ariana Michelle Hill	Individual	39	The project is not in the public interest because the detriments outweigh the benefits.	Please see response above for Unknown, GRIC GOV Comment 2.
339	Public Hearing	After Hearing	Lisa Worth Huber	Individual	40	Requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
340	Public Hearing	After Hearing	Lisa Worth Huber	Individual	41	The project will result in downstream flood and water quality impacts	Please see response above for Unknown, GRIC GOV Comment 4 and 5.
341	Public Hearing	After Hearing	Elizabeth Langbauer	Individual	42	Opposes project and requests that the Corps deny the permit.	Please see response above for Unknown, GRIC GOV Comment 23.
342	Public Hearing	After Hearing	Elizabeth Langbauer	Individual	43	The project is not in the public interest because the detriments outweigh the benefits.	Please see response above for Unknown, GRIC GOV Comment 2.
343	Public Hearing		Elizabeth Langbauer	Individual	44	Non-freeway alternatives should be considered.	During the development of alternatives for the ADOT/FHWA FEIS, FHWA and ADOT considered other modes of transportation in order to meet the purpose and need. Through that evaluation process, it was determined that non-freeway options would not entirely meet the projected transportation demand in the region.
344	Public Hearing	After Hearing	Ngan Pham	Individual	45	Opposes project.	Please see response above for Unknown, GRIC GOV Comment 23.
345	Public Hearing	After Hearing	Ngan Pham	Individual	46	The project will impact South Mountain, which is sacred to the Community, and will contaminate the minerals and water from South Mountain.	Please see response above for Unknown, GRIC GOV Comment 3.
346	Public Hearing	After Hearing	Ngan Pham	Individual	47	The project violates the United Nations Declaration on the Rights of Indigenous.	Please see response above for Tupac Enrique, GRIC Comment 82.
347	Public Hearing	After Hearing	Robin Salthouse	Individual	48	The project will result in impacts to drainage, flooding, and water quality.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
348	Public Hearing	After Hearing	Robin Salthouse	Individual	49	Requests that the permit be denied based on poor project design mitigation and the lack of the following best management practices by the US Environmental Protection Agency.	Please see response above for Melissa Scianni, EPA Comment 2

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349	Public Hearing	After Hearing	Robin Salthouse	Individual	50	ADOT is designing the project as it is being built and is working in waterways without a Section 404 permit.	Please see response above for Julianna Gagnon, Comment 30.
350	Public Hearing	After Hearing	Robin Salthouse	Individual	51	ADOT has not been transparent with mitigation plans or design for the project.	Please see response above Charles Goldtooth, GRIC GOV, Comment 17.
351	Public Hearing	After Hearing	Robin Salthouse	Individual	52	The project design has inadequate Non-Point Source mitigation and poor flood control mitigation.	Please see response above for Fred Ringlero Jr., GRIC Comment 87.
352	Public Hearing	After Hearing	Robin Salthouse	Individual	53	Neither the ADOT/FHWA FEIS nor current design information address using native species vs. invasive species for bioretention areas.	As documented in the applicant's response and described in the 404(b)(1) analysis, native vegetation that is adapted to the Sonoran Desert would be used. In addition, species required to be salvaged by Arizona native plant laws would be used within landscaped areas. No invasive or non-native species would be used per ADOT guidelines.
353	Public Hearing	After Hearing	Robin Salthouse	Individual	54	The project is being rushed through without proper attention to both the NEPA and CWA requirements.	Please see response above for Steve Brittle, PARC Comment 19.
354	Public Hearing	After Hearing	Multiple Petition Signers	Action Network Petition	1	References the Declaration and denies Consent to the South Mountain Loop 202 Freeway Project. Calls on the Corps to deny the permit application.	<p>The following response addresses the majority of the comments from the petition which are impacts to tribal lands, Traditional cultural properties and the potential effects on tribal lands from the freeway. The community members supported a no-build option through a 2012 referendum, and no permission was granted by the Community to study alignment alternatives on their lands. To reduce impacts to residents and the South Mountains, the Pecos Road was found to be the only practicable action alternative in the Eastern Section of the Study Area.</p> <p>Referring to the UN Declaration on the Rights of Indigenous Peoples (Declaration), which was adopted by the UN General Assembly in September 2007, the specific articles of the Declaration of concern are discussed below as they relate to the project.</p> <p>Article 18 of the Declaration states: Indigenous peoples have the right to participate in decision-making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own indigenous decision-making institutions.</p> <p>The project has not impacted the Community's right under the Declaration to maintain and develop their own decision-making institutions.</p>

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							<p>Additionally, the Community has participated in the project decision-making process through representatives chosen by the Community in accordance with the Community’s procedures as described below. Chapter 2 in the ADOT/FHWA FEIS is dedicated to coordination efforts with the Community. ADOT and FHWA, as leads for the project, have striven to be mindful and respectful of Community protocols and perspectives and worked to engage the Community throughout the EIS process. For example, over 100 meetings were held with the Community from 2001 to 2009 alone. These meetings included discussion of topics including, but not limited to:</p> <ul style="list-style-type: none">• Procedural requirements and Community protocols• the possibilities of studying alternatives on Community land• Community concerns regarding impacts from the proposed action on and off Community land <p>The Community has also participated in the Corps’ decision process through government-to-government consultation requests. The Corps considered comments provided by the Community and has met twice with elected officials to discuss their concerns regarding the project. As a result of these interactions, the Corps made a request to ADOT and C202P to consider the comments of the Community related to drainage and flooding concerns. As a result, ADOT/C202P provided the Community with drainage reports and other information to allow their review. In response to the comments received from the Community, modifications to the structures proposed in WUS occurred in the Center Segment and were submitted to the Corps in October 2017.</p> <p>Article 32 of the Declaration states:</p> <ol style="list-style-type: none">1. Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources.2. States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.3. States shall provide effective mechanisms for just and fair redress for any such activities, and appropriate measures shall be taken to mitigate adverse environmental, economic, social, cultural or spiritual impact.

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							<p>The project has not impacted the Community’s right under the Declaration to determine and develop strategies for the development or use of their lands or territories and other resources. In addition, as described above in the discussion regarding Article 18 of the declaration, ADOT/FHWA has consulted and cooperated in good faith with the Community through the Community’s own representative institutions prior to approving the proposed action, and continues to engage with the Community’s representative institutions.</p> <p>The South Mountain Freeway does not occur on Community land or territories, the project will not directly impact Community land or territories. However, the Corps recognizes the project’s potential indirect impacts to the Community, as addressed in the FEIS and the 404(b)(1) analysis. ADOT, FHWA and the Corps also recognize the direct and indirect impacts the project will have to cultural resources that are located outside of the Community’s lands, but hold value to the Community, such as archaeological sites and the South Mountain TCP. Indirect impacts to cultural resources are also extensively addressed in the FEIS. However, as also provided in the FHWA ROD, ADOT/FHWA have taken appropriate measures to avoid, minimize, and/or mitigate the project’s potential adverse impacts, both direct and indirect, on the Community. A programmatic agreement has also been developed and implemented to mitigate impacts to the archaeological sites and the TCP. The Corps has signed this agreement as a concurring party, which designates FHWA to act as the federal lead on behalf of the Corps.</p>

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355	Public Hearing	After Hearing	Anna Dewart	Action Network Petition	2	I don't live there, but I and my family and friends, as well as thousands of other US citizens and international tourists visit Arizona for its natural wonders. Please use good sense in preserving what you have!	Comment noted.
356	Public Hearing	After Hearing	Andy Gracyalny	Action Network Petition	3	There is no need to destroy this beautiful land that god created for us to enjoy....	Please see response to Lori Thomas-Riddle, GRIC Comment 93.

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357	Public Hearing	After Hearing	Norma Flores	Action Network Petition	4	Native Peoples do not seek to protect their homelands out of greed and for "prosperity." We only seek to preserve the land and its resources for our ancestors and future generations. The land is sacred to our peoples. Asphalt and carcinogens do not help the environment.	<p>As mentioned in the ADOT/FHWA FEIS, 404(b)(1) analysis, and the public interest review, the project will result in impacts to the South Mountain TCP. However, the project will not prohibit ongoing access or cultural and religious practices by Native American Tribes. As stated in the FEIS and the applicant's response to comments, avoidance alternatives were evaluated and mitigation measures developed to minimize harm and ensure that Community members are able to access the South Mountains TCP. A programmatic agreement, which designates the FHWA as the lead federal agency for Section 106, has been developed and implemented. This agreement includes stipulations to mitigate impacts to cultural resources and commits ADOT and FWHA to fund a TCP enhancement and management plan, which would be prepared by the Community.</p> <p>The purpose of the 404(b)1 Guidelines are to restore and maintain the chemical, physical, and biological integrity of WUS through the control of discharges of dredges or fill material. Discharges may only be permitted under the Guidelines if the action if found to be the least environmentally damaging practicable alternative and is not contrary to the public interest. Complete preservation The Corp has analyzed the impacts and placed special conditions on the Section 404 permit to protect the public and minimize adverse impacts to the environment resulting from activities within its scope and authority related to WUS. Please refer to the Corps' ROD and 404(b)(1) analysis for details.</p> <p>ADOT/FHWA have also outlined several environmental commitments and mitigation measures to minimize impacts on the health, safety, and welfare of the public. As the lead Federal Agency, it is FHWA's responsibility to ensure that these are fully implemented.</p>
358	Public Hearing	After Hearing	AFRED Gonzales	Action Network Petition	5	In solidarity with the Gila River Indian Community and all Original Nations of Indigenous Peoples of the O'odham Jevd Territories	Comment noted.
359	Public Hearing	After Hearing	Dorothea Stevens	Action Network Petition	6	No to freeway - enough destruction to Indian country	Comment noted.

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360	Public Hearing	After Hearing	Alice Waenga	Action Network Petition	7	Kia kaha Evie.	Comment noted.
361	Public Hearing	After Hearing	Alicia Morales	Action Network Petition	8	A freeway going through south mountain goes against my freedom of religion. Keep it Sacred. Thank you!	Comment noted.
362	Public Hearing	After Hearing	Sylvia Kadlubowski	Action Network Petition	9	I wonder how expensive the property at the west end of this will be since construction was begun before all land was acquired? Not an uncommon timeline to use, but probably a poor choice with this one.	Comment noted.
363	Public Hearing	After Hearing	Christine Fidler	Action Network Petition	10	The time of reconciliation is upon us. We must respect the indigenous wishes in regard to this highway.	Comment noted.
364	Public Hearing	After Hearing	Yolanda Anguiano	Action Network Petition	11	Leave Indian Country alone!	Comment noted.

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365	Public Hearing	After Hearing	Danelle Spring	Action Network Petition	12	I am an enrolled member of the Gila River Indian Community. My family and I live in District Six. I believe the Army Corps of Engineers must take into consideration that this Loop 202 project NEVER studied the effects of the freeway pollution to our lands as ADOT was not given permission by the Community to do any such study. Knowing the topography of the area and the fact that the Gila River flowed from the east end of the community to our western region confirms that all of the pollution from the freeway WILL over time (as the freeway will fore-evermore be present until the end of vehicle traffic) seep into the earth and end up in our water supply that meets the Salt River. This project is unnecessary. The truckers already have a route to west phoenix. We all know the only reason they want to build this freeway is do that trucks carrying hazardous waste can get to west phoenix since they are not allowed through the I-10 tunnel.	Comment noted.
366	Public Hearing	After Hearing	Douglas Nelson	Action Network Petition	13	Bad for the environment coupled with an inadequate EIS. Bad for the community. A complete waste of money	Comment noted.

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367	Public Hearing	After Hearing	April Hall	Action Network Petition	14	It pains me a great deal that we continue to show little to no respect to the communities of Indigenous Peoples. We have no right to expand any project onto their territory. That is why I am signing this petition. To lend my voice to my allies.	Comment noted.

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368	Public Hearing	After Hearing	Danielle Petroniero-Klein	Action Network Petition	15	<p>This project is devastating to our community for so many reasons. In our area there are fungal spores that are airborne and cause Valley Fever. Construction in areas where children, adults and the elderly live is unwise and downright dangerous. A boy in our neighborhood died of Valley Fever, countless people in our area have it and my own husband has a disseminated kind called cocci meningitis and it is in his brain requiring multiple brain surgeries and is a lifelong disease to deal with. The dust that the trucks are creating is life-threatening for people with immune suppressed bodies and for people with asthma. Please I ask of you to make the safest choice for the people of our community and STOP this freeway. It is too close to homes, churches and our schools. We are also deeply saddened by having our sacred mountains destroyed for our Native Populations. How many ways can we go against our native people with no regard for their religion and cultural background? There are petroglyphs all over the area that my children and I see when we</p>	Comment noted.

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						<p>respectfully use the land to hike on to view the beauty of South Mountain. Even my youngest son of 10 has questioned why people would want to destroy such beauty and history.</p> <p>There is a chance to make this right by stopping this freeway which has been proven will not positively affect traffic flow for the people of the community or save them many minutes off their commute. Instead we are putting our community in harm's way and allowing a truck bypass to come through and destroy what we already have here in Ahwatukee. Thank you for listening.</p>	
369	Public Hearing	After Hearing	Elena Wolter	Action Network Petition	16	There are other options to build the freeway than the current plan. These options need to be investigated	Please see the response to Governor Lewis, GRIC GOV Comment #3.
370	Public Hearing	After Hearing	Erin McCarthy	Action Network Petition	17	Make the army corps work for us not for corporations	Comment noted.

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371	Public Hearing	After Hearing	Emily Sera	Action Network Petition	18	You've stolen our lands already. Enough is enough. Stop stealing.	Comment noted.
372	Public Hearing	After Hearing	Edwina Vogan	Action Network Petition	19	Respect the people and the land!	Comment noted.
373	Public Hearing	After Hearing	Ezra Garcia	Action Network Petition	20	Respect the wishes of the local tribes	Comment noted.
374	Public Hearing	After Hearing	Gee Mehta	Action Network Petition	21	Please Stop this freeway it's destroying homes and communities	Comment noted.
375	Public Hearing	After Hearing	Susan Hennessy	Action Network Petition	22	Enough with taking, and polluting, of sovereign land!! Indigenous people own it. I vehemently oppose the 202 expansion!	Comment noted.
376	Public Hearing	After Hearing	Janie Stein	Action Network Petition	23	Pay attention to the tribes and respect their decisions.	Comment noted.
377	Public Hearing	After Hearing	Israel Enrique	Action Network Petition	24	Defend the sacred	Comment noted.
378	Public Hearing	After Hearing	Jason Pinto	Action Network Petition	25	Anything to help preserve Mother Earth.	Comment noted.
379	Public Hearing	After Hearing	Jeanne Devine	Action Network Petition	26	I strongly support the Gila River Indian Community and many environmentalists in asking you to deny a permit allowing an invasion and destruction of South Mountain Park. As an NGO rep to the UN for Servas International, I also ask you to honor and respect UNDRIP.	See response to Elizabeth Goff, PMPC Comment #34 and Tupac Enrique, GRIC Comment #82.
380	Public Hearing	After Hearing	Jessica Travis	Action Network Petition	27	Honor the rights of Indigenous peoples!	Comment noted.

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381	Public Hearing	After Hearing	Candida Jose	Action Network Petition	28	Is taking most of my tribes identity at least leave us some of our culture left the mountain is a big part of our Legends which identify us as a people so yes I say no to the loop I got to thinking but this little plot of land that you left us on please let us have it	Comment noted.
382	Public Hearing	After Hearing	Joseph Larios	Action Network Petition	29	There has been inadequate planning around equitable engagement for the people who will be most adversely affected by this project	Comment noted.
383	Public Hearing	After Hearing	Julie Bekinnie	Action Network Petition	30	Protect our sacred mountain.	Comment noted
384	Public Hearing	After Hearing	Aaron Schofield	Action Network Petition	31	we don't need this	Comment noted.
385	Public Hearing	After Hearing	Abelardo Quezada	Action Network Petition	32	Noooooooooooooooooo. Stop it now. Always ruining indigenous sacred lands. Ugh	Comment noted.
386	Public Hearing	After Hearing	Laura Medina	Action Network Petition	33	When will Americans realize protecting the environment it vital for future generations.	Comment noted.
387	Public Hearing	After Hearing	Layla Ozdemir	Action Network Petition	34	My ancestral home hands off you greedy pigs you stole e ought , including my ancestors	Comment noted.
388	Public Hearing	After Hearing	Monique Crawford	Action Network Petition	35	No 202 loop on indigenous lands.	Comment noted.
389	Public Hearing	After Hearing	Elizabeth McLaren	Action Network Petition	36	Honor the request of the Original Nations of Indigenous Peoples	Comment noted.
390	Public Hearing	After Hearing	Lindsay Caglio	Action Network Petition	37	It is not okay to rob people of their land. We don't need more freeways.	Comment noted.

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391	Public Hearing	After Hearing	Lonnie Yazzie	Action Network Petition	38	Respect Native Lands	Comment noted.
392	Public Hearing	After Hearing	Marc Gunn	Action Network Petition	39	Respect the tribe's wishes.	Comment noted.
393	Public Hearing	After Hearing	Raquel Enrique	Action Network Petition	40	It's time to re-awaken the minds that corporation have continued to try and oppress through indoctrinating methods. Dismantle the Doctrine and Doctrine mentality.	Comment noted.
394	Public Hearing	After Hearing	Miguel Anguiano	Action Network Petition	41	Once our sacred places are gone they will never be replaced	Comment noted.
395	Public Hearing	After Hearing	Monika Hinse	Action Network Petition	42	Respect indigenous rights. Respect Governor Stephen R. Lewis request to Army Corps of Engineers to deny permit for project as it is a violation of public trust without proper full and competent review of tribe's protection rights. No loop please!	See response to Tupac Enrique, GRIC Comment #82.
396	Public Hearing	After Hearing	Linda McCoy	Action Network Petition	43	This needs to be stopped. When is our government going to listen to the people.	Comment noted.
397	Public Hearing	After Hearing	Lorie Fisher	Action Network Petition	44	Please deny this permit. ADOT needs to halt the work and destruction along the SMF 202 project. They did not follow the law for this route, and it will be proven in the Ninth Circuit Court soon.	Comment noted.
398	Public Hearing	After Hearing	Stephanie Mushrush	Action Network Petition	45	Protect Moahdak Doag, the sacred south mountain of the Akimel Ootham community and many other tribes. This land should be protected and wishes of the Gila River Pima tribal members, respected.	Please see response to Unknown, GRIC GOV Comment #3.

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399	Public Hearing	After Hearing	Sharon Cini-Pinto	Action Network Petition	46	Honor Indigenous rights and do not desecrate South Mountain! The Oldham people say no. Please listen and respect their wishes. Thank you.	Please see response to Unknown, GRIC GOV Comment #3.
400	Public Hearing	After Hearing	Julissa Rivera	Action Network Petition	47	Peoples, equal to all other peoples.	Comment noted.
401	Public Hearing	After Hearing	Amanda Barrera	Action Network Petition	48	This is a sacred mountain and there is a lot of history in this area for the people	Please see response to Unknown, GRIC GOV Comment #3.
402	Public Hearing	After Hearing	Toni Lynn	Action Network Petition	49	Please deny consent for this project We need to quit destroying more earth for the humans. How many wild horses, burros, mountain lions, wolves, etc. are going to be displaced if this project goes forward? Please deny.	Please see responses to Melissa Scianni, EPA Comment #1 and #2.
403	Public Hearing	After Hearing	Phill Harris	Action Network Petition	50	Leave the land to the Pueblos	The project is not located on tribal lands. Please see response to Unknown, GRIC GOV Comment #3.
404	Public Hearing	After Hearing	Pliny Draper	Action Network Petition	51	The citizens, on the south side of the mountain, were not informed of an alternate route that was in the competition. Rather, they were led to believe	This comment appears to be incomplete. However, ADOT and FHWA took significant efforts to involve the public and agencies in the development of the project. Several meetings for the public were held to provide information and receive feedback during the development of alternatives. Please see Chapter 6 of the FEIS for more details.

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405	Public Hearing	After Hearing	Michael Moynihan	Action Network Petition	52	<p>"In violation of the Right of Free, Prior and Informed Consent."</p> <p>Legitimacy can be achieved only if consent is granted. If there is no consent of the people, then there is no legitimacy. A government or a government agency acting without the consent of the people is illegitimate, rogue, and tyrannical, and is in direct violation and contradiction of the values and principles of democracy.</p> <p>The proposed Loop 202 South Mountain Freeway Project is currently illegitimate, that is, without consent, and therefore the government and government agencies acting without the consent of the people are acting in direct violation and contradiction of the values and principles of democracy.</p> <p>Thus, either consent must be sought for and granted for the Loop 202 South Mountain Freeway Project, or the proposal for the project must be denied. Consent is clearly being denied, therefore, the proposal for the Loop 202 South Mountain Freeway Project must also be denied.</p> <p>This is the essence of democracy, and democracy is at the core of our values as people in the United States. Therefore, I also deny</p>	Please see the response to Multiple Petition Signers, Action Network Petition Comment #1.

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						consent for the proposed Loop 202 South Mountain Freeway Project.	
406	Public Hearing	After Hearing	Robert Vanasco	Action Network Petition	53	There are better alternatives. Freeway was approved in 1985 yet Phoenix built on the land anyway; we have established our lives and secured the environment without freeway. It's not for us to adjust it's for you to figure out a different alternative that does not have a freeway directly behind our homes and schools.	Please see responses to Elizabeth Langbauer, Individual Comment #44 and Governor Lewis, GRIC GOV Comment #3.
407	Public Hearing	After Hearing	Morgayne Love	Action Network Petition	54	Because mother earth matters.	Comment noted.

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408	Public Hearing	After Hearing	Shannon Rivers	Action Network Petition	55	The construction of Loop 202 is a violation of Human Rights and a blatant disregard of the religious and spiritual rights of the members of the Gila River Indian Community and to all Native Americans_. Moreover, any destruction to Moahdak Do'ag (greasy mountain... aka. South Mountain), a place scared to the Akimel O'otham, will have long term adverse effects_ to the mental and spiritual growth of their children. I call on your sense of consciousness and humanity not to build this freeway.	
409	Public Hearing	After Hearing	Shea Pablo	Action Network Petition	56	Concerns of the negative impacts on the Community's environment.	As stated in the responses to Unknown, GRIC GOV Comments #3-10, several mitigation measures are being implemented to ensure that impacts to tribal lands are avoided or are minimized where indirect impacts have potential to occur.
410	Public Hearing	After Hearing	Marty Light	Action Network Petition	57	Poorly planned and not necessary- destroying the beautiful desert, mountains and environment.	As stated in the FEIS and again in Section III of the Corps' ROD, a need for a major transportation facility was identified to address unmet transportation demand in the area. The proposed action was identified as the alternative that best meets the purpose and need in consideration of the impacts to the environment.
411	Public Hearing	After Hearing	James Villalobos	Action Network Petition	58	Understand the meaning of sacred land please we as native people wouldn't go tear up & drive tractors where your ancestors lay resting so respect ours as we would respect yours	Please see the comment response to Leigh Kuwanwisiwma, Hopi Comment #1.
412	Public Hearing	After Hearing	SIRITA BENALLY	Action Network Petition	59	Tribal Consultation needs to be put first when determining this project.	Please see the response to Multiple Petition Signers, Action Network Petition Comment #1.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
413	Public Hearing	After Hearing	Paul Jones	Action Network Petition	60	<p>This expansion is completely unnecessary and will only further degrade what little is left of the natural landscape of Phoenix. Even 30 years ago people from all over the country used to come here for the air quality and now it is quickly becoming one of the worst in the nation. South Mountain is sacred to over 20 Native American tribes, and even as a white man who spends several days out of the year hiking and birdwatching and enjoying the scenery there, I fail to understand how a place where I can be warned with fines by park rangers for even going off a trail for taking a photo of an animal within the preserve, how it can be okay for ADOT to completely destroy several acres of habitat of the wildlife there? How come every time money and "progress" is in one side and nature is on the other, nature always loses? In a 100 years would you rather your great grandchildren had a bunch of roads to save a few minutes in traffic on, or a mountain? Isn't the whole point of "saving time" so we can have more to remember to "stop and smell the roses?" If we keep bulldozing every place those native wildflowers once bloomed here for new lofts and gated communities and Wal-Mart's and freeway expansions, where are we ever supposed to go to actually SEE the beauty of the</p>	<p>Please see response to Unknown, GRIC GOV Comment #2 and Elizabeth Goff, PMPC Comment #32.</p>

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						Sonoran desert that we all love? Haven't we colonized and paved and destroyed enough of South Phoenix already?	
414	Public Hearing	After Hearing	Talia Trepte	Action Network Petition	61	Those working on large scale projects such as this should be aware of indigenous rights, environmental impact, and transparency.	The Corps recognizes the sovereign status of Tribal governments and has established national policies regarding the consideration of rights of indigenous peoples. The policies recognize the central role of Tribes in protecting and managing their own resources and the need for consultation to ensure that the Federal government's trust responsibilities are met when making decisions which may affect them. Additionally, the Corps must comply with all regulations that require federal agencies to consider the impacts of their actions. Additional regulations and policies also require the Corps to publish notices to make the public aware that the agency is considering taking action on permit decisions and requesting comments.
415	Public Hearing	After Hearing	Ahma 2legged	Action Network Petition	62	RESPECT this sacred place! Would YOU want a roadway built on top of where YOUR ancestors have prayed for thousands of years when there are many alternatives to build this roadway on alternate routes?	See response to Unknown, GRIC GOV Comment 3 and Governor Lewis, GRIC GOV Comment 3
416	Public Hearing	After Hearing	Virginia Begay	Action Network Petition	63	Defend the sacred	Comment noted.
417	Public Hearing	After Hearing	Greg Cotton	Action Network Petition	64	Respect for First Nations people	Comment noted.

Sort	Event	Comment Type	Commenter	Organization	Code	Comment Summary	Corps response
418	Public Hearing	After Hearing	Edward Wemytewa	Action Network Petition	65	Please no more GENTRIFICATION because our Indigenous land base along with natural resources are being negatively impacted, meaning that the depletion of such resources will only displace us further from our homelands.	The project is not located on tribal lands. However, the project would impact the South Mountains (identified as a TCP) and may result in indirect impacts to tribal lands downstream of the project. As stated in the responses to Unknown, GRIC GOV Comment #3-10, several mitigation measures are being implemented to ensure that impacts to tribal lands are avoided or are minimized where indirect impacts have potential to occur.
419	Public Hearing	After Hearing	Adrian Garcia Solache	Action Network Petition	66	[Translated from Spanish] As part of the original peoples of the American continent, we stand in solidarity with the struggle of our brothers in the north, to preserve their sacred places. The original peoples of America live.	Comment noted.