Addendum No. 2 to the Environmental Impact Report on the American River Watershed Common Features Project/ Natomas Post-authorization Change Report/ Natomas Levee Improvement Program Phase 4b Landside Improvements Project

Prepared for:

Sacramento Area Flood Control Agency

September 2018

State Clearinghouse No. 2009112025`

Prepared by:

GEI Consultants

Consulting Engineers and Scientists

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Project No. 1602400

Table of Contents

Appendices

Abbreviations and Acronyms

ARCF GRR	American River Common Features General Reevaluation Report
Caltrans	California Department of Transportion
CEQA	California Environmental Quality Act
CRHR	California Register of Historic Resources
dbh	diameter at breast height
EIR	Environmental Impact Report
FWARG	Far Western Anthropological Research Group, Inc.
IDM	investigation-derived material
LAP	Levee Accreditation Project
MMRP	Mitigation Monitoring and Reporting Program
NHPA	National Historic Preservation Act
NEMDC	Natomas East Main Drainage Canal
NRHP	National Register of Historic Places
SAFCA	Sacramento Area Flood Control Agency
SRCSD	Sacramento Regional County Sanitation District
UAIC	United Auburn Indian Community
USACE	U.S. Army Corps of Engineers

1. Introduction

This Addendum No. 2 to the Final Environmental Impact Report for the American River Watershed Common Features Project/Natomas Post-authorization Change Report/Natomas Levee Improvement Program (NLIP), Phase 4b Landside Improvements Project (Phase 4b Project) (State Clearinghouse No. 2009112025) (SAFCA 2010), addresses proposed minor modifications and refinements to the improvements proposed in Reach I on the American River North Levee. These proposed minor modifications and refinements involve modifications at City Sump 58; use of slag cement-cement-bentonite (SCCB) backfill to construct cutoff walls; additional details of staging areas, and borrow and disposal sites; traffic control; and recreational access, as described in more detail in Section 4, below. Appendix A includes maps illustrating the location of project features.

2. Summary of Previous Environmental Review Process

The U.S. Army Corps of Engineers (USACE), Sacramento District, as lead agency under the National Environmental Policy Act (NEPA), and the Sacramento Area Flood Control Agency (SAFCA), as lead agency under the California Environmental Quality Act (CEQA),[1] prepared a joint Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR) for the American River Watershed Common Features Project/Natomas Post-authorization Change Report/NLIP, Phase 4b Project, and distributed the Draft EIS/EIR on July 2, 2010 for a 45-day public review period. Four public meetings were held in Sacramento and in the Natomas Basin during the public comment period.

The public comment period on the Draft EIS/EIR ended on August 16, 2010. A Final EIS/EIR document was published by SAFCA on October 22, 2010, and certified by the SAFCA Board of Directors on November 12, 2010. The Draft and Final EIS/EIR are available at SAFCA's offices at 1007 7th Street, 7th Floor, Sacramento, CA 95814, and online at SAFCA's Web site (http://www.safca.org/Programs_Natomas.html).

Table 1 contains a summary of previous environmental documentation prepared for the NLIP, and identifies specific analysis topics relevant to the project refinements and modifications analyzed in this Addendum No. 2 to the EIS/EIR for the Phase 4b Project.

[1] CEQA is found at California Public Resources Code [PRC], Sections 21000 et seq., and the State CEQA Guidelines are found at California Code of Regulations [CCR], Title 14, Section 15000 et seq.

Table 1. Natomas Levee Improvement Program Environmental Documentation

Document Title	Related Project Refinements and Modifications
Environmental Impact Report on Local Funding Mechanisms for Comprehensive Flood Control Improvements for the Sacramento Area. (2007 Landside EIR) SCH 2006072098 (February 2007)	Not related to project refinements and modifications analyzed in this Addendum.
Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project. (Phase 2) SCH 2007062016 (November 2007)	Not related to project refinements and modifications analyzed in this Addendum.
Supplement to the Environmental Impact Report on the Natomas Levee Improvement Program Landside Improvements Project—Phase 2 Project. SCH 2007062016. (January 2009)	Not related to project refinements and modifications analyzed in this Addendum.
Environmental Impact Report on the Natomas Levee Improvement Program Phase 3 Landside Improvements Project. SCH 2008072060 (May 2009)	Not related to project refinements and modifications analyzed in this Addendum.
Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project – Phase 2 Project. SCH 2007062016 (June 2009)	Not related to project refinements and modifications analyzed in this Addendum.
2nd Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Project – Phase 2 Project. SCH 2007062016 (August 2009)	Not related to project refinements and modifications analyzed in this Addendum.
Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Program Phase 3 Landside Improvements Project. SCH 2008072060 (September 2009)	Not related to project refinements and modifications analyzed in this Addendum.
Environmental Impact Report on the Natomas Levee Improvement Program Phase 4a Landside Improvements Project. SCH 2009032097 (November 2009)	Hewitt site used for borrow, and identified as location where discharge pipes would be extended through new levee. *Project modifications and refinements include use of excess soils from Reach I construction to restore ground surface, which was previously excavated, to its former grade.* Analyzed material hauling on various project roadways. *Project modifications and refinements include overall reductions in the number of truck trips, and adjustments to hauling, including transporting excess soil from Reach I to Reach 19A and the Hewitt site.*
Environmental Impact Statement/Final Environmental Impact Report on the American River Watershed Common Features Project/Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project. SCH 2009112025 (October 2010)	Analyzed construction of cutoff walls in Reach I using cement-bentonite (CB), soil-cement-bentonite (SCB) or soil-bentonite (SB) backfill as seepage remediation in Reach I. *Project modifications and refinements include use of SCCB in cutoff walls and use of a drainage blanket as a seepage remediation.* Analyzed levee and roadway raise and replacement of discharge pipes at City Sump 58. *Project modifications and refinements include replacement of discharge pipes without requiring Garden Highway to be raised.* Analyzed material hauling on various project roadways. *Project modifications and refinements include overall reductions in the number of truck trips, and adjustments to*

Table 1. Natomas Levee Improvement Program Environmental Documentation

Document Title	Related Project Refinements and Modifications
	hauling, including transporting excess soil from Reach I to Reach 19A and the Hewitt site. Analyzed use of borrow material for improvements in Reach I. *Project modifications and refinements no longer require local soil borrow.* Analyzed staging areas, including Discovery Park. *Project modifications and refinements include additional detail concerning staging areas, and potential use of Reach 19A or Hewitt site for staging.* Analyzed temporary closure of Garden Highway during construction. *Modifications and refinements include additional lane closures on Garden Highway.*
Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Phase 4a Landside Improvements Project. SCH 2009032097 (February 2011)	Not related to project refinements and modifications analyzed in this Addendum.
2nd Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Program Phase 3 Landside Improvements Project. SCH 2008072060 (August 2011)	Not related to project refinements and modifications analyzed in this Addendum.
2nd Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Phase 4a Landside Improvements Project. SCH 2009032097 (April 2012)	Not related to project refinements and modifications analyzed in this Addendum.
3rd Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Phase 4a Landside Improvements Project. SCH 2009032097 (July 2012)	Not related to project refinements and modifications analyzed in this Addendum.
Supplemental Environmental Impact Report No. 2 for the Natomas Levee Improvement Program Landside Improvements Project (Phase 2) SCH 2007062016 (October 2012)	Not related to project refinements and modifications analyzed in this Addendum.
3rd Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Program Phase 3 Landside Improvements Project. SCH 2008072060 (July 2014)	Not related to project refinements and modifications analyzed in this Addendum.
4th Addendum to the Environmental Impact Report on the Natomas Levee Improvement Program, Landside Improvements Program Phase 3 Landside Improvements Project. SCH 2008072060 (May 2017)	Not related to project refinements and modifications analyzed in this Addendum.
Addendum to the Environmental Impact Report on the American River Watershed Common Features Project/Natomas Post-authorization Change Report/Natomas Levee Improvement Program, Phase 4b Landside Improvements Project. SCH 2009112025 (April 2018)	Not related to project refinements and modifications analyzed in this Addendum.

3. Summary of the Phase 4b Project

The Phase 4b Project addresses underseepage, stability, erosion, penetrations, and levee encroachments along approximately 3.4 miles of the Sacramento River east levee (Reach A:16–20), approximately 1.8 miles of the American River north levee (Reach I:1–4), approximately 6.8 miles of the Natomas East Main Drainage Canal (NEMDC) west levee (Reach F–G), approximately 3.3 miles of the Pleasant Grove Creek Canal (PGCC) west levee (Reach E), and the gaps left in the improvements of previous phases at levee penetrations and road crossings on the Natomas Cross Canal (NCC) south levee. Plate 1 in Appendix A illustrates the reaches and phases of the NLIP project.

The Phase 4b project includes the following actions to address underseepage, stability, erosion, penetrations, and encroachments:

- Constructing an adjacent levee along the Sacramento River east levee Reach A:16–20; and installing cutoff walls, seepage berms, and relief wells where required for this levee.
- Installing a cutoff wall in the American River north levee east of Gateway Oaks Drive to Northgate Boulevard, and landside slope flattening.
- Raising the NEMDC west levee in place or widening the levee from just south of Elkhorn Boulevard to Sankey Road, as well as landside slope flattening and seepage remediation as necessary.
- Constructing waterside erosion protection in locations along the PGCC and NEMDC (south of Elkhorn Boulevard).
- Upgrading or removing culverts located beneath the PGCC, and providing replacement flood storage as needed.
- Installing seepage remediation at the State Route (SR) 99 crossing of the NCC and constructing a moveable barrier system to prevent overflow from reaching the landside of the NCC south levee.
- Realigning the western portion of the West Drainage Canal to the south, and improving the remaining portion of the existing canal to reduce bank erosion and sloughing, decrease aquatic weed infiltration, improve Reclamation District (RD) 1000 maintenance access, and enhance giant garter snake habitat connectivity.
- Relocating irrigation canals and ditches, either to make room for expanded levee sections or to reduce underseepage potential.
- Raising discharge pipes for RD 1000 pumping plants and City of Sacramento sump pumps to cross the levee above design flood water surface elevation.
- Excavating and reclaiming parcels in the South Fisherman's Lake and Triangle Properties Borrow Areas and at the West Lakeside School Site as agricultural land.

- Establishing woodland groves to compensate for impacts along the Sacramento River east levee Reach A:16–20, American River north levee Reach I:1-4, and NEMDC.
- Acquiring right-of-way to construct, operate, and maintain the improvements.

4. Modifications and Refinements to the Project

4.1 Minor Project Refinements with No Environmental Impacts Not Evaluated in Detail

The minor project refinements listed below would result in no new environmental impacts and would not increase the intensity or severity of impacts previously evaluated in the prior EIR, and therefore are not evaluated further in this Addendum.

- Change cutoff wall material to use slag cement-cement-bentonite (SCCB) to construct cutoff walls rather than cement-bentonite (CB), soil-cement-bentonite (SCB) or soil-bentonite (SB) backfill, as analyzed in the EIS/EIR for the Phase 4b Project. This change from the project as analyzed in the EIS/EIR for the Phase 4b Project would reduce the extent of the levee degrade required for construction because SCCB requires less material on either side of the cutoff wall trench to avoid potential cracking in the levee during construction; therefore, the previously construction impacts would be reduced.
- Instead of a levee and roadway raise of Garden Highway to replace City Sump 58 discharge pipes, the project has been modified to raise the pipes by 3 feet to span over the newly constructed cutoff wall instead. The relocated (raised) pipes, which would require less construction work than the levee and roadway raise would cross Garden Highway approximately 1 foot below the surface of the existing road, and would be placed within cement-based backfill material with a strength sufficient to allow traffic on Garden Highway to cross over the pipes without damaging them. The construction-related impacts associated with relocating these pipes was analyzed in the EIS/EIR for the Phase 4b Project, and this change would reduce those impacts by avoiding a raise to the roadway.
- Archaeological monitoring and Native American consultation would be conducted in accordance with the 2015 Programmatic Agreement for the American River Common Features project.

4.2 Minor Project Refinements Evaluated in Detail

4.2.1 Soil Balance

Local soil borrow is no longer required for this Reach of the project. The EIS/EIR for the Phase 4b Project stated that up to 167,000 cubic yards of borrow would come from the Fisherman's Lake Borrow Area and West Lakeside School Site. A commercial source of 15,900 tons within 30 miles was also

identified, along with haul routes along public roadways and adjacent to borrow sites and associated truck trips. The proposed modifications and refinements include a reduction in the amount of borrow that would be needed based on the change in cutoff wall type and construction refinements, all of which were analyzed in previous environmental documentation (see Table 1 for details). Approximately 1,740 tons of aggregate base and approximately 6,700 tons of asphalt concrete for the reconstruction of Garden Highway would be hauled from commercial sources within 30 miles of the project site. Approximately 7,800 tons of controlled low strength material (a sand-cement mixture) would be hauled to the project site to be used for capping the cutoff wall, and pipe bedding at City Sump 58.

Based on the reduction in the amount of borrow needed and considering potential haul of commercial fill material, there would be a net reduction in truck trips overall for USACE commercial import hauling, but the timing of hauling would change compared to what was analyzed in the EIS/EIR for the Phase 4b Project.

Excess soil material would need to be removed from the levee improvement sites along the American River north levee in Reach I. USACE has identified two sites to receive this excess material. At Reach 19A (located within Reach A, across Garden Highway from Sand Cove Park), these excess materials could be used to construct the planned seepage berm (also analyzed in the EIS/EIR for the Phase 4b project). This would reduce the amount of borrow material required for subsequent Reach A construction in 2023, and would result in earlier construction of the seepage berm in 2019.

USACE would also place excess soil material at the "Hewitt" site, located in Reach B, approximately 1.6 miles south of the Interstate 5 (I-5) Sacramento River crossing near the Sacramento International Airport. The Hewitt site was identified in the 2009 Phase 4a FEIR as the site of a "private river pump" where pump discharge pipes would be extended through the new levee footprint in this reach. Levee construction in the vicinity of the Hewitt site and the haul route is covered in the Phase 4a EIR, and the haul route from Reach I to the Hewitt site is covered in the EIS/EIR for the Phase 4b Project. During implementation of the activities covered by the Phase 4a FEIR, a portion of the Hewitt site was used for borrow, and the land surface is now 5 feet below the previous grade. As part of the proposed modifications and refinements to the project, excess soil materials excavated from the cutoff wall trench would be placed in this area to "re-fill" the borrow area back to grade. Neither SAFCA nor USACE are proposing to change the ultimate reuse of the Hewitt site (which was identified in the prior environmental documents as being returned to crop land), and the haul routes were previously identified in prior environmental documents (see Table 1 for details).

4.2.2 Drainage Blanket

USACE proposes to install a drainage blanket on the landside slope of the American River north levee under the I-5 Bridges in place of a cutoff wall across the bridges. The existing concrete apron located on the landside slope would be removed, a drainage blanket would be placed within the existing levee slope, and the concrete apron would be replaced. The drainage blanket would provide a 200-foot overlap with the new cutoff wall being constructed on each side of I-5, further reducing flood risk in this area. The blanket drain and cutoff wall overlap would enable the construction of seepage remediation features without impacting traffic on I-5, and all construction activities would fall within the footprint analyzed in the EIS/EIR for the Phase 4b Project.

4.2.3 Schedule Changes

The construction schedule in the EIS/EIR for the Phase 4b Project identified cutoff wall and landside improvements to be constructed during a 1-year period in late 2012 and 2013. The proposed modifications to this schedule include construction in 2018 and/or 2019. The drainage blanket under the I-5 Bridges would be constructed over approximately 2 months, either between September and November of 2018, or concurrently with cutoff wall construction in 2019. Cutoff wall construction would occur between April and November 2019. Landside slope improvements (which are not part of the currently-proposed project modifications and refinements) are expected to be constructed in 2022.

Although the schedule for construction in Reach H is not certain, it is possible that the scheduled construction in Reaches H and I could overlap. If concurrent construction occurs, USACE would implement actions consistent with Mitigation Measure 4.10-a, "Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips" from the EIS/EIR for Phase 4b to minimize the cumulative impacts related to construction. At a minimum, the two projects would coordinate bridge and road closures so that bridge closures along Reach H would not occur during the full closure of Garden Highway for Reach I construction. Coordination of the construction would ensure that the cumulative impacts would not be cumulatively considerable, as further described in Section 4.2.4, "Traffic Control and Recreational Trail Changes," and 6.2, "Transportation and Circulation."

4.2.4 Traffic Control and Recreational Trail Changes

Due to changes in the construction schedule and sequencing, traffic controls and road/lane closures would be modified from those presented in the EIS/EIR for the Phase 4b Project.

For the construction of the drainage blanket under the I-5 Bridges, there would be three stages of work. In stage 1, a temporary recreational trail would be constructed on the waterside levee crown under the I-5 Bridges. This would not require closure of any traffic lanes or the existing recreational trail, but would require minimal excavation under the I-5 Bridges to maintain a minimum 10-foot height clearance for the trail. (This temporary recreational trail is a change/refinement from what was included in the EIS/EIR for the Phase 4b Project, but would be constructed within the envelope of impacts analyzed in that document.) In stage 2, the existing recreational trail at the landside levee crown would be temporarily closed while the drainage blanket is constructed under the I-5 Bridges. This would also require a temporary closure of the southern eastbound lane of Garden Highway. In stage 3, the recreational trail at the landside levee crown would be reconstructed. The road and trail configuration would return to pre-project conditions after construction.

For the construction of the cutoff wall, there would be four stages of work. In stage 1, Garden Highway would be temporarily closed just east of Gateway Oaks Drive for 1 month. In stage 2, one eastbound lane of Garden Highway would be converted to a temporary bicycle lane leading from Natomas Park Drive to Gateway Oaks Drive. Recreational traffic would use this lane for the duration of cutoff wall construction between Gateway Oaks Drive and Natomas Park Drive. The third and fourth stages could occur sequentially, and would have a total duration of 5 months. Garden Highway would be closed from the Natomas Park Drive to Truxel Road in stage 3, and in stage 4 Garden Highway would be closed from Truxel Road to Northgate Boulevard. The closure of the segment between Truxel Road and Northgate Boulevard would be restricted to the shortest feasible period. If construction on Reaches H and I overlaps, no bridge closures in Reach H would occur during the full closure of Garden Highway between Truxel Road and Northgate Boulevard. Detours would be as described in the EIS/EIR for the Phase 4b Project.

The traffic controls for cutoff wall construction would include minor modifications from those described in the EIS/EIR for the Phase 4b Project. Although the full closure of Garden Highway would last for 6 months or less and occur as described in the EIS/EIR for the Phase 4b Project, some lane closures would occur before and after the full closure of Garden Highway. Two left turn lanes from the off-ramps from I-5 onto Garden Highway, as well as the southern eastbound lane of Garden Highway would be closed for approximately 4 weeks.

5. Standard for Preparation of an Addendum

If, after adoption of an EIR, altered conditions or changes or additions to a project are proposed, the State CEQA Guidelines provide three ways to address these changes: a Subsequent EIR (Section 15162), a Supplemental EIR (Section 15163), or an Addendum (Section 15164).

State CEQA Guidelines Section 15162[2] describe the conditions when preparing a Subsequent EIR is required.[3] A Subsequent EIR is appropriate if the lead agency determines, on the basis of substantial evidence in light of the whole record, that one or more of the following conditions is met:

- Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

- Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

- New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified, shows any of the following:

    - The project will have one or more significant effects not discussed in the previous EIR;

    - Significant effects previously examined will be substantially more severe than shown in the previous EIR;

[2] See State CEQA Guidelines, Section 15162(a)(1)-(3).

[3] A Supplemental EIR is required if any of the conditions described in Section 15162 would require preparation of a Subsequent EIR, but only minor additions or changes would be necessary to make the previous EIR adequate. State CEQA Guidelines, Section 15163(a)(1)-(2).

- Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

- Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

State CEQA Guidelines Section 15164 states that a lead agency may prepare an Addendum to a certified EIR if some changes or additions are necessary, but none of the conditions described above in Sections 15162 or 15163 calling for the preparation of a Subsequent or Supplemental EIR have occurred.

As explained in the analysis in Section 6, "Environmental Analysis," the proposed minor modifications and refinements to the project would not:

- result in any new significant or potentially significant environmental effects, or

- result in a substantial increase in the intensity or severity of previously identified significant or potentially significant effects.

In addition, no new information of substantial importance has arisen that shows that:

- the project would have new significant or potentially significant effects,

- the project would have substantially more intense or severe effects,

- mitigation measures previously found to be infeasible would in fact be feasible, or

- mitigation measures that are considerably different from those analyzed in the EIR would substantially reduce one or more significant or potentially significant effects on the physical environment.

Because none of the conditions described in Section 15162 of the State CEQA Guidelines calling for preparation of a Subsequent EIR have occurred, an Addendum to the EIR, consistent with Section 15164 of the State CEQA Guidelines, is the appropriate CEQA document to evaluate the proposed modifications and refinements to the project and substantiate that none of the conditions described in Section 15162 have occurred.

6. Environmental Analysis

This section of the Addendum analyzes the potential effects on the physical environment from implementation of the proposed minor modifications and refinements to the project. This analysis has been prepared to determine whether any of the conditions in State CEQA Guidelines Section 15162 (described in Section 1.4) would occur as a result of the proposed modifications and refinements.

The proposed project modifications and refinements in Section 4 would not cause any new significant or potentially significant impacts or a substantial increase in the intensity or severity of the impacts analyzed and disclosed in the prior EIR for the following topic areas, because the activities associated with the proposed modifications and refinements would result in negligible additional impacts that would not substantially increase the magnitude from the prior EIR:

- Agricultural Resources
- Land Use, Socioeconomics, and Population and Housing
- Geology, Soils, and Mineral Resources
- Hydrology and Hydraulics
- Water Quality
- Cultural Resources
- Paleontological Resources
- Noise
- Visual Resources
- Utilities and Service Systems
- Hazards and Hazardous Materials
- Environmental Justice

The following topic areas may be affected by the proposed modifications and refinements to the project and, therefore, are analyzed below.

6.1 Biological Resources

USACE identified two additional special-status species that may be present at the project site: Western yellow-billed cuckoo and least Bell's vireo.

USACE reinitiated formal consultation on the Natomas Basin Project with the U.S. Fish and Wildlife Service (USFWS) on June 20, 2016. On August 11, 2016, USFWS responded with an amended Biological Opinion. Given the proposed avoidance measures and the few occurrences of both species in the Sacramento Valley, USFWS believes that adverse effects to least Bell's vireo are unlikely to occur and are therefore discountable for the purposes of consultation. USFWS found that the project may affect, but is not likely to adversely affect, the Western yellow-billed cuckoo because the affected potential habitat would be replaced in mitigation sites within the Natomas Basin, and there is other available habitat for the Western yellow-billed cuckoo to use during its migration. Correspondence related to special-status species is included in Appendix B.

Based on USFWS's findings in the Biological Opinion, potential impacts on the Western yellow-billed cuckoo and the least Bell's vireo would be less than significant.

Implementing Mitigation Measures 4.7-a (Minimize Effects on Woodland Habitat; Implement Woodland Habitat Improvements and Management Agreements; Compensate for Loss of Habitat; and Comply with Section 7 of the Federal Endangered Species Act, Section 2081 of the California Endangered Species Act, and Section 1602 of the California Fish and Game Code) and 4.7-f (Minimize Potential Impacts on Swainson's Hawk and Other Special-Status Birds Foraging and Nesting Habitat, Monitor Active Nests during Construction, Implement All Upland and Agricultural Habitat Improvements and Management Agreements to Compensate for Loss of Quantity and Quality of Foraging Habitat, Obtain Incidental Take Authorization), which were previously adopted and

incorporated into the EIS/EIR for the Phase 4b Project, would further reduce these less-than-significant impacts. No further mitigation is required.

6.2 Transportation and Circulation

The traffic controls for cutoff wall construction would include minor modifications from those described in the EIS/EIR for the Phase 4b Project. Although the full closure of Garden Highway would last for 6 months or less and occur as described in the EIS/EIR for the Phase 4b Project, some lane closures would occur before and after the full closure of Garden Highway. Two left turn lanes from the off-ramps from I-5 onto Garden Highway, as well as the southern eastbound lane of Garden Highway would be closed for approximately 4 weeks. Although these lane closures would prolong impacts to traffic, these would not substantially worsen the significant traffic impact identified in the EIS/EIR for the Phase 4b Project.

The project modifications and refinements would reduce the amount of soil borrow needed, but would include transport of excess soil from Reach I to Reach 19A and/or the Hewitt site, and would include use of commercial aggregate materials. The net effect of these changes would be a reduction in the total number of truck trips compared to what was analyzed in the EIS/EIR for the Phase 4b Project. Due to the schedule changes, this hauling would occur over a different time period compared to what was analyzed in the EIS/EIR for the Phase 4b Project.

The trips and road closures would occur during September to November 2018, and April to November 2019. In the event that construction of Reach H would also occur in 2019, as part of its traffic safety and control plan USACE has committed that bridge closures on the NEMDC would not overlap with the closure of Garden Highway between Truxel Road and Northgate Boulevard. (USACE 2018)

Implementing Mitigation Measure 4.10-a (Prepare and Implement a Traffic Safety and Control Plan for Construction-Related Truck Trips) which was previously adopted and incorporated into the EIS/EIR for the Phase 4b Project, would reduce the impacts, but, as described in the EIS/EIR for the Phase 4b Project, the impact would remain significant and unavoidable.

6.3 Air Quality

USACE conducted an air quality analysis using the Sacramento Metropolitan Air Quality Management District's (SMAQMD's) Road Construction Emissions Model, versions 8.1.0 and 9.0.0 for the cutoff wall portion of the proposed modifications and refinements. This model estimates emission rates for reactive organic gases (ROG), nitrogen oxides (NO_x), particulate matter up to 10 microns in diameter (PM_{10}), particulate matter up to 2.5 microns in diameter ($PM_{2.5}$), carbon dioxide (CO_2), and carbon dioxide equivalent (CO_2e). Modeling results are provided in Appendix C to this document.

Table 1. Estimated Air Emissions for Natomas Reach I Cutoff Wall Project (Unmitigated)

	ROG	CO	NOX	PM10	PM2.5	CO2	CO2e
Estimated Maximum Emissions (lbs/day)	9	56	**95**	25	9	10,307	**10,411**
SMAQMD Thresholds (lbs/day)	N/A	N/A	85	80	82	N/A	1,100*
Total (tons/project)	0.6	4.8	6.2	2.3	0.7	881.5	895.1
Federal Standards (tons/year)	25	100	25	100	100	N/A	N/A

Source: USACE 2018

Table 2. Estimated Air Emissions for Natomas Reach I Cutoff Wall Project (Mitigated)

	ROG	CO	NOX	PM10	PM2.5	CO2	CO2e
Estimated Maximum Emissions (lbs/day)	9	56	77	23	7	10,307	**10,411**
SMAQMD Thresholds (lbs/day)	N/A	N/A	85	80	82	N/A	1,100
Total (tons/project)	0.7	4.8	5	2.1	0.6	881.5	895.1
Federal Standards (tons/year)	25	100	25	100	N/A	N/A	N/A

Source: USACE 2018

USACE's modeled emissions for construction of the Reach I cutoff wall are only slightly higher (approximately 2- to 4-pound-per-day increase) than those presented in the EIS/EIR for the Phase 4b Project. Implementing Mitigation Measure 4.11-a (Implement Applicable District-Recommended Control Measures to Minimize Temporary and Short-Term Emissions of ROG, NO_X, and PM_{10} During Construction), which was previously adopted and incorporated into the EIS/EIR for the Phase 4b Project, would reduce these impacts to a less-than-significant level. No further mitigation is required

Due to scheduling changes, the Reach I construction will now likely occur simultaneously with construction of improvements in Reach H. The EIS/EIR for the Phase 4b Project identified a cumulatively considerable significant impact regarding air quality, but the cumulative air emissions from simultaneous construction at Reaches H and I would not substantially increase this impact because the EIS/EIR for the Phase 4b Project analyzed cumulative impacts of construction during the Phase 3, 4a, and 4b projects, including simultaneous construction of levee improvements in multiple reaches. No revisions to the EIS/EIR for the Phase 4b Project are required.

6.4 Recreation

The proposed modifications and refinements include changes to recreational trail detours during construction. A temporary trail along the waterside top of the levee beneath I-5 would serve as the detour during construction of the drainage blanket. A temporary bike lane extending from Natomas Park Drive to Gateway Oaks Drive would also be made available during cutoff wall construction between Natomas Park Drive and Gateway Oaks Drive. The availability of these temporary trails and lanes during construction would reduce the temporary construction impact on recreational trail users identified in the EIS/EIR for the Phase 4b Project.

7. Conclusions

As described in the preceding sections, the proposed minor modifications and refinements to the project do not require any revisions to the prior EIR because no new or substantially more intense or severe significant environmental impacts or potentially significant environmental impacts would result from the proposed modifications and refinements to the project. Section 15162 thresholds would not be triggered.

Based on the analysis in Section 3, "Environmental Analysis," the proposed modifications and refinements to the project as described in this Addendum would not result in any of the conditions

described in Section 15162 of the State CEQA Guidelines calling for preparation of a Subsequent EIR or Supplemental EIR. In summary, the proposed modifications and refinements to the project would not

- result in any new significant or potentially significant environmental effects,
- substantially increase the intensity or severity of previously identified effects,
- result in mitigation measures or alternatives previously found to be infeasible becoming feasible, or
- result in availability/implementation of mitigation measures or alternatives that are considerably different from those analyzed in the prior EIR that would substantially reduce one or more significant or potentially significant effects on the physical environment.

These conclusions confirm that a Subsequent or Supplemental EIR is not warranted, and this Addendum No. 2 to the prior EIR pursuant to State CEQA Guidelines Section 15164 is the appropriate CEQA document to evaluate and document the modifications and refinements (i.e., modifications to the timing of construction, and modifications to the size and location of woodland mitigation sites) to the project, and resulting impacts thereof. No changes are needed to the certified EIR or the adopted MMRP for the project.

8. References

United States Army Corps of Engineers, Sacramento District. 2018 (May 23) *Memorandum for Record: American River Common Features Natomas Basin Project, Reach I Construction Schedule Updates.* Sacramento, CA.

Appendix A. Plates

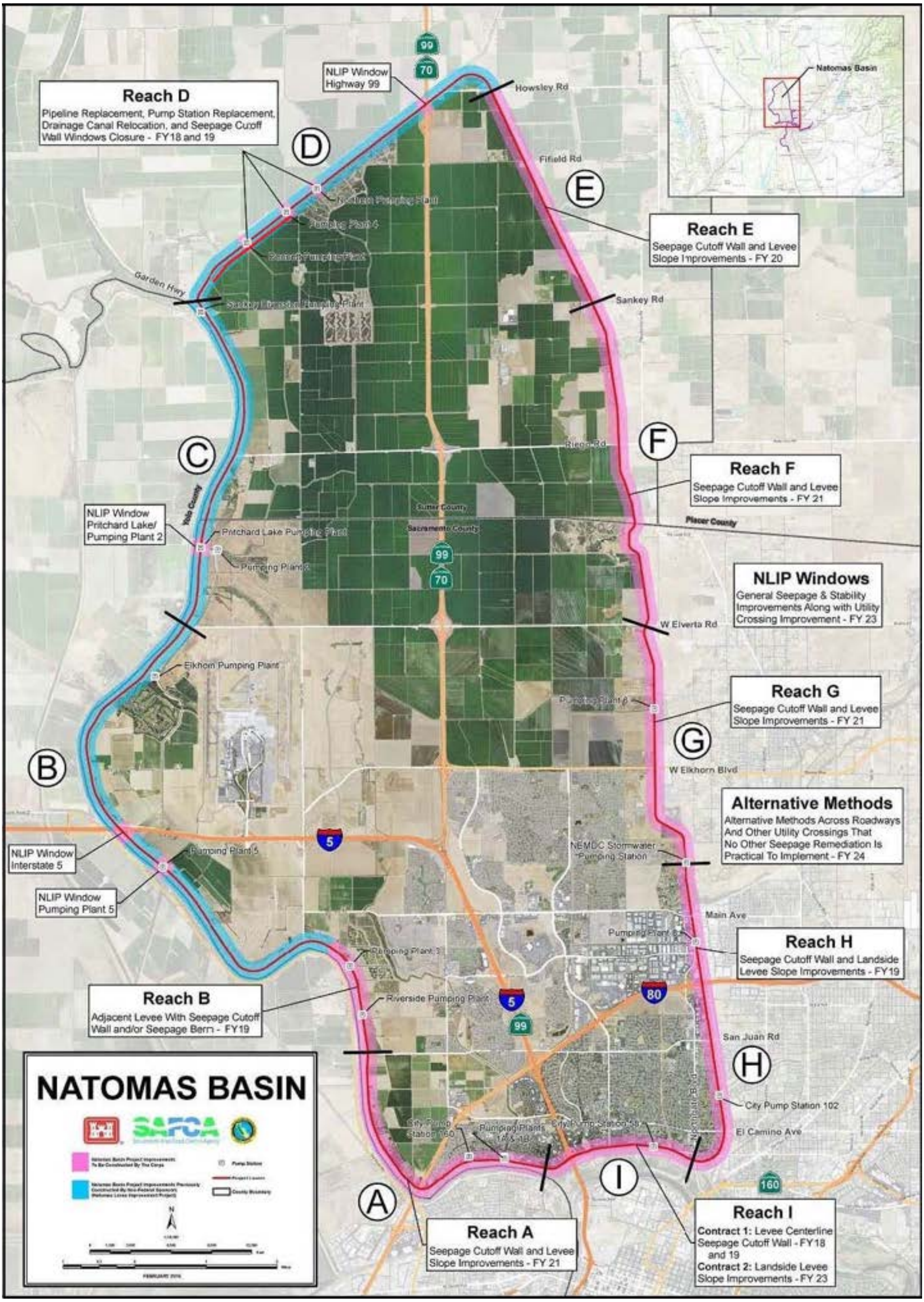
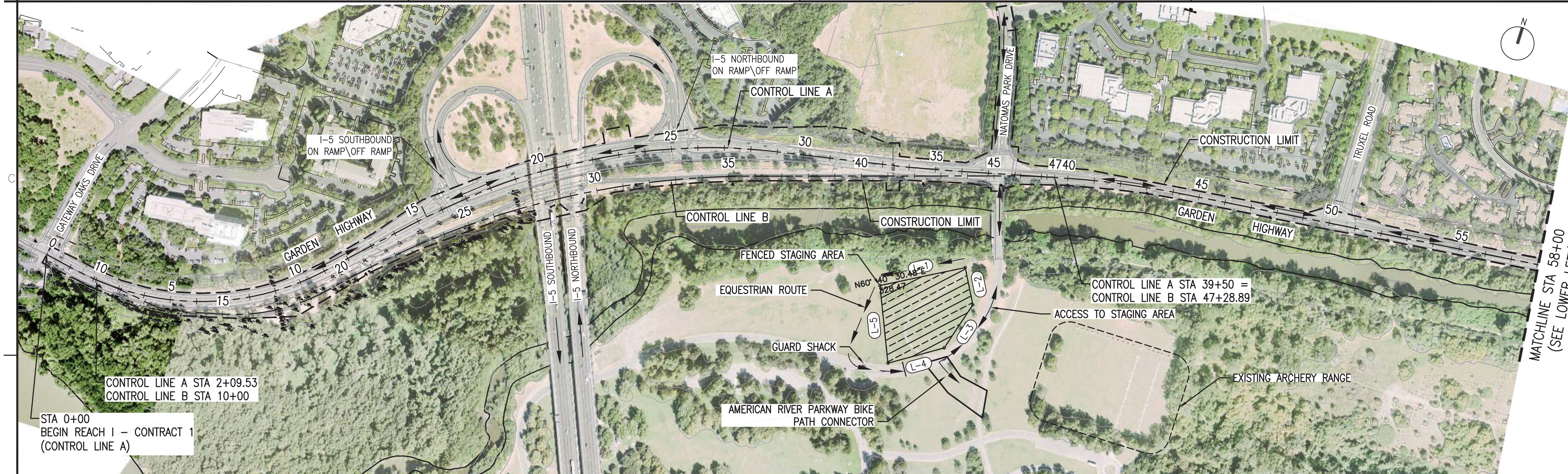
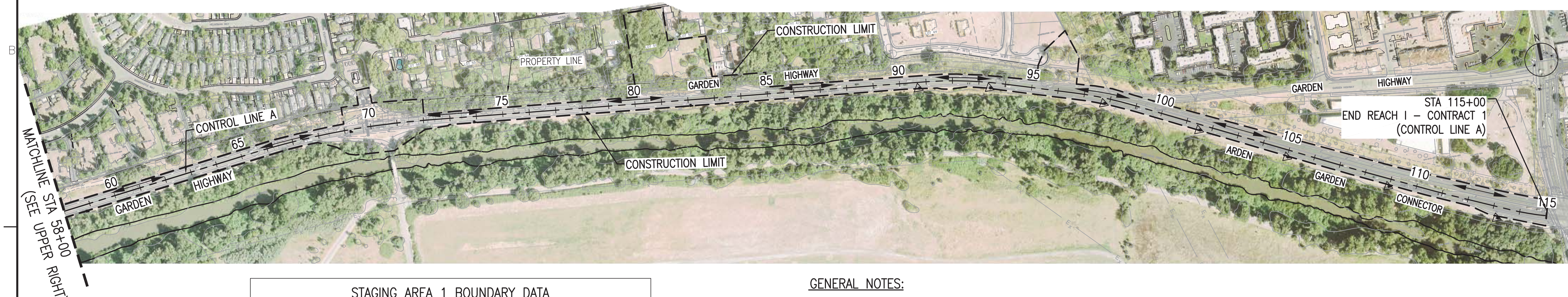

Reach D
Pipeline Replacement, Pump Station Replacement, Drainage Canal Relocation, and Seepage Cutoff Wall Windows Closure - FY18 and 19
NLIP Window Highway 99
Howsley Rd
Fifield Rd
Natomas Basin
Reach E
Seepage Cutoff Wall and Levee Slope Improvements - FY 20
Sankey Rd
Garden Hwy
Riego Rd
Reach F
Seepage Cutoff Wall and Levee Slope Improvements - FY 21
Yolo County
Sutter County
Placer County
Sacramento County
NLIP Window Pritchard Lake/ Pumping Plant 2
Pritchard Lake Pumping Plant
Pumping Plant 6
NLIP Windows
General Seepage & Stability Improvements Along with Utility Crossing Improvement - FY 23
W Elverta Rd
Elkhorn Pumping Plant
Reach G
Seepage Cutoff Wall and Levee Slope Improvements - FY 21
W Elkhorn Blvd
Alternative Methods
Alternative Methods Across Roadways And Other Utility Crossings That No Other Seepage Remediation Is Practical To Implement - FY 24
NLIP Window Interstate 5
NLIP Window Pumping Plant 5
Pumping Plant 5
NEMDC Stormwater Pumping Station
Main Ave
Pumping Plant 3
Reach H
Seepage Cutoff Wall and Landside Levee Slope Improvements - FY19
Reach B
Adjacent Levee With Seepage Cutoff Wall and/or Seepage Berm - FY19
Riverside Pumping Plant
San Juan Rd
City Pump Station 102
El Camino Ave
Reach A
Seepage Cutoff Wall and Levee Slope Improvements - FY 21
Reach I
Contract 1: Levee Centerline Seepage Cutoff Wall - FY18 and 19
Contract 2: Landside Levee Slope Improvements - FY 23
NATOMAS BASIN
SAFCA
Pump Station
County Boundary
A
B
C
D
E
F
G
H
I

Plate 2





STAGING AREA 1 BOUNDARY DATA

LINE CURVE	LINE/CHORD BEARING	DISTANCE	CHORD DISTANCE	RADIUS	POINT	NORTHING	EASTING
L-1	N60°40'30"E	328.47'	NA	NA	0+00.00	1982933.99	6703874.11
L-2	S28°57'19"E	143.41'	NA	NA	3+28.47	1983094.86	6703943.53
L-3	S16°10'34"W	194.86'	NA	NA	4+71.88	1982969.37	6703889.25
L-4	S57°21'46"W	219.91'	NA	NA	6+66.73	1982782.23	6703704.07
L-5	N23°16'56"W	294.32'	NA	NA	8+86.64	1982663.63	6703587.73

GENERAL NOTES:

1. THE CONTRACTOR SHALL LIMIT ACTIVITIES TO WITHIN THE CONSTRUCTION LIMIT AND STAGING AREA FOR THE WORK REQUIRED PER THIS CONTRACT.

2. SEE SHEET G-103 AND G-104 FOR CONSTRUCTION LIMIT INFORMATION.

3. STAGING AREA SHALL BE LIMITED TO TRAILERS AND STORAGE OF EQUIPMENT AND CONSTRUCTION MATERIAL ONLY. THE BATCH PLANT SHALL BE LOCATED ON TOP OF THE EXISTING LEVEE AS NOTED ON C-101 THROUGH C-113. PROVIDE PROTECTIVE FENCING AND PROTECT ALL TREES IN STAGING AREA.

200' 100' 0 200'
SCALE: 1"=200'

100%
NOT FOR CONSTRUCTION

US Army Corps of Engineers
Sacramento District

Symbol	Description	Date	Approved

Prepared by: Blake A. Brown, P.E.
Date: 07/2016
Rev.
Dwn by: RD
Spec No.: 1793
Design file no: 1-04-0570
Reviewed by: Peter Hradelik, P.E.
Drawing Code: -
Submitted by: Wesley Jacobs, P.E.
File name: G-106.DWG
Plot date:
Dwg scale: AS_NOTED

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

HDR | WLA
2365 IRON POINT ROAD, SUITE 300
FOLSOM, CA 95360

SACRAMENTO COUNTY CALIFORNIA
AMERICAN RIVER COMMON FEATURES PROJECT
NATOMAS BASIN
REACH I – CONTRACT 1 STA 0+00 TO STA 115+00

HAUL ROUTES AND STAGING AREAS

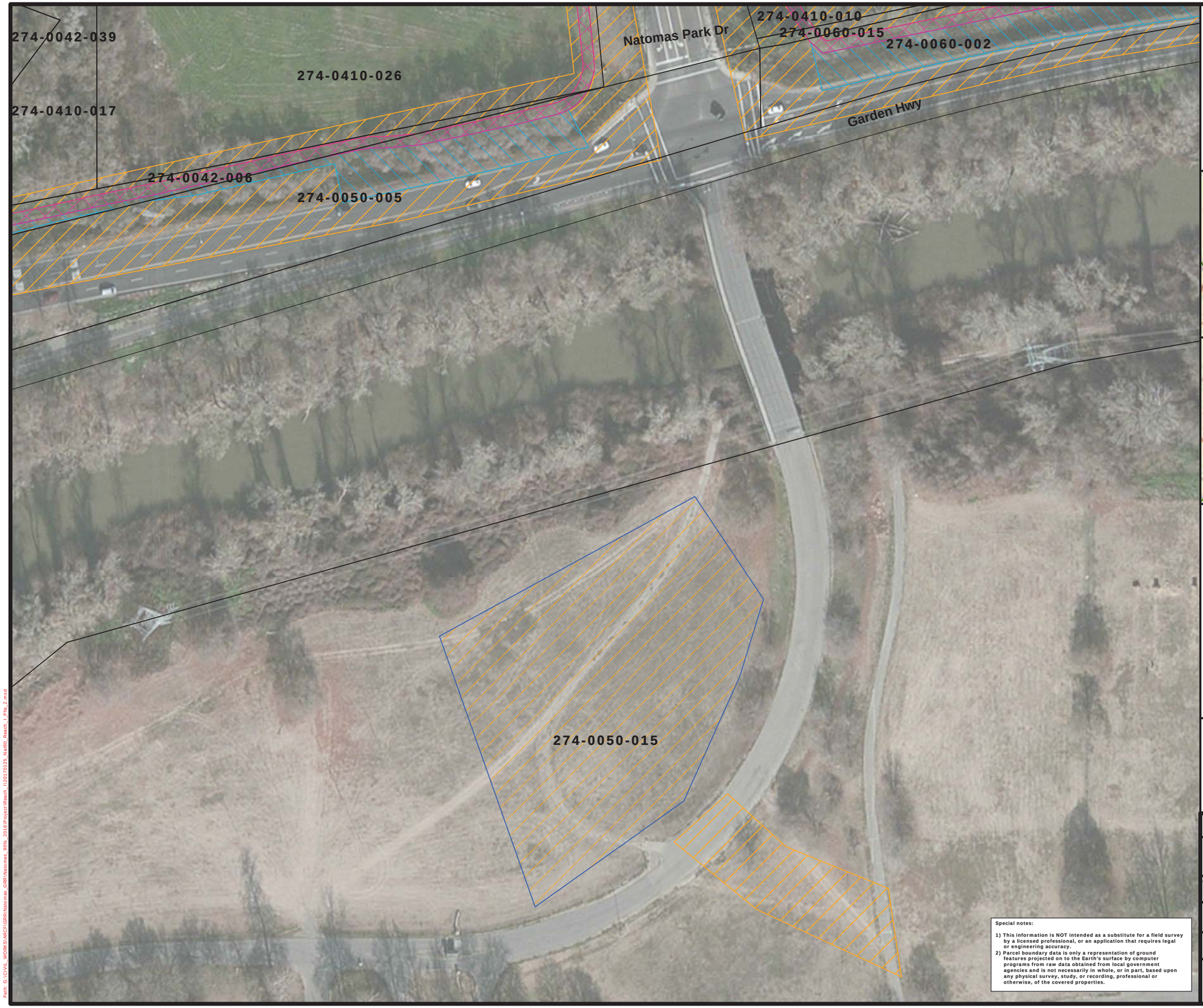
Sheet reference number:
G-106
Sheet 12 of 133

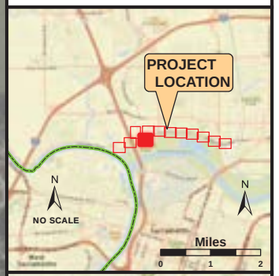
UPDATE

CORPS OF ENGINEERS

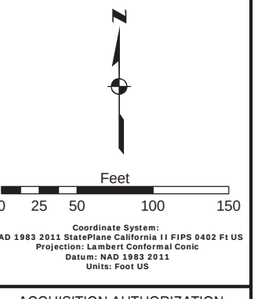
U.S. ARMY

Plate 3





MARGINALIA



Coordinate System:
NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

ACQUISITION AUTHORIZATION

Estates created using Eng. Division Civil Design drawing: 1-04-0570C-CG01XX.dwg, 06/05/16

FINAL
As Applicable

PROJECT MAP

DEPARTMENT OF THE ARMY
USING SERVICE U.S. ARMY

LOCATION OF PROJECT

STATE CALIFORNIA
COUNTY SACRAMENTO
DIVISION SOUTH PACIFIC DIVSION (SPD)
DISTRICT SACRAMENTO (SPK)
ARMY AREA 6TH ARMY
20 Miles S.W. OF ROSEVILLE
OF

TRANSPORTATION FACILITIES

STATE ROADS US HWY 5 & 80
FEDERAL ROADS STATE HWY 80
AIRPORTS SACRAMENTO INT. AIR. (SMF)

ACQUISITION

TOTAL ACRES ACQUIRED NO AREA
FEE
PUBLIC DOMAIN (WITHDRAWN / USE PERMIT)
USE PERMIT (Other than P.D.)
TRANSFER (WITHDRAWN / USE PERMIT)
LEASE
EASEMENT RESERVED IN FEE DISPOSAL
LESSER INTERESTS (EASEMENT / PERMIT / LICENSE)

DISPOSAL

TOTAL ACRES DISPOSED NO AREA
SOLD
PUBLIC DOMAIN (WITHDRAWN / USE PERMIT)
USE PERMIT (Other than P.D.)
TRANSFERRED (FEE)
LEASES TERMINATED
LESSER INTERESTS TERM
REASSIGNED
ACRES TO

LEGEND

EXCEPT FOR SPECIAL SYMBOLS SHOWN BELOW, MAP SYMBOLS ARE STANDARD IN U.S. ARMY FIELD MANUAL, FM 21-31, TOPOGRAPHIC SYMBOLS, DEC. 1968.

- Parcel
- FPLE
- PRE
- TWAE
- Staging

Special notes:

1) This information is NOT intended as a substitute for a field survey by a licensed professional, or an application that requires legal or engineering accuracy.
2) Parcel boundary data is only a representation of ground features projected on to the Earth's surface by computer programs from raw data obtained from local government agencies and is not necessarily in whole, or in part, based upon any physical survey, study, or recording, professional or otherwise, of the covered properties.

REAL ESTATE OWNERSHIP/ESTATE MAP

DEPARTMENT OF THE ARMY
OFFICE OF THE SACRAMENTO DISTRICT ENGINEER
SOUTH PACIFIC DIVSION

CARTOGRAPHER J. HENRIKSEN
CARTO TECH.
CHECKED BY

SACRAMENTO COUNTY
CALIFORNIA

REAL ESTATE DIVISION

ARCF Project, REACH I
CONTRACT 2- Natomas Basin

SUBMITTED BY
STEVE J. CAREY
LEAD, CADASTRAL GROUP

RECOMMENDED BY
JAMES OLIVER
CHIEF, GIS & MAPPING SECTION

APPROVED BY STEVE GLADWELL
CHIEF, GEOTECH DIVISION
DATE

OFFICE, CHIEF OF ENGINEERS, WASHINGTON 25, D.C.
REMIS CODE:
REMIS UNIQUE ID:
INSTALLATION OR PROJECT #

Date Saved: 1/31/2017 8:52:17 AM
This sheet originally formatted to ANSI D, 22"X34".

SHEET 12 OF 13
DRAWING NO.

(Ver. Mar 17, 2016)

ER 405-1-200

Eng_Form 1456A, Oct 81

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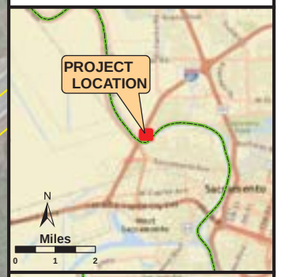
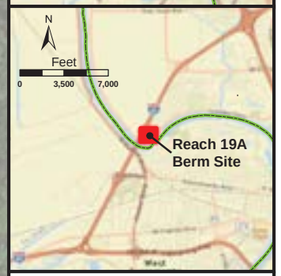
Plate 4





MARGINALIA

N

Feet

0 25 50 100 150

1 inch = 50 feet

Coordinate System:
NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

ACQUISITION AUTHORIZATION

Estates created using Eng. Division Civil Design drawing: C-203.dwg, 08/29/16

Special notes:

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FINAL
As Applicable

PROJECT MAP

DEPARTMENT OF THE: ARMY
USING SERVICE: U.S. ARMY

LOCATION OF PROJECT

STATE: CALIFORNIA
COUNTY: SACRAMENTO
DIVISION: SOUTH PACIFIC DIVSION (SPD)
DISTRICT: SACRAMENTO (SPK)
ARMY AREA: 6TH ARMY
2.9 Miles W.N.W. OF SACRAMENTO
OF

TRANSPORTATION FACILITIES

STATE ROADS: US HWY 5 & 80
FEDERAL ROADS: STATE HWY 80
AIRPORTS: SACRAMENTO INT. AIR. (SMF)

ACQUISITION

TOTAL ACRES ACQUIRED: NO AREA
FEE
PUBLIC DOMAIN: WITHDRAWN / USE PERMIT
USE PERMIT (Other than P.D.)
TRANSFER: WITHDRAWN / USE PERMIT
LEASE
EASEMENT RESERVED IN FEE DISPOSAL
LESSER INTERESTS: EASEMENT / PERMIT / LICENSE

DISPOSAL

TOTAL ACRES DISPOSED: NO AREA
SOLD
PUBLIC DOMAIN: WITHDRAWN / USE PERMIT
USE PERMIT (Other than P.D.)
TRANSFERRED: FEE
LEASES TERMINATED
LESSER INTERESTS TERM
REASSIGNED
ACRES TO

LEGEND

EXCEPT FOR SPECIAL SYMBOLS SHOWN BELOW, MAP SYMBOLS ARE STANDARD IN U.S. ARMY FIELD MANUAL, FM 21-31, TOPOGRAPHIC SYMBOLS, DEC. 1968.

- Parcel
- FPLE (Reach 19A Berm)
- Haul Route

REAL ESTATE OWNERSHIP/ESTATE MAP

DEPARTMENT OF THE ARMY
OFFICE OF THE SACRAMENTO DISTRICT ENGINEER
SOUTH PACIFIC DIVSION

CARTOGRAPHER: J. HENRIKSEN
CARTO TECH.
CHECKED BY

SACRAMENTO COUNTY — CALIFORNIA

REAL ESTATE DIVISION

ARCF Project, REACH I
Contract 1- Reach 19A Berm Site
- Natomas Basin

SUBMITTED BY
STEVE J. CAREY
LEAD, CADASTRAL GROUP

RECOMMENDED BY
LISA M. NG
DEPUTY CHIEF, REAL ESTATE DIVISION

APPROVED BY
DIANE M. SIMPSON
CHIEF, REAL ESTATE DIVISION
DATE

OFFICE, CHIEF OF ENGINEERS, WASHINGTON 25, D.C.
REMIS CODE:
REMIS UNIQUE ID:
INSTALLATION OR PROJECT #

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SHEET 01 OF 01
DRAWING NO.

(Ver. Mar 17, 2016)

ER 405-1-200 Eng_Form 1456A, Oct 81

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Plate 5

Special notes:

1) This information is NOT intended as a substitute for a field survey by a licensed professional, or an application that requires legal or engineering accuracy.
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MARGINALIA

Coordinate System:
NAD 1983 2011 StatePlane California II FIPS 0402 Ft US
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Units: Foot US

ACQUISITION AUTHORIZATION

Estates created using Eng. Division Civil Design drawing: 1-04-0570C-SPXX12.dwg, 08/29/16

FINAL
As Applicable

PROJECT MAP

DEPARTMENT OF THE ARMY
USING SERVICE U.S. ARMY

LOCATION OF PROJECT

STATE CALIFORNIA
COUNTY SACRAMENTO
DIVISION SOUTH PACIFIC DIVSION (SPD)
DISTRICT SACRAMENTO (SPK)
ARMY AREA 6TH ARMY
7.5 Miles N.W. OF SACRAMENTO
OF

TRANSPORTATION FACILITIES

STATE ROADS US HWY 5 & 80
FEDERAL ROADS STATE HWY 80
AIRPORTS SACRAMENTO INT. AIR. (SMF)

ACQUISITION

TOTAL ACRES ACQUIRED NO AREA
FEE
PUBLIC DOMAIN (WITHDRAWN / USE PERMIT)
USE PERMIT (Other than P.D.)
TRANSFER (WITHDRAWN / USE PERMIT)
LEASE
EASEMENT RESERVED IN FEE DISPOSAL
LESSER INTERESTS (EASEMENT / PERMIT / LICENSE)

DISPOSAL

TOTAL ACRES DISPOSED NO AREA
SOLD
PUBLIC DOMAIN (WITHDRAWN / USE PERMIT)
USE PERMIT (Other than P.D.)
TRANSFERRED (FEE)
LEASES TERMINATED
LESSER INTERESTS TERM
REASSIGNED
ACRES TO

LEGEND

EXCEPT FOR SPECIAL SYMBOLS SHOWN BELOW, MAP SYMBOLS ARE STANDARD IN U.S. ARMY FIELD MANUAL, FM 21-31, TOPOGRAPHIC SYMBOLS, DEC. 1968.

- Parcel
- Hewitt Disp Site
- Haul Route

REAL ESTATE OWNERSHIP/ESTATE MAP

DEPARTMENT OF THE ARMY
OFFICE OF THE SACRAMENTO DISTRICT ENGINEER
SOUTH PACIFIC DIVSION

CARTOGRAPHER J. HENRIKSEN
CARTO TECH.
CHECKED BY

SUBMITTED BY
STEVE J. CAREY
LEAD, CADASTRAL GROUP

RECOMMENDED BY
LISA M. NG
DEPUTY CHIEF, REAL ESTATE DIVISION

SACRAMENTO COUNTY — CALIFORNIA

REAL ESTATE DIVISION

ARCF Project, REACH I
Contract 1- Hewitt Disposal Site
- Natomas Basin

APPROVED BY
DIANE M. SIMPSON
CHIEF, REAL ESTATE DIVISION
DATE

OFFICE, CHIEF OF ENGINEERS, WASHINGTON 25, D.C.
REMIS CODE:
REMIS UNIQUE ID:
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Appendix B. Biological Resources Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
08ESMF00-
2010-F-0949-R002

AUG 1 1 2016

Ms. Alicia E. Kirchner
Chief, Planning Division
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814

Subject: Reinitiation of Formal Consultation on the Natomas Levee Improvement Program's Landside Improvements Phase 4b Project, Sacramento and Sutter Counties, California

Dear Ms. Kirchner:

This is in response to your June 20, 2016, request to reinitiate formal consultation with the U.S. Fish and Wildlife Service (Service) on the Natomas Levee Improvement Program (NLIP), Landside Improvements Project, Phase 4b (Phase 4b) in Sacramento and Sutter Counties, California. Your request was received in our office on June 22, 2016. The Phase 4b biological opinion (81420-2010-F-0949-1) was completed on October 12, 2010, amended on December 8, 2014, and tiered off a programmatic biological opinion (81420-2008-F-0195-5) for the entire NLIP project that was issued on October 9, 2008. The U.S. Army Corps of Engineers (Corps) has requested to reinitiate consultation on Phase 4b due to changes to the project description and in order to analyze effects to the federally listed as threatened western yellow-billed cuckoo (*Coccyzus americanus*) and endangered least Bell's vireo (*Vireo bellii pusillus*). In order for plans and specifications for the project to proceed, the Corps must conduct geotechnical borings. While this activity was included in the previous consultation, it was described as occurring during the active season of the federally-threatened giant garter snake (*Thamnophis gigas*). The Corps is now proposing to conduct geotechnical borings during the inactive season (October thru April). This biological opinion is issued under the authority of section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

This biological opinion is based on: (1) your June 20, 2016, biological assessment requesting reinitiation; (2) electronic mail sent from the Corps to the Service; and (3) other information available to the Service.

To provide ease of reading, language changed within a paragraph from the original biological opinion will be underlined. Therefore, the Phase 4b biological opinion is now amended as follows:

Page 2: Add the following paragraph just before **Consultation History for Phase 4b**:

Western Yellow-Billed Cuckoo

Nesting habitat for the yellow-billed cuckoo is comprised of large areas (at least 50 acres) of riparian habitat composed of cottonwood and willow trees. Due to the urbanization of the Sacramento area large amounts of riparian habitat have been lost along the Sacramento River. However, habitat does occur within the surrounding area along the lower American River and in the Yolo Bypass. Yellow-billed cuckoos have been observed along the lower American River as close as 3 miles to the action area in 2013 and 2015. Currently habitat in the action area exists on levees and consists of narrow, poorly connected habitat patches. It is unlikely that cuckoos would use this habitat for nesting. However, cuckoos could use the woody vegetation as stopover habitat during their spring migration to areas further north in the Sacramento Valley. The Corps has proposed to remove vegetation during the non-breeding season in order to avoid disturbing any birds that may be migrating through the area. The Corps will continue creating a woodland corridor on the western portion of the Natomas Basin as it parallels the Sacramento River. The project will double the amount of vegetation that is being removed through the creation of the corridor. Because there is other available habitat for the cuckoo to use during its migration and the habitat will be replaced, the Service concurs with the Corps finding of may affect, not likely to adversely affect the yellow-billed cuckoo.

Least Bell's Vireo

Least Bell's vireo uses early successional, dense, variable height structure, riparian habitat for nesting and foraging. While this habitat exists just outside the action area, construction will not occur in suitable nesting habitat for the vireo. Woody vegetation exists on the levee and landside toe, but is maintained for an open understory in order to conduct levee inspections. Vegetation in the action area will be removed prior to March when birds begin to migrate into California. Dense riparian habitat is available for the vireo in the lower American River Parkway as well as in the Yolo Bypass. There have been a small number of least Bell's vireo observed in the Yolo Bypass and in southern Sacramento County at the Bufferlands, however there are no known recent occurrences of breeding of least Bell's vireo in the Sacramento Valley. Given the recent occurrences 2010, 2011, and 2013 (eBird 2016) in the surrounding area it is possible that over the course of the project timeframe vireos may use the surrounding area more frequently. However, the habitat quality makes it unlikely that they would use the riparian vegetation that is being removed as part of the project. The Corps is planning to continue creating a woodland corridor on the western portion of the Natomas Basin as it parallels the Sacramento River. The project will double the amount of vegetation that is being removed through the creation of the corridor. Given the avoidance measures that the Corps intends to include (vegetation removal prior to the nesting season) and the few occurrences in the Sacramento Valley, the Service believes that adverse effects to the least Bell's vireo are unlikely to occur, and are therefore discountable for the purposes of this consultation.

Page 2: Add the following under **Consultation History for Phase 4b:**

June 20, 2016. The Corps reinitiated section 7 consultation on Phase 4b due to changes in the project description and an analysis for western yellow-billed cuckoo and least Bell's vireo.

Page 5: Add the following paragraph in the **Project Description** under **Levee Modifications and Seepage Remediation**:

Eighty geotechnical borings will be conducted along Reaches E, F, and G in order to identify utilities and refine final designs of the project. All of the borings will be done with a drill rig and occur between November and March of 2016/2017 in upland giant garter snake habitat.

Page 8: Add the following paragraph under **American River North Levee Reach I: 1-4**:

A portion of Discovery Park will serve as a staging area for construction of Reach I. The levee crown will also serve as additional staging areas during construction. No woody vegetation will be removed in the staging area. The area is currently in annual grassland.

Page 10: Add the following paragraph under **Natomas East Main Drainage Canal West Levee, Reaches F-H**:

Staging for Reach H will occur on both the landside and the waterside toe of the levee. The waterside staging will occur between the West El Camino and San Juan Bridges. It is a large annual grassland and will be used for soil storage. Storm water pollution prevention measures will be installed, including sediment fencing which will prevent spills of soil into the channel. Due to high amounts of urbanization on the landside of the levee and presence of woody vegetation along the channel it is unlikely that giant garter snakes will use this portion of the Natomas East Main Drainage Canal.

Page 33: Change the following paragraph in the **Conservation Measures** under *Giant Garter Snake* from:

Some components of the proposed project may occur prior to the beginning of the defined GGS active season. Activities such as utility relocations, removal of residential or agricultural structures, or certain geotechnical borings (38 borings along the NEMDC between the American River Parkway and the Pump Station) will be conducted before May 1. Typically, this work will occur farther than 200 feet from suitable aquatic habitat for GGS or in areas unsuitable for estivation such as roads. Twenty-seven hand borings will occur in areas where GGS may be overwintering. A Corps biologist will survey the area prior to hand boring site selection. Boring locations will be selected that are at least 30 feet from any crack or burrow in the levee that could be used by the snake for overwintering. A biologist will be present on site during boring activities occurring outside the active season of the GGS. All other borings will occur between May 1 and October 1.

To:

Some components of the proposed project may occur prior to the beginning of the defined GGS active season. Activities such as utility relocations, removal of residential or agricultural structures, or certain geotechnical borings (38 borings along the NEMDC between the American River Parkway and the Pump Station and 80 borings along the Reaches E, F, and G) will be conducted before May 1. Typically, this work will occur farther than 200 feet from suitable aquatic habitat for GGS or in areas unsuitable for estivation such as roads. Twenty-seven hand borings and 80 drill rig borings will occur in areas where GGS may be overwintering. A Corps biologist will survey the area prior to hand boring site selection. Boring locations will be selected that are at least 30 feet from any crack or burrow in the levee that could be used by the snake for overwintering. A biologist will be present on-site during boring activities occurring outside the active season of the GGS. All other borings will occur between May 1 and October 1.

Page 38: Change the following paragraph in the **Effects of the Project** under Giant Garter Snake from:

Components of Phase 4b work that will occur outside of the GGS's active season include utility relocation, removal of residential or agricultural structures, and transplantation and planting of trees and elderberry shrubs. These will be conducted before April 15. GGS have been observed to overwinter as far as 250 meters from aquatic habitat (Wylie *et al.* 1997). Given that GGS are generally inactive during the winter months, SAFCA's working during the inactive season will kill GGS that may be overwintering within the construction footprint. To reduce disturbing and/or killing GGS that may be overwintering due to the 38 borings the Corps/SAFCA will have a biologist survey the proposed hand auger site and select sites that are at least 30 feet from a crack or burrow that could be used by an overwintering GGS. This should reduce the likelihood of the hand augering killing or injuring an overwintering snake. For other activities, to reduce disturbing and/or killing GGS that may be overwintering in uplands that will be affected by working out of season, SAFCA has proposed to place exclusionary fencing which will be erected prior to October 1 in areas in which GGS may overwinter and SAFCA is proposing to remove/plant trees or elderberries. The fencing will exclude GGS from entering the area where SAFCA will be construction during the winter. This fence will be monitored daily prior to and during construction to insure that there are no breaches that a snake could get through. Excluding snakes from these areas will affect the GGS by limiting its ability to utilize suitable upland habitat for winter hibernation and by changing its dispersal behavior. Increased construction activity in areas where GGS are known to occur could expose snakes to increased risks of injury and mortality from predation, exposure, vehicular traffic, and construction equipment. It may be forced to disperse through and/or around the construction sites in response to habitat changes and seasonal indicators at a time when snakes are slower moving due to temperatures. Areas that are unlikely to have overwintering GGS include areas, which have active construction or agricultural activities occurring on them.

To:

Components of Phase 4b work that will occur outside of the GGS's active season include utility relocation, removal of residential or agricultural structures, and transplantation and planting of trees and elderberry shrubs. These will be conducted before April 15. GGS have been observed to overwinter as far as 250 meters from aquatic habitat (Wylie *et al.* 1997). Given that GGS are generally inactive during the winter months, SAFCA's working during the inactive season will kill GGS that may be overwintering within the construction footprint. To reduce disturbing and/or killing GGS that may be overwintering due to the 118 borings, the Corps/SAFCA will have a biologist survey the proposed hand auger site and select sites that are at least 30 feet from a crack or burrow that could be used by an overwintering GGS. This should reduce the likelihood of the hand augering killing or injuring an overwintering snake. For other activities, to reduce disturbing and/or killing GGS that may be overwintering in uplands that will be affected by working out of season, SAFCA has proposed to place exclusionary fencing which will be erected prior to October 1 in areas in which GGS may overwinter and SAFCA is proposing to remove/plant trees or elderberries. The fencing will exclude GGS from entering the area where SAFCA will be construction during the winter. This fence will be monitored daily prior to and during construction to insure that there are no breaches that a snake could get through. Excluding snakes from these areas will affect the GGS by limiting its ability to utilize suitable upland habitat for winter hibernation and by changing its dispersal behavior. Increased construction activity in areas where GGS are known to occur could expose snakes to increased risks of injury and mortality from predation, exposure, vehicular traffic, and construction equipment. It may be forced to disperse through and/or around the construction sites in response to habitat changes and seasonal indicators at a time when snakes are slower moving

due to temperatures. Areas that are unlikely to have overwintering GGS include areas, which have active construction or agricultural activities occurring on them.

Page 48: Add the following to the Literature Cited:

eBird. 2016. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: August 10, 2016).

The remaining portions of the December 8, 2014, biological opinion remain the same. This concludes formal consultation with the Corps on the Natomas Levee Improvement Program, Landside Improvements Phase 4b Project. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the proposed action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (4) a new species or critical habitat is designated that may be affected by the proposed action.

If you have any questions regarding this biological opinion on the Natomas Landside Improvements Project, please contact Jennifer Hobbs (Jennifer_hobbs@fws.gov), Senior Fish and Wildlife Biologist at (916) 414-6541.

Sincerely,

Doug Weinrich

Jennifer M. Norris
Field Supervisor

cc:
Robin Rosenau, Corps, Sacramento, CA
Tanya Sheya, CDFW, Rancho Cordova, CA
Peter Buck, SAFCA, Sacramento, CA

Appendix C. Air Quality Modeling Data

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	10.44	68.63	105.83	25.77	5.77	20.00	9.56	5.40	4.16	0.10	10,456.51	2.41	0.10	10,545.85
Grading/Excavation	6.84	47.51	70.54	24.02	4.02	20.00	7.85	3.69	4.16	0.08	8,532.21	1.80	0.11	8,610.32
Drainage/Utilities/Sub-Grade	5.66	38.92	58.68	23.42	3.42	20.00	7.29	3.13	4.16	0.06	6,581.18	1.82	0.07	6,646.79
Paving	4.36	31.08	42.38	2.61	2.61	0.00	2.41	2.41	0.00	0.05	5,473.65	1.10	0.07	5,521.00
Maximum (pounds/day)	16.86	117.51	171.60	50.05	10.05	40.00	17.56	9.24	8.32	0.20	20,587.04	4.72	0.25	20,778.10
Total (tons/construction project)	0.72	5.01	7.42	2.34	0.42	1.92	0.79	0.39	0.40	0.01	884.62	0.19	0.01	892.67

Notes:

Project Start Year ->	2017
Project Length (months) ->	9
Total Project Area (acres) ->	10
Maximum Area Disturbed/Day (acres) ->	2
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	100	50	50	50	200	0
Grading/Excavation	100	50	200	200	200	0
Drainage/Utilities/Sub-Grade	50	20	50	50	200	0
Paving	50	60	100	100	200	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP). 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.06	0.41	0.63	0.15	0.03	0.12	0.06	0.03	0.02	0.00	62.74	0.01	0.00	57.40
Grading/Excavation	0.57	3.99	5.93	2.02	0.34	1.68	0.66	0.31	0.35	0.01	716.71	0.15	0.01	656.14
Drainage/Utilities/Sub-Grade	0.03	0.23	0.35	0.14	0.02	0.12	0.04	0.02	0.02	0.00	39.49	0.01	0.00	36.18
Paving	0.06	0.37	0.51	0.03	0.03	0.00	0.03	0.03	0.00	0.00	65.68	0.01	0.00	60.10
Maximum (tons/phase)	0.57	3.99	5.93	2.02	0.34	1.68	0.66	0.31	0.35	0.01	716.71	0.15	0.01	656.14
Total (tons/construction project)	0.72	5.01	7.42	2.34	0.42	1.92	0.79	0.39	0.40	0.01	884.62	0.19	0.01	809.83

Notes:

Project Start Year ->	2017
Project Length (months) ->	9
Total Project Area (acres) ->	10
Maximum Area Disturbed/Day (acres) ->	2
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	100	50	50	50	200	0
Grading/Excavation	100	50	200	200	200	0
Drainage/Utilities/Sub-Grade	50	20	50	50	200	0
Paving	50	60	100	100	200	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP). 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.
The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model
Data Entry Worksheet

Version 8.1.0

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through F35, and D38 through D41 for all project typ
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new proje

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name		
Construction Start Year	2017	Enter a Year between 2014 and 2025 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee constructi
Project Construction Time	9.00	months
Working Days per Month	24.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise, see instructions provided in cells J18 to M25)	2	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	5.00	miles
Total Project Area	10.00	acres
Maximum Area Disturbed/Day	2.00	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd³) (assume 20 if unknown)	Import Volume (yd³/day)	Export Volume (yd³/day)
Soil	Grubbing/Land Clearing	13.00	0.00	100.00
	Grading/Excavation	13.00	50.00	50.00
	Drainage/Utilities/Sub-Grade	13.00	10.00	40.00
	Paving	13.00	10.00	40.00
Asphalt	Grubbing/Land Clearing	13.00	0.00	50.00
	Grading/Excavation	13.00	0.00	50.00
	Drainage/Utilities/Sub-Grade	13.00	10.00	10.00
	Paving	13.00	50.00	10.00

5

Mitigation Options

On-road Fleet Emissions Mitigation	No Mitigation	Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation	No Mitigation	Select "20% NOx and 45% Exhaust PM reduction" option if the off-road construction fleet meets the emission standards determined using the SMAQMD Construction Mitigation Calculator (http://www.airquality.org/ceqa/mitigation.shtml) Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets EPA Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selecte

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.50	0.50	4/15/2017	1/1/2017
Grading/Excavation	7.30	4.05	5/15/2017	1/17/2017
Drainage/Utilities/Sub-Grad	0.50	2.70	9/15/2017	5/18/2017
Paving	1.00	1.35	11/15/2017	6/3/2017
Totals (Months)		9		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F

Soil Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
User Input					
Miles/round trip: Grubbing/Land Clearing	5.00		10.00		50.00
Miles/round trip: Grading/Excavation	20.00		10.00		200.00
Miles/round trip: Drainage/Utilities/Sub-Grad	5.00		10.00		50.00
Miles/round trip: Paving	10.00		10.00		100.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Grading/Excavation (grams/mile	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Draining/Utilities/Sub-Grade (grams/mile	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Paving (grams/mile)	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Hauling Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearin	0.02	0.08	0.72	0.02	0.01	0.00	185.64	0.00	0.01	187.54
Tons per const. Period - Grubbing/Land Clearin	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	1.13
Pounds per day - Grading/Excavatio	0.09	0.33	2.88	0.07	0.05	0.01	742.57	0.00	0.03	750.15
Tons per const. Period - Grading/Excavatio	0.01	0.03	0.24	0.01	0.00	0.00	62.38	0.00	0.00	63.01
Pounds per day - Drainage/Utilities/Sub-Grade	0.02	0.08	0.72	0.02	0.01	0.00	185.64	0.00	0.01	187.54
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	1.13
Pounds per day - Paving	0.05	0.16	1.44	0.04	0.02	0.00	371.29	0.00	0.01	375.07
Tons per const. Period - Paving	0.00	0.00	0.02	0.00	0.00	0.00	4.46	0.00	0.00	4.50
Total tons per construction project	0.01	0.03	0.27	0.01	0.00	0.00	68.06	0.00	0.00	68.76

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F

Asphalt Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
User Input					
Miles/round trip: Grubbing/Land Clearin	5.00		10.00		50.00
Miles/round trip: Grading/Excavatio	20.00		10.00		200.00
Miles/round trip: Drainage/Utilities/Sub-Grad	5.00		10.00		50.00
Miles/round trip: Paving	10.00		10.00		100.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Grading/Excavation (grams/mile	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Draining/Utilities/Sub-Grade (grams/mile	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Paving (grams/mile)	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearin	0.02	0.08	0.72	0.02	0.01	0.00	185.64	0.00	0.01	187.54
Tons per const. Period - Grubbing/Land Clearin	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	1.13
Pounds per day - Grading/Excavatio	0.09	0.33	2.88	0.07	0.05	0.01	742.57	0.00	0.03	750.15
Tons per const. Period - Grading/Excavatio	0.01	0.03	0.24	0.01	0.00	0.00	62.38	0.00	0.00	63.01
Pounds per day - Drainage/Utilities/Sub-Grad	0.02	0.08	0.72	0.02	0.01	0.00	185.64	0.00	0.01	187.54
Tons per const. Period - Drainage/Utilities/Sub-Grad	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	1.13
Pounds per day - Paving	0.05	0.16	1.44	0.04	0.02	0.00	371.29	0.00	0.01	375.07
Tons per const. Period - Paving	0.00	0.00	0.02	0.00	0.00	0.00	4.46	0.00	0.00	4.50
Total tons per construction projec	0.01	0.03	0.27	0.01	0.00	0.00	68.06	0.00	0.00	68.76

Note: Worker commute default values can be overridden in cells D13 through D17

Worker Commute Emissions	User Override of Worker Commute Default Value	Default Value		
User Input			Calculated Daily Trips	Calculated Daily VMT
Miles/ one-way trip	10.00			
One-way trips/day	2.00			
No. of employees: Grubbing/Land Clearin	10.00		20.00	200.00
No. of employees: Grading/Excavatio	10.00		20.00	200.00
No. of employees: Drainage/Utilities/Sub-Grad	10.00		20.00	200.00
No. of employees: Paving	10.00		20.00	200.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile	0.04	1.51	0.17	0.05	0.02	0.00	403.73	0.01	0.01	406.12
Grading/Excavation (grams/mile	0.04	1.51	0.17	0.05	0.02	0.00	403.73	0.01	0.01	406.12
Draining/Utilities/Sub-Grade (grams/mile	0.04	1.51	0.17	0.05	0.02	0.00	403.73	0.01	0.01	406.12
Paving (grams/mile)	0.04	1.51	0.17	0.05	0.02	0.00	403.73	0.01	0.01	406.12
Grubbing/Land Clearing (grams/trip	1.28	3.62	0.30	0.00	0.00	0.00	89.60	0.02	0.01	93.75
Grading/Excavation (grams/trip	1.28	3.62	0.30	0.00	0.00	0.00	89.60	0.02	0.01	93.75
Draining/Utilities/Sub-Grade (grams/trip	1.28	3.62	0.30	0.00	0.00	0.00	89.60	0.02	0.01	93.75
Paving (grams/trip)	1.28	3.62	0.30	0.00	0.00	0.00	89.60	0.02	0.01	93.75
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearin	0.07	0.83	0.09	0.02	0.01	0.00	181.97	0.01	0.00	183.20
Tons per const. Period - Grubbing/Land Clearin	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	1.10
Pounds per day - Grading/Excavatio	0.07	0.83	0.09	0.02	0.01	0.00	181.97	0.01	0.00	183.20
Tons per const. Period - Grading/Excavatio	0.01	0.07	0.01	0.00	0.00	0.00	15.29	0.00	0.00	15.39
Pounds per day - Drainage/Utilities/Sub-Grad	0.07	0.83	0.09	0.02	0.01	0.00	181.97	0.01	0.00	183.20
Tons per const. Period - Drainage/Utilities/Sub-Grad	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	1.10
Pounds per day - Paving	0.07	0.83	0.09	0.02	0.01	0.00	181.97	0.01	0.00	183.20
Tons per const. Period - Paving	0.00	0.01	0.00	0.00	0.00	0.00	2.18	0.00	0.00	2.20
Total tons per construction projec	0.01	0.09	0.01	0.00	0.00	0.00	19.65	0.00	0.00	19.79

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT
User Input					
Grubbing/Land Clearing - Exhaust	2.00				0.00
Grading/Excavation - Exhaust	1.00				0.00
Drainage/Utilities/Subgrade	1.00				0.00
Paving	1.00				0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Grading/Excavation (grams/mile	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Draining/Utilities/Sub-Grade (grams/mile	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Paving (grams/mile)	0.20	0.74	6.54	0.17	0.10	0.02	1,684.12	0.01	0.06	1,701.31
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavatio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavatio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearin			20.00	0.12	4.16	0.02
Fugitive Dust - Grading/Excavation			20.00	1.68	4.16	0.35
Fugitive Dust - Drainage/Utilities/Subgrad			20.00	0.12	4.16	0.02

Values in cells C183 through D216, C234 through D367, C285 through D318, and D336 through D369 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles Program-estimate	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.44	2.49	2.91	0.23	0.23	0.00	375.25	0.04	0.00	377.10
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Concrete/Industrial Saws	1.16	7.50	8.52	0.61	0.61	0.01	1,185.33	0.10	0.01	1,190.55
1.00			Model Default Tier	Cranes	0.65	2.76	7.69	0.34	0.32	0.01	577.24	0.18	0.00	583.13
2.00			Model Default Tier	Crawler Tractors	1.36	5.50	16.17	0.69	0.64	0.02	1,576.92	0.48	0.01	1,593.02
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.36	3.44	4.04	0.20	0.18	0.01	544.60	0.17	0.00	550.17
2.00			Model Default Tier	Forklifts	0.42	2.50	3.65	0.30	0.28	0.00	312.51	0.10	0.00	315.70
2.00			Model Default Tier	Generator Sets	1.14	7.55	8.93	0.60	0.60	0.01	1,246.07	0.10	0.01	1,251.38
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Other Construction Equipment	1.28	8.51	14.00	0.74	0.68	0.01	1,263.73	0.39	0.01	1,276.66
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Rubber Tired Dozers	2.28	19.88	26.39	1.23	1.13	0.02	1,820.02	0.55	0.02	1,838.54
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.37	2.03	3.13	0.27	0.25	0.00	259.85	0.08	0.00	262.50
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.64	4.84	6.15	0.46	0.43	0.01	643.09	0.20	0.01	649.65
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	10.32	67.64	104.30	5.71	5.37	0.10	9,903.26	2.40	0.08	9,987.57
Grubbing/Land Clearing	tons per phase	0.06	0.41	0.63	0.03	0.03	0.00	59.42	0.01	0.00	59.93

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles Program-estimate	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Cement and Mortar Mixers	0.12	0.62	0.74	0.03	0.03	0.00	101.33	0.01	0.00	101.55
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Excavators	0.73	5.88	8.08	0.40	0.37	0.01	1,089.21	0.33	0.01	1,100.33
2.00			Model Default Tier	Forklifts	0.42	2.50	3.65	0.30	0.28	0.00	312.51	0.10	0.00	315.70
2.00			Model Default Tier	Generator Sets	1.14	7.55	8.93	0.60	0.60	0.01	1,246.07	0.10	0.01	1,251.38
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Model Default Tier	Other Construction Equipment	2.55	17.01	28.00	1.48	1.36	0.02	2,527.45	0.77	0.02	2,553.31
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Other Material Handling Equipment	0.50	3.95	5.29	0.28	0.26	0.01	587.25	0.18	0.01	593.25
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.37	2.08	3.13	0.27	0.25	0.00	259.85	0.08	0.00	262.50
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.64	4.84	6.15	0.46	0.43	0.01	643.09	0.20	0.01	649.65
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	6.59	46.03	64.69	3.85	3.59	0.07	6,865.10	1.78	0.06	6,926.81
Grading/Excavation	tons per phase	0.55	3.87	5.43	0.32	0.30	0.01	575.67	0.15	0.00	581.85

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles Program-estimate	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Bore/Drill Rigs	0.32	2.00	4.58	0.13	0.12	0.01	897.56	0.28	0.01	906.85
2.00			Model Default Tier	Cement and Mortar Mixers	0.12	0.62	0.74	0.03	0.03	0.00	101.03	0.01	0.00	101.55
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.36	3.44	4.04	0.20	0.18	0.01	544.60	0.17	0.00	550.17
2.00			Model Default Tier	Forklifts	0.42	2.50	3.65	0.30	0.28	0.00	312.51	0.10	0.00	315.70
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Model Default Tier	Other Construction Equipment	2.56	17.01	28.00	1.48	1.36	0.02	2,527.46	0.77	0.02	2,553.31
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.37	2.08	3.13	0.27	0.25	0.00	259.65	0.08	0.00	262.50
4.00			Model Default Tier	Tractors/Loaders/Backhoes	1.28	9.67	12.30	0.92	0.85	0.01	1,286.19	0.39	0.01	1,299.30
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' t

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	5.54	37.93	57.16	3.36	3.10	0.05	6,027.92	1.81	0.05	6,088.51
Drainage/Utilities/Sub-Grade	tons per phase	0.00	0.23	0.34	0.02	0.02	0.00	36.17	0.01	0.00	35.53

Paving Override of Default Number of Vehicles	Default Number of Vehicles Program-estimate	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Generator Sets	1.14	7.55	6.93	0.60	0.60	0.01	1,246.07	0.10	0.01	1,251.38
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Pavers	0.73	5.72	8.13	0.40	0.37	0.01	931.42	0.29	0.01	940.93
2.00			Model Default Tier	Paving Equipment	0.57	5.11	6.48	0.32	0.30	0.01	827.02	0.25	0.01	835.47
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Rollers	0.63	4.03	5.88	0.43	0.39	0.01	543.03	0.17	0.00	548.57
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.37	2.08	3.13	0.27	0.25	0.00	259.85	0.08	0.00	262.53
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.64	4.84	6.15	0.45	0.43	0.01	643.09	0.20	0.01	649.65
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment — If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' t

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Paving	pounds per day	4.19	29.93	39.41	2.51	2.36	0.05	4,549.11	1.09	0.04	4,587.64
Paving	tons per phase	0.05	0.36	0.47	0.03	0.03	0.00	54.59	0.01	0.00	55.05
Total Emissions all Phases (tons per construction period) =		0.70	4.86	6.88	0.41	0.38	0.01	726.85	0.19	0.01	733.36

Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F4

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		205		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		125		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	10.41	68.54	83.87	23.18	3.18	20.00	7.13	2.97	4.16	0.10	10,438.90	2.41	0.10	10,527.94
Grading/Excavation	6.72	47.16	53.20	22.23	2.23	20.00	6.18	2.02	4.16	0.08	8,461.78	1.79	0.11	8,538.67
Drainage/Utilities/Sub-Grade	5.63	38.83	46.15	21.89	1.89	20.00	5.88	1.72	4.16	0.06	6,563.57	1.81	0.07	6,628.87
Paving	4.30	30.91	32.29	1.45	1.45	0.00	1.32	1.32	0.00	0.05	5,438.44	1.10	0.06	5,485.17
Maximum (pounds/day)	16.64	116.91	131.64	45.57	5.57	40.00	13.39	5.07	8.32	0.20	20,483.79	4.71	0.24	20,652.71
Total (tons/construction project)	0.71	4.98	5.64	2.16	0.24	1.92	0.61	0.21	0.40	0.01	878.07	0.19	0.01	886.01

Notes:

Project Start Year ->	2017
Project Length (months) ->	9
Total Project Area (acres) ->	10
Maximum Area Disturbed/Day (acres) ->	2
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	100	50	50	50	200	0
Grading/Excavation	100	50	200	200	200	0
Drainage/Utilities/Sub-Grade	50	20	50	50	200	0
Paving	50	60	100	100	200	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.06	0.41	0.50	0.14	0.02	0.12	0.04	0.02	0.02	0.00	62.63	0.01	0.00	57.31
Grading/Excavation	0.56	3.96	4.47	1.87	0.19	1.68	0.52	0.17	0.35	0.01	710.79	0.15	0.01	650.68
Drainage/Utilities/Sub-Grade	0.03	0.23	0.26	0.13	0.01	0.12	0.04	0.01	0.02	0.00	39.38	0.01	0.00	36.08
Paving	0.05	0.37	0.39	0.02	0.02	0.00	0.02	0.02	0.00	0.00	65.26	0.01	0.00	59.71
Maximum (tons/phase)	0.56	3.96	4.47	1.87	0.19	1.68	0.52	0.17	0.35	0.01	710.79	0.15	0.01	650.68
Total (tons/construction project)	0.71	4.98	5.64	2.16	0.24	1.92	0.61	0.21	0.40	0.01	878.07	0.19	0.01	803.78

Notes:

Project Start Year ->	2017
Project Length (months) ->	9
Total Project Area (acres) ->	10
Maximum Area Disturbed/Day (acres) ->	2
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	100	50	50	50	200	0
Grading/Excavation	100	50	200	200	200	0
Drainage/Utilities/Sub-Grade	50	20	50	50	200	0
Paving	50	60	100	100	200	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model

Version 8.1.0

Data Entry Worksheet

Note: Required data input sections have a yellow background
Optional data input sections have a blue background. Only areas with yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through F35, and D38 through D41 for all project type
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new proj

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading the spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name		
Construction Start Year	2017	Enter a Year between 2014 and 2025 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construct
Project Construction Time	9.00	months
Working Days per Month	24.00	days (assume 22 if unknown
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to N25)	2	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	5.00	miles
Total Project Area	10.00	acres
Maximum Area Disturbed/Day	2.00	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd³) (assume 20 if unknown)	Import Volume (yd³/day)	Export Volume (yd³/day)
Soil	Grubbing/Land Clearing	13.00	0.00	100.00
	Grading/Excavation	13.00	50.00	50.00
	Drainage/Utilities/Sub-Grade	13.00	10.00	40.00
	Paving	13.00	10.00	40.00
Asphalt	Grubbing/Land Clearing	13.00	0.00	50.00
	Grading/Excavation	13.00	0.00	50.00
	Drainage/Utilities/Sub-Grade	13.00	10.00	10.00
	Paving	13.00	50.00	10.00

5

Mitigation Options

On-road Fleet Emissions Mitigation	2010 and Newer On-road Vehicles Fleet	Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation	20% NOx and 45% Exhaust PM reduction	Select "20% NOx and 45% Exhaust PM reduction" option if the off-road construction fleet meets the emission standards determined using the SMAQMD Construction Mitigation Calculator (http://www.airquality.org/ceqa/mitigation.shtml) Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets EPA Tier 4 Standar

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.50	0.90	4/15/2017	1/1/2017
Grading/Excavation	7.00	4.05	5/15/2017	1/17/2017
Drainage/Utilities/Sub-Grade	0.50	2.70	10/15/2017	6/18/2017
Paving	1.00	1.35	11/15/2017	8/3/2017
Totals (Months)		9		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F

Soil Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	5.50		10.00		50.00
Miles/round trip: Grading/Excavation	20.00		13.00		200.00
Miles/round trip: Drainage/Utilities/Sub-Grade	5.00		10.00		50.00
Miles/round trip: Paving	10.00		10.00		100.00

2010+ Model Year Mitigation Option Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.35	1.54	0.10	0.04	0.02	1,504.26	0.00	0.05	1,620.06
Grading/Excavation (grams/mile)	0.07	0.35	1.54	0.10	0.04	0.02	1,504.26	0.00	0.05	1,620.06
Draining/Utilities/Sub-Grade (grams/mile)	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Paving (grams/mile)	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.01	0.04	0.17	0.01	0.00	0.00	176.84	0.00	0.01	178.58
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	1.07
Pounds per day - Grading/Excavation	0.03	0.16	0.68	0.05	0.02	0.01	707.36	0.00	0.02	714.32
Tons per const. Period - Grading/Excavation	0.00	0.01	0.06	0.00	0.00	0.00	59.42	0.00	0.00	60.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.01	0.04	0.17	0.01	0.00	0.00	176.84	0.00	0.01	178.58
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	1.07
Pounds per day - Paving	0.01	0.08	0.34	0.02	0.01	0.00	353.68	0.00	0.01	357.16
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	4.24	0.00	0.00	4.29
Total tons per construction project	0.00	0.01	0.06	0.00	0.00	0.00	65.78	0.00	0.00	66.43

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing	5.00		10.00		50.00
Miles/round trip: Grading/Excavation	20.00		10.00		200.00
Miles/round trip: Drainage/Utilities/Sub-Grade	5.00		10.00		50.00
Miles/round trip: Paving	10.00		10.00		100.00

2010+ Model Year Mitigation Option Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Grading/Excavation (grams/mile	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Drainage/Utilities/Sub-Grade (grams/mile	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Paving (grams/mile	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearin	0.01	0.04	0.17	0.01	0.00	0.00	176.84	0.00	0.01	178.58
Tons per const. Period - Grubbing/Land Clearin	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	1.07
Pounds per day - Grading/Excavatio	0.03	0.16	0.68	0.05	0.02	0.01	707.36	0.00	0.02	714.32
Tons per const. Period - Grading/Excavatio	0.00	0.01	0.05	0.00	0.00	0.00	59.42	0.00	0.00	60.00
Pounds per day - Drainage/Utilities/Sub-Grad	0.01	0.04	0.17	0.01	0.00	0.00	176.84	0.00	0.01	178.58
Tons per const. Period - Drainage/Utilities/Sub-Grad	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	1.07
Pounds per day - Paving	0.01	0.08	0.34	0.02	0.01	0.00	353.68	0.00	0.01	357.16
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	4.24	0.00	0.00	4.28
Total tons per construction projec	0.00	0.01	0.05	0.00	0.00	0.00	66.78	0.00	0.00	66.43

Note: Worker commute default values can be overridden in cells D119 through D11

Worker Commute Emissions	User Override of Worker Commute Default Value	Default Values		
User Input				
Miles/ one-way trip	10.00		Calculated	Calculated
One-way trips/day	2.00		Daily Trips	Daily VMT
No. of employees: Grubbing/Land Clearin	10.00		20.00	200.00
No. of employees: Grading/Excavatio	10.00		20.00	200.00
No. of employees: Drainage/Utilities/Sub-Grad	10.00		20.00	200.00
No. of employees: Pavin	10.00		20.00	200.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile	0.04	1.51	0.17	0.05	0.02	0.00	403.73	0.01	0.01	406.12
Grading/Excavation (grams/mile	0.04	1.51	0.17	0.05	0.02	0.00	403.73	0.01	0.01	406.12
Draining/Utilities/Sub-Grade (grams/mile	0.04	1.51	0.17	0.05	0.02	0.00	403.73	0.01	0.01	406.12
Paving (grams/mile	0.04	1.51	0.17	0.05	0.02	0.00	403.73	0.01	0.01	406.12
Grubbing/Land Clearing (grams/trip	1.28	3.62	0.30	0.00	0.00	0.00	89.60	0.02	0.01	93.79
Grading/Excavation (grams/trip	1.28	3.62	0.30	0.00	0.00	0.00	89.60	0.02	0.01	93.79
Draining/Utilities/Sub-Grade (grams/trip	1.28	3.62	0.30	0.00	0.00	0.00	89.60	0.02	0.01	93.79
Paving (grams/trip	1.28	3.62	0.30	0.00	0.00	0.00	89.60	0.02	0.01	93.79
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearin	0.07	0.83	0.09	0.02	0.01	0.00	181.97	0.01	0.00	183.20
Tons per const. Period - Grubbing/Land Clearin	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	1.10
Pounds per day - Grading/Excavatio	0.07	0.83	0.09	0.02	0.01	0.00	181.97	0.01	0.00	183.20
Tons per const. Period - Grading/Excavatio	0.01	0.07	0.01	0.00	0.00	0.00	15.29	0.00	0.00	15.39
Pounds per day - Drainage/Utilities/Sub-Grad	0.07	0.83	0.09	0.02	0.01	0.00	181.97	0.01	0.00	183.20
Tons per const. Period - Drainage/Utilities/Sub-Grad	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	1.10
Pounds per day - Pavin	0.07	0.83	0.09	0.02	0.01	0.00	181.97	0.01	0.00	183.20
Tons per const. Period - Pavin	0.00	0.01	0.00	0.00	0.00	0.00	2.18	0.00	0.00	2.20
Total tons per construction projec	0.01	0.09	0.01	0.00	0.00	0.00	19.65	0.00	0.00	19.79

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT
User Input					
Grubbing/Land Clearing - Exhaust	2.00				0.00
Grading/Excavation - Exhaust	1.00				0.00
Drainage/Utilities/Subgrade	1.00				0.00
Paving	1.00				0.00

2010+ Model Year Mitigation Option Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Grading/Excavation (grams/mile	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Draining/Utilities/Sub-Grade (grams/mile	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Paving (grams/mile	0.07	0.35	1.54	0.10	0.04	0.02	1,604.26	0.00	0.05	1,620.06
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavatio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavatio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grad	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Pavin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearin			20.00	0.12	4.16	0.03
Fugitive Dust - Grading/Excavatio			20.00	1.68	4.16	0.35
Fugitive Dust - Drainage/Utilities/Subgrad			20.00	0.12	4.16	0.03

Values in cells D183 through D216, D234 through D267, D285 through D318, and D336 through D369 are required when 'Other Project Type' is selec

Off-Road Equipment Emissions

Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Select

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles Program-estimate	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.44	2.49	2.33	0.13	0.13	0.00	375.28	0.04	0.00	377.10
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Concrete/Industrial Saws	1.16	7.50	6.82	0.34	0.34	0.01	1,185.33	0.10	0.01	1,190.55
1.00			Model Default Tier	Cranes	0.65	2.76	6.15	0.18	0.17	0.01	577.24	0.18	0.00	583.13
2.00			Model Default Tier	Crawler Tractors	1.30	5.50	14.54	0.38	0.35	0.02	1,576.92	0.48	0.01	1,593.02
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.36	3.44	3.23	0.11	0.10	0.01	544.80	0.17	0.00	550.17
2.00			Model Default Tier	Forklifts	0.42	2.50	2.92	0.17	0.15	0.00	312.51	0.10	0.00	315.70
2.00			Model Default Tier	Generator Sets	1.14	7.55	7.14	0.33	0.33	0.01	1,246.07	0.10	0.01	1,251.38
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Other Construction Equipmen	1.29	8.51	11.20	0.41	0.37	0.01	1,263.73	0.39	0.01	1,276.86
			Model Default Tier	Other General Industrial Equipmer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipmer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Rubber Tired Dozers	2.38	19.88	21.11	0.67	0.62	0.02	1,620.02	0.58	0.02	1,638.54
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Signal Boards	0.11	0.60	0.58	0.02	0.02	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.37	2.08	2.50	0.15	0.14	0.00	259.65	0.08	0.00	262.50
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.64	4.84	4.92	0.25	0.23	0.01	643.08	0.20	0.01	649.65
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment'.

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	10.32	67.64	83.44	3.14	2.95	0.10	9,903.26	2.40	0.08	9,987.57
Grubbing/Land Clearing	tons per phase	0.06	0.41	0.50	0.02	0.02	0.00	59.42	0.01	0.00	59.93

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles Program-estimate	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
					Emissions reflect reduction due to 25% NOx and 45% Exhaust PM reduction Mitigation Option Select									
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Cement and Mortar Mixers	0.12	0.62	0.59	0.02	0.02	0.00	101.03	0.01	0.00	101.55
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Excavators	0.73	6.88	6.47	0.22	0.20	0.01	1,089.21	0.33	0.01	1,100.33
3.00			Model Default Tier	Forklifts	0.42	2.50	2.92	0.17	0.15	0.00	312.51	0.10	0.00	315.70
2.00			Model Default Tier	Generator Sets	1.14	7.55	7.14	0.33	0.33	0.01	1,246.07	0.10	0.01	1,251.38
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Model Default Tier	Other Construction Equipmen	2.55	17.01	22.40	0.81	0.75	0.02	2,527.46	0.77	0.02	2,553.31
			Model Default Tier	Other General Industrial Equipmen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Other Material Handling Equipmer	0.50	3.95	4.23	0.15	0.14	0.01	587.25	0.18	0.01	593.25
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Signal Boards	0.11	0.60	0.58	0.02	0.02	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.37	2.03	2.50	0.15	0.14	0.00	259.85	0.08	0.00	262.50
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.64	4.84	4.92	0.25	0.23	0.01	543.09	0.20	0.01	549.65
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment — If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	6.59	48.03	51.75	2.12	1.98	0.07	6,865.10	1.78	0.06	6,926.81
Grading/Excavation	tons per phase	0.55	3.87	4.35	0.18	0.17	0.01	576.67	0.15	0.00	581.85

Emissions reflect reduction due to 20% NOx and 45% Exhaust PM reduction Mitigation Option Select

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles Program-estimate	Mitigation Option: Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Bore/Drill Rigs	0.32	2.00	3.86	0.07	0.07	0.01	897.65	0.28	0.01	906.85
2.00			Model Default Tier	Cement and Mortar Mixers	0.12	0.62	0.59	0.02	0.02	0.00	101.00	0.01	0.00	101.55
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.36	3.44	3.33	0.11	0.10	0.01	544.60	0.17	0.00	550.17
2.00			Model Default Tier	Forklifts	0.42	2.50	2.92	0.17	0.15	0.00	312.51	0.10	0.00	315.70
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00			Model Default Tier	Other Construction Equipment	2.55	17.01	22.40	0.81	0.75	0.02	2,527.45	0.77	0.02	2,553.31
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Signal Boards	0.11	0.60	0.58	0.02	0.02	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.37	2.08	2.50	0.15	0.14	0.00	250.85	0.08	0.00	262.50
4.00			Model Default Tier	Tractors/Loaders/Backhoes	1.28	9.67	9.84	0.51	0.47	0.01	1,266.18	0.30	0.01	1,280.30
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	5.54	37.90	45.73	1.85	1.70	0.06	6,027.92	1.81	0.05	6,088.51
Drainage/Utilities/Sub-Grade	tons per phase	0.03	0.23	0.27	0.01	0.01	0.00	36.17	0.01	0.00	36.53

Paving Override of Default Number of Vehicles	Default Number of Vehicles Program-estimate	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Generator Sets	1.14	7.55	7.14	0.33	0.33	0.01	1,246.07	0.10	0.01	1,251.38
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Pavers	0.73	5.72	6.50	0.22	0.20	0.01	931.42	0.29	0.01	940.93
2.00			Model Default Tier	Paving Equipment	0.57	5.11	5.19	0.18	0.16	0.01	827.02	0.25	0.01	835.47
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Rollers	0.63	4.00	4.70	0.23	0.22	0.01	543.00	0.17	0.00	548.57
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Signal Boards	0.11	0.50	0.58	0.02	0.02	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Sweepers/Scrubbers	0.37	2.08	2.50	0.15	0.14	0.00	259.85	0.08	0.00	262.50
2.00			Model Default Tier	Tractors/Loaders/Backhoes	0.64	4.84	4.82	0.25	0.23	0.01	643.36	0.20	0.01	649.65
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment'.

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Paving	pounds per day	4.18	29.83	31.53	1.38	1.30	0.05	4,549.11	1.09	0.04	4,587.64
Paving	tons per phase	0.05	0.38	0.38	0.02	0.02	0.00	54.59	0.01	0.00	55.05
Total Emissions all Phases (tons per construction period) =>		0.70	4.90	5.50	0.22	0.21	0.01	725.85	0.19	0.01	733.38

Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F4

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8

Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET