

*PUBLIC REVIEW DRAFT*  
INITIAL STUDY/  
MITIGATED NEGATIVE DECLARATION

FOR THE

WESTLEY CSD WASTEWATER  
TREATMENT FACILITIES PROJECT

Stanislaus County, CA

October 27, 2017

*Prepared for:*

Westley Community Services District  
P.O. Box 26  
Crows Landing, CA 95313  
209-892-7953

*Prepared by:*

BaseCamp Environmental  
115 S. School Street, Suite 14  
Lodi, CA 95240  
209-224-8213



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WESTLEY COMMUNITY SERVICES DISTRICT  
NOTICE OF INTENT TO ADOPT MITIGATED NEGATIVE DECLARATION  
AND NOTICE OF PUBLIC MEETING  
WESTLEY CSD WASTEWATER TREATMENT FACILITIES PROJECT

Notice is hereby given that the Westley Community Services District has prepared an Initial Study (IS) of environmental effects and intends to adopt a Mitigated Negative Declaration (MND) addressing the replacement of an existing wastewater treatment facility (WWTP) serving the community of Westley in western Stanislaus County by transporting wastewater generated in Westley to a new treatment facility located adjacent to existing treatment facilities serving the nearby community of Grayson.

The IS/MND has analyzed the potential environmental effects of the project as required by the California Environmental Quality Act (CEQA) and the CEQA Guidelines. On the basis of this analysis, the IS/MND finds that the project would not involve any significant environmental effects, provided that the mitigation measures described in the IS/MND are implemented. The Westley Community Services District has agreed to implement the mitigation measures. There are no sites enumerated under Section 65962.5 of the Government Code located on or near the project site.

Copies of the IS/MND are available for public review at the Westley Community Service District located at 254 Sperry Rd., Suite 1, Patterson from 10:00 a.m. to 3:00 p.m. Tuesday through Thursday. The IS/MND will also be available at the Stanislaus County Library reference desk located at 1500 "I" Street, Modesto and at the Patterson Public library located at 46 N Salado Ave, Patterson. The IS/MND is viewable online at <http://basecampenv.com/download-pdfs.html>. Westley Community Services District will accept public and agency comments on the IS/MND during a 30-day review period that will begin on October 27, 2017 and end on November 27, 2017. Comments may be sent via email to Ignacio Lopez at [nacho892@frontier.com](mailto:nacho892@frontier.com) or by mail to the address below.

Westley Community Services District  
P.O. Box 26  
Crows Landing, CA 95313  
Attn: Ignacio Lopez, Manager

Westley Community Services District will hold a public meeting to consider adoption of the IS/MND at the Westley Fire Station #3 located at 8595 Kern St., Westley on December 13, 2017 at 7:00 p.m.

Westley Community Services District

  
Ignacio Lopez

Date: October 27, 2017

# TABLE OF CONTENTS

	Page
NEGATIVE DECLARATION	v
A.    General Project Information	v
B.    Environmental Factors Potentially Affected	vi
C.    Lead Agency Determination	vi
Chapter 1.0    INTRODUCTION	1-1
1.1    Project Brief	1-1
1.2    Purpose of Initial Study	1-1
1.3    Project Background	1-2
1.4    Environmental Evaluation Checklist Terminology	1-4
1.5    Summary of Environmental Effects and Mitigation Measures	1-4
Chapter 2.0    PROJECT DESCRIPTION	2-1
2.1    Project Brief	2-1
2.2    Project Location	2-1
2.3    Project Objectives	2-1
2.4    Project Details	2-2
2.5    Permits and Approvals	2-3
Chapter 3.0    ENVIRONMENTAL EVALUATION FORM	3-1
3.1    Aesthetics	3-1
3.2    Agriculture and Forestry Resources	3-2
3.3    Air Quality	3-4
3.4    Biological Resources	3-8
3.5    Cultural Resources	3-15
3.6    Geology and Soils	3-18
3.7    Greenhouse Gas Emissions	3-22
3.8    Hazards and Hazardous Materials	3-24
3.9    Hydrology and Water Quality	3-27
3.10    Land Use and Planning	3-30
3.11    Mineral Resources	3-32
3.12    Noise	3-32
3.13    Population and Housing	3-35
3.14    Public Services	3-36
3.15    Recreation	3-37
3.16    Transportation/Traffic	3-38

3.17	Tribal Cultural Resources	3-40
3.18	Utilities and Service Systems	3-42
3.19	Mandatory Findings of Significance	3-44
Chapter 4.0	LIST OF PREPARERS, SOURCES	4-1
4.1	Document Preparers	4-1
4.2	Documents Cited	4-1
4.3	Internet Sources Cited	4-3
4.4	Persons Consulted	4-4
Chapter 5.0	NOTES RELATED TO EVALUATION OF ENVIRONMENTAL IMPACTS	5-1

#### APPENDICES

- A. Air Quality
- B. Biological Resources
- C. Cultural Resources

#### LIST OF TABLES

1-1	Summary of Environmental Impacts and Mitigation Measures	1-11
3-1	Air Basin Attainment Status with Federal and State Ambient Air Quality Standards	3-5
3-2	Estimated Air Pollutant Emissions from Force Main Construction	3-7

#### LIST OF FIGURES

1-1	Regional Map	1-5
1-2	Aerial Photos	1-6
1-3	Assessor Parcel Map	1-7
1-4	USGS Map	1-8
1-5	Westley WWTP Service Area	1-9
1-6	Westley Existing Wastewater Facilities	1-10
2-1	Proposed Force Main Alignment	2-4
2-2	Proposed Grayson WWTP Site Improvements	2-5

## LIST OF ACRONYMS AND ABBREVIATIONS USED IN THIS DOCUMENT

AB	Assembly Bill
ARB	California Air Resources Board
Caltrans	California Department of Transportation
CDFW	California Department Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CSD	Community Services District
dB	decibel
dBA	A-weighted decibels
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act (federal)
FEMA	Federal Emergency Management Agency
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GHG	greenhouse gas
gpd	gallons per day
HACS	Housing Authority of the County of Stanislaus
IS/MND	Initial Study/Mitigated Negative Declaration
L <sub>eq</sub>	equivalent continuous sound level
L <sub>max</sub>	maximum noise level
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
NO <sub>x</sub>	nitrogen oxides
PM <sub>10</sub>	particulate matter 10 microns or less in diameter
PM <sub>2.5</sub>	particulate matter 2.5 microns or less in diameter
RCEM	Road Construction Emissions Model
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SJVAPCD	San Joaquin Valley Air Pollution Control District
SR	State Route
SRF	State Revolving Fund
StanCOG	Stanislaus Council of Governments
StaRT	Stanislaus Regional Transit
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board

TAC	toxic air contaminant
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WDR	Waste Discharge Requirement
WSID	West Stanislaus Irrigation District
WWTP	Wastewater Treatment Plant

# NEGATIVE DECLARATION

## A. General Project Information

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Project Title:	Westley CSD Wastewater Treatment Facilities Project
Lead Agency Name and Address:	Westley Community Services District P.O. Box 26 Crows Landing, CA 95313
Contact Person and Phone Number:	Ignacio Lopez, Manager 209-892-7953
Project Location:	Between the unincorporated communities of Westley and Grayson in western Stanislaus County, California. The project area is shown on the USGS Westley, California, 7.5-minute quadrangle map as located within the El Pescadero land grant in Township 4 South, Range 7 East.
Project Sponsor Name and Address:	Housing Authority of the County of Stanislaus P.O. Box 581918 Modesto, CA 95358
General Plan Designation:	Various, mainly agricultural
Zoning:	Various, mainly agricultural
Description of Project:	The project is the installation of a sanitary sewer pipeline from the existing Westley Wastewater Treatment Plant (WWTP) to the site of the existing Grayson WWTP. The total length of the proposed pipeline would be approximately 3.25 miles. Improvements would be added to the existing Grayson WWTP facility, including aeration and stabilization ponds where the combined wastewaters would be treated and discharged to an existing disposal area. The existing Westley WWTP would be decommissioned and abandoned.
Surrounding Land Uses and Setting:	The western end of the project is located in the community of Westley, which has residential, commercial and school land uses. Beyond Westley, the proposed pipeline would go through agricultural land before ending at the Grayson WWTP site.
Other Public Agencies Whose Approval is Required:	SWRCB (State Revolving Fund application and Waste Discharge Requirements), California Department of Transportation (encroachment permit)



## B. Environmental Factors Potentially Affected

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The environmental factors checked below may be significantly affected by this project, involving at least one impact that is a “Potentially Significant Impact” prior to mitigation. Mitigation measures that would avoid potential effects or reduce them to a less than significant level have been prescribed for each of these effects, as described in the checklist and narrative on the following pages, and in the Summary at the end of Chapter 1.0.

	Aesthetics		Agriculture/Forestry Resources		Air Quality
√	Biological Resources	√	Cultural Resources	√	Geology/Soils
	Greenhouse Gas Emissions	√	Hazards/Hazardous Materials		Hydrology/Water Quality
	Land Use/Planning		Mineral Resources		Noise
	Population/Housing		Public Services		Recreation
√	Transportation/Traffic		Tribal Cultural Resources		Utilities/Service Systems
√	Mandatory Findings of Significance				

## C. Lead Agency Determination

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On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- √ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project and/or mitigation measures that would reduce potential effects to a less than significant level have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared. All applicable mitigation measures are shown in the Summary Table (Table 1-1) at the end of Chapter 1.0.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

- I find that, although the proposed project could have a significant effect on the environment, nothing further is required because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project.

WESTLEY COMMUNITY SERVICES DISTRICT

  
\_\_\_\_\_  
Ignacio Lopez, Manager

10-27-2017  
Date

# 1.0 INTRODUCTION

## 1.1 Project Brief

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This document is an Initial Study/Mitigated Negative Declaration (IS/MND) for the Westley-Grayson Sewer Line Project (project). The project site is located between the unincorporated communities of Westley and Grayson in western Stanislaus County, California (Figures 1-1 through 1-4). The IS/MND has been prepared in compliance with the requirements of the California Environmental Quality Act (CEQA). The Housing Authority for the County of Stanislaus (HACS) is the project proponent, and the Westley Community Services District (CSD) is the CEQA Lead Agency for the project.

The project proposes to install a sanitary sewer main from the existing Westley Wastewater Treatment Plant (WWTP) to the existing Grayson WWTP approximately 2.5 miles to the northeast. The total length of the proposed pipeline would be approximately 17,200 linear feet (3.25 miles). Improvements would be made at the existing Grayson WWTP site, including aeration and stabilization ponds for treatment. After treatment, the combined wastewaters would be discharged to a land disposal area. A new influent pump station would be constructed in the HACS facility to send collected wastewater to the force main. The existing Westley WWTP would be decommissioned and abandoned.

## 1.2 Purpose of Initial Study

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CEQA requires that public agencies document and consider the potential environmental effects of the agency's actions that meet CEQA's definition of a "project." Briefly summarized, a "project" is an action that has the potential to result in direct or indirect physical changes in the environment. A project includes the agency's direct activities as well as activities that involve public agency approvals or funding. Guidelines for an agency's implementation of CEQA are found in the "CEQA Guidelines" (Title 14, Chapter 3 of the California Code of Regulations).

Provided that a project is not exempt from CEQA, the first step in the agency's consideration of its potential environmental effects is the preparation of an Initial Study. The purpose of an Initial Study is to determine whether the project would involve "significant" environmental effects as defined by CEQA and to describe feasible mitigation measures that would avoid significant effects or reduce them to a less than significant level. In the event that the Initial Study does not identify significant effects, or identifies mitigation measures that would reduce all of the significant effects of the project to a less than significant level, the agency prepares a Negative Declaration. If this is not the case – that is, if the project would involve significant effects that cannot be readily mitigated - the agency must prepare an Environmental Impact Report (EIR). The agency may also decide to proceed directly with the preparation of an EIR without preparation of an Initial Study.

The proposed project is a "project" as defined by CEQA and is not exempt from CEQA consideration. The Westley CSD determined that the project involves the potential for significant environmental effects and required preparation of this Initial Study. The Initial Study describes the proposed project and describes its environmental setting; it discusses the potential environmental effects of the project and identifies feasible mitigation measures that would reduce

the potentially significant environmental effects of the project to a less than significant level. The Initial Study considers the project's potential for significant environmental effects in the following subject areas:

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gases
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation/Traffic
- Tribal Cultural Resources
- Utilities and Service Systems
- Mandatory Findings of Significance

The Initial Study concludes that the project would have significant environmental effects, but that all of these effects would be reduced to a less than significant level with recommended mitigation measures. As a result, the Westley CSD has prepared a Mitigated Negative Declaration and notified the public of the District's intent to adopt the IS/MND. As of the distribution of the IS/MND for public review, the applicant has accepted all of the recommended mitigation measures. The time available for comment on the IS/MND is shown in the Notice of Intent.

### 1.3 Project Background

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The community of Westley is an unincorporated community in western Stanislaus County, located at the intersection of State Route (SR) 33 and Grayson Road. The Union Pacific Railroad (UPRR) operates a track at the eastern edge of Westley. Westley consists primarily of single-family residences. A commercial area is located on the west side of SR 33 from Howard Road to E Street. Between SR 33 and the railroad track are agricultural warehouses and packing sheds. The Grayson Charter School is located in the western portion of Westley.

The HACS is a nonprofit, public corporation formed to address the unmet housing needs of residents and communities in Stanislaus County. It is governed by a citizen's commission appointed by the County Board of Supervisors. Programs that are administered by the HACS include housing choice vouchers (Section 8), public housing, affordable housing, and migrant and farm labor housing. The HACS operates the Westley Farm Labor Housing Complex in the western portion of Westley. The Farm Labor Housing Complex consists of 86 migrant units (occupied May through October), 85 farm labor units (occupied year-round), and 20 public housing units (occupied year-round) as well as an office, laundry building, community center, maintenance shop, and daycare (HACS 2017).

The Westley CSD provides sewer collection service to an estimated population of 600 (Figure 1-5). The sewer system currently consists of 23 residential connections, 15 commercial connections, and one school connection. Wastewater generated by the Westley CSD service area is collected and conveyed by gravity to a sewer pump station (Pump Station #1) owned and operated by Westley CSD (Figure 1-6). From this pump station, the wastewater is pumped to another sewer pump station (Pump Station #2), which is owned by the HACS and collects wastewater from the Westley Farm Labor Housing Complex. The wastewater is then further conveyed to the existing Westley WWTP.

The Westley CSD and HACS jointly constructed the WWTP in the early 1970s. The WWTP improvements were funded and are owned by Westley CSD, while the HACS operates the WWTP and owns the property. The WWTP facilities consist of an aeration pond, an oxidation pond, and percolation ponds (see Figure 1-6). The WWTP provides primary wastewater treatment, which consists of temporarily holding wastewater in a pond where heavy solids can settle to the bottom while oil, grease and lighter solids float to the surface. The settled and floating materials are removed and the remaining liquid is sent to aeration and oxidation ponds for secondary treatment before finally being discharged to disposal beds, where the treated effluent percolates into the ground. The Westley WWTP is regulated under Waste Discharge Requirements (WDRs) specified in Order No. R5-93-087, issued by the Regional Water Quality Control Board (RWQCB), Central Valley Region. The average dry weather flow in 2014 was 24,283 gallons per day (gpd). The current permitted design flow for the Westley WWTP is 110,000 gpd.

The existing Westley WWTP is outdated and provides only primary treatment. Aeration currently does not occur at the WWTP, as the aerator is in need of repair. Much of the equipment at the WWTP is in poor condition and has been determined to be beyond their useful life. Effluent pipes are cracked, and valving no longer allows flows to several disposal beds. In 2007, the Westley CSD and the HACS received a Notice of Violation of the WDRs from the RWQCB, which required the agencies to address weed growth around the oxidation ponds and in four disposal beds. The Notice also required a plan for sludge removal from the oxidation and aeration ponds, and it noted that the monitoring program for groundwater quality at the WWTP does not meet current RWQCB standards. A second Notice of Violation was issued in 2014 for the same violations (Black Water 2016).

## Selection of Proposed Project

Black Water Consulting engineers completed a Plan of Study in 2014 for the Westley CSD to determine the improvements necessary to bring the wastewater facilities in to compliance with RWQCB. An evaluation of the Westley WWTP facilities was conducted to develop options for improving efficiency of operations and wastewater treatment methods, disposing of effluent for groundwater protection, and complying with RWQCB regulations. From this evaluation, five alternatives were developed, along with a “no project” alternative:

- Improve existing Westley WWTP pond system.
- Extended aeration package plant at existing Westley WWTP site.
- New pond treatment at Grayson WWTP site.
- New extended aeration package plant at Grayson WWTP site.
- Regionalization using existing pond treatment at Grayson WWTP site.

After further evaluation, the fifth alternative listed above, “regionalization”, was selected as the preferred alternative. This alternative is the proposed project analyzed in this IS/MND. Among five factors for which each alternative were evaluated, the selected alternative received the highest overall score and was ranked the highest in terms of operations and maintenance, reliability, and benefits to the community (Black Water 2016).

The Grayson WWTP, located approximately 1 mile northeast of the community of Grayson, is operated by the Grayson CSD. The Grayson CSD provides sewer and street lighting services to the community of Grayson. The Grayson WWTP currently has a permitted design flow of 100,000 gpd. It provides secondary treatment of wastewater, which generally consists of the removal of organic matter, typically by biological processes, not otherwise removed by primary treatment.

## 1.4 Environmental Evaluation Checklist Terminology

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The project’s potential environmental effects are evaluated in the Environmental Evaluation Checklist shown in Chapter 3.0. The checklist includes a list of environmental considerations against which the project is evaluated. For each question, the City determines whether the project would involve: 1) No Impact, 2) a Less Than Significant Impact, 3) a Less Than Significant Impact With Mitigation Incorporated, or 4) a Potentially Significant Impact.

A Potentially Significant Impact occurs when there is substantial evidence that the project would involve a substantial adverse change to the physical environment, i.e., that the environmental effect may be significant, and mitigation measures have not been defined that would reduce the impact to a less than significant level. If there are one or more Potentially Significant Impact entries in the Initial Study, an EIR is required.

A Less Than Significant Impact occurs when the project would involve effects on a particular resource, but the project would not involve a substantial adverse change to the physical environment, and no mitigation measures are required.

An environmental effect that is Less Than Significant With Mitigation Incorporated is a Potentially Significant Impact that can be avoided or reduced to a less than significant level with the application of mitigation measures.

A determination of No Impact is self-explanatory.

This IS/MND prescribes mitigation measures for the potentially significant environmental effects of the project. Mitigation measures that are not already established in law and practice are identified in this document.

## 1.5 Summary of Environmental Effects and Mitigation Measures

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The following pages contain Table 1-1, Summary of Impacts and Mitigation Measures. The table summarizes the results of the Environmental Checklist Form and associated narrative discussion shown in Chapter 3.0.

The potential environmental impacts of the proposed project are summarized in the left-most column of this table. The level of significance of each impact is indicated in the second column. Mitigation measures proposed to minimize the impacts are shown in the third column, and the significance of the impact, after mitigation measures are applied, is shown in the fourth column.





WESTLEY WWTTP

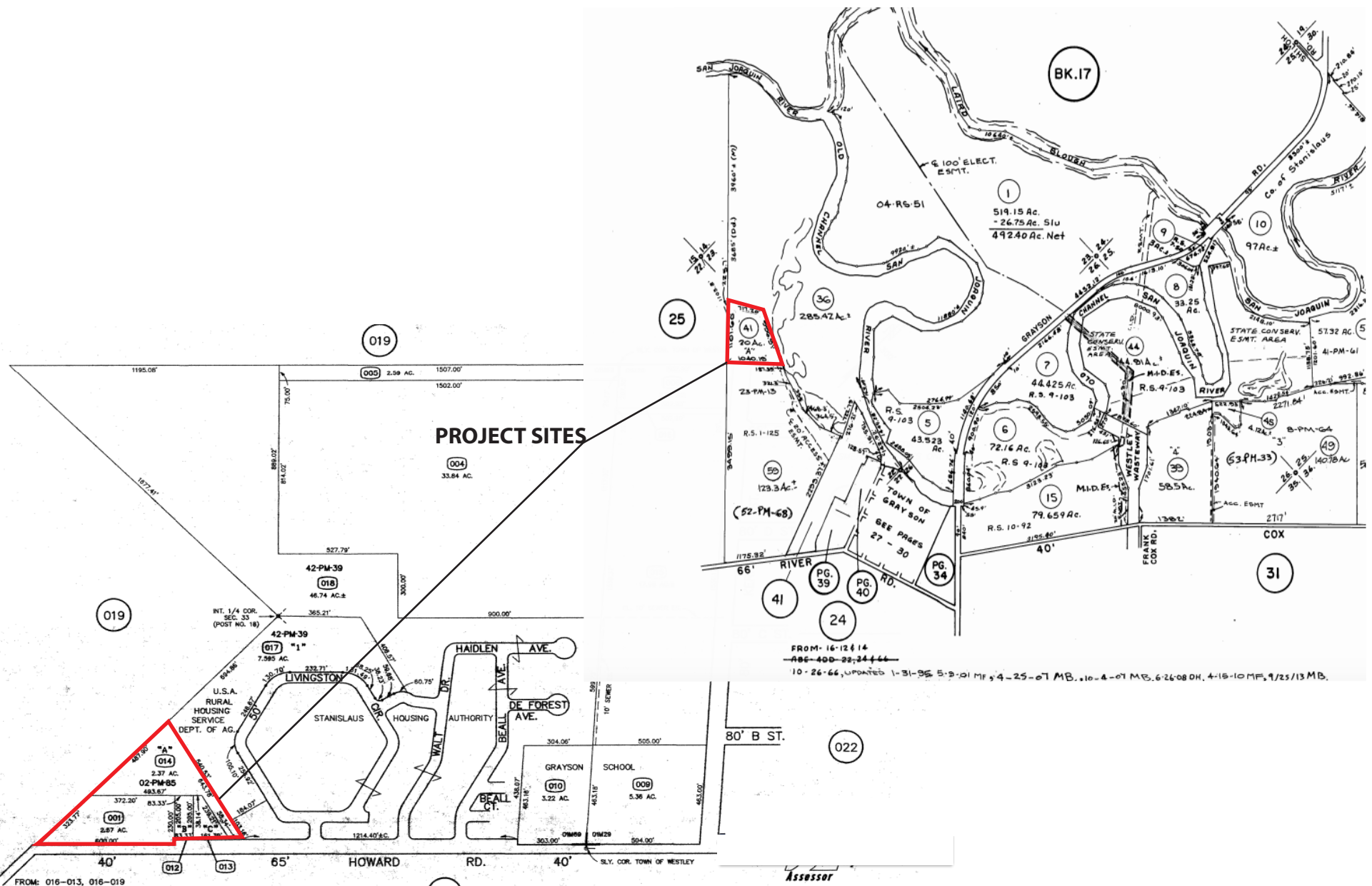


GRAYSON WWTTP



PROJECT LOCATIONS





SOURCE: Stanislaus County Assessor's Office, Book 017 Page 20 and 26.

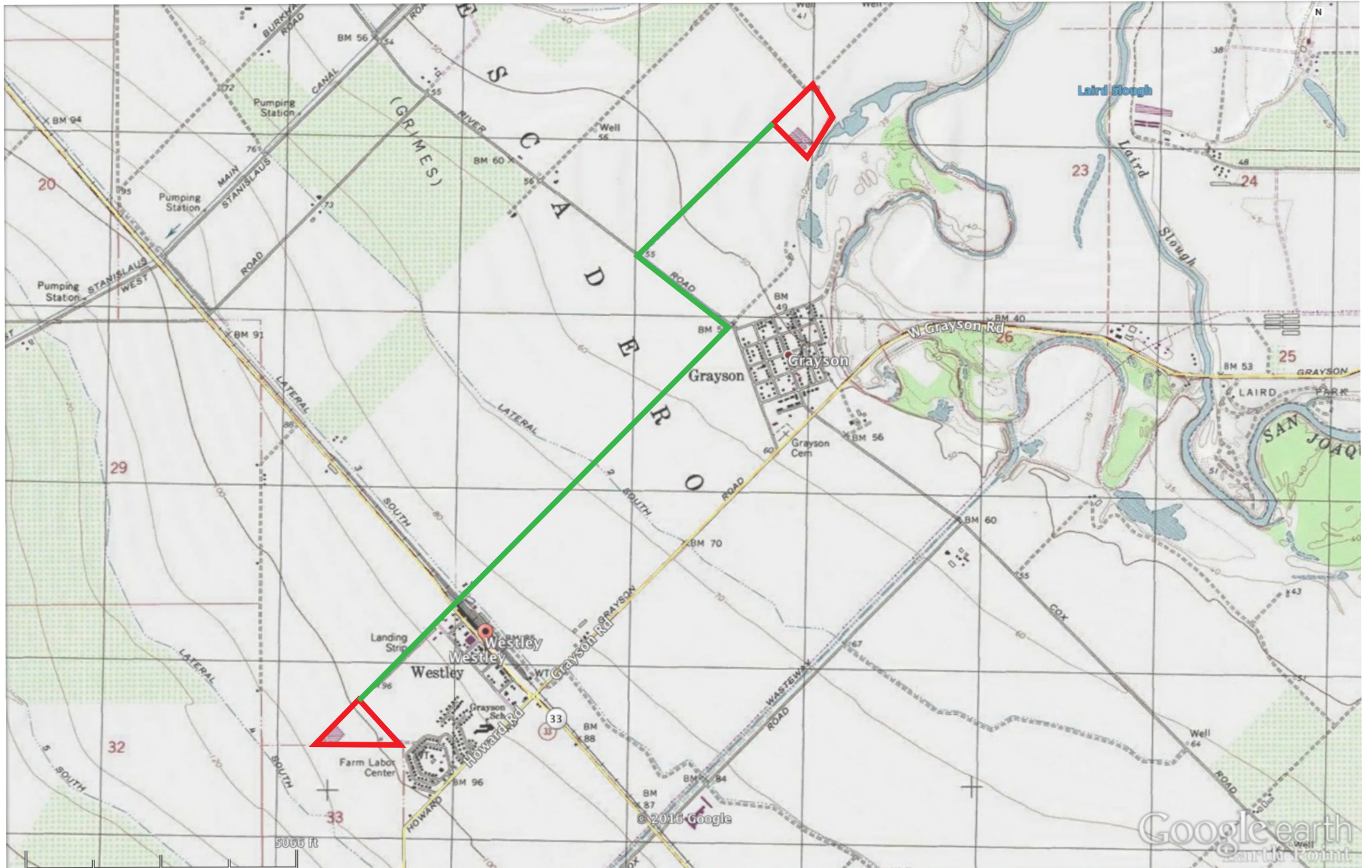
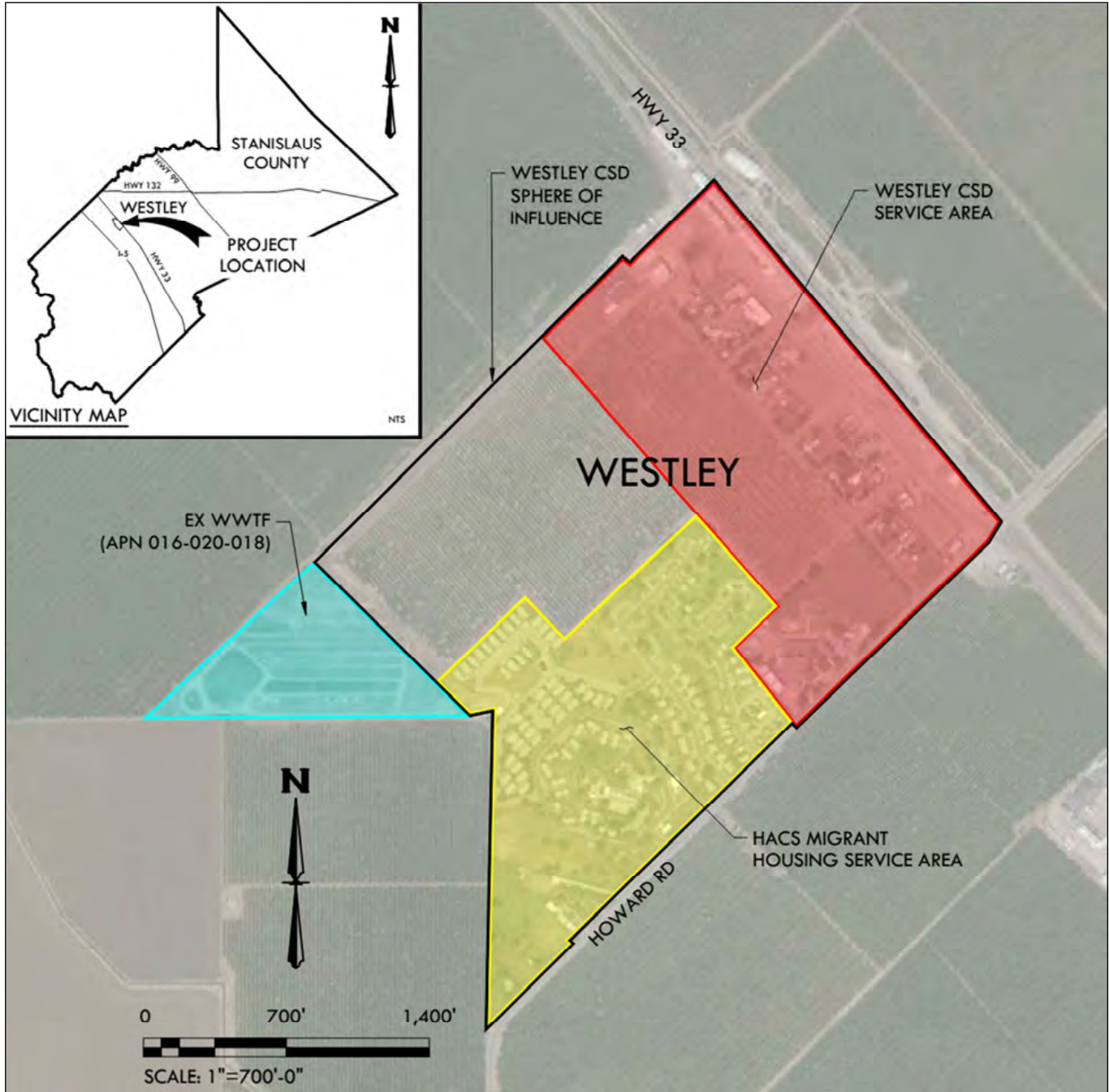
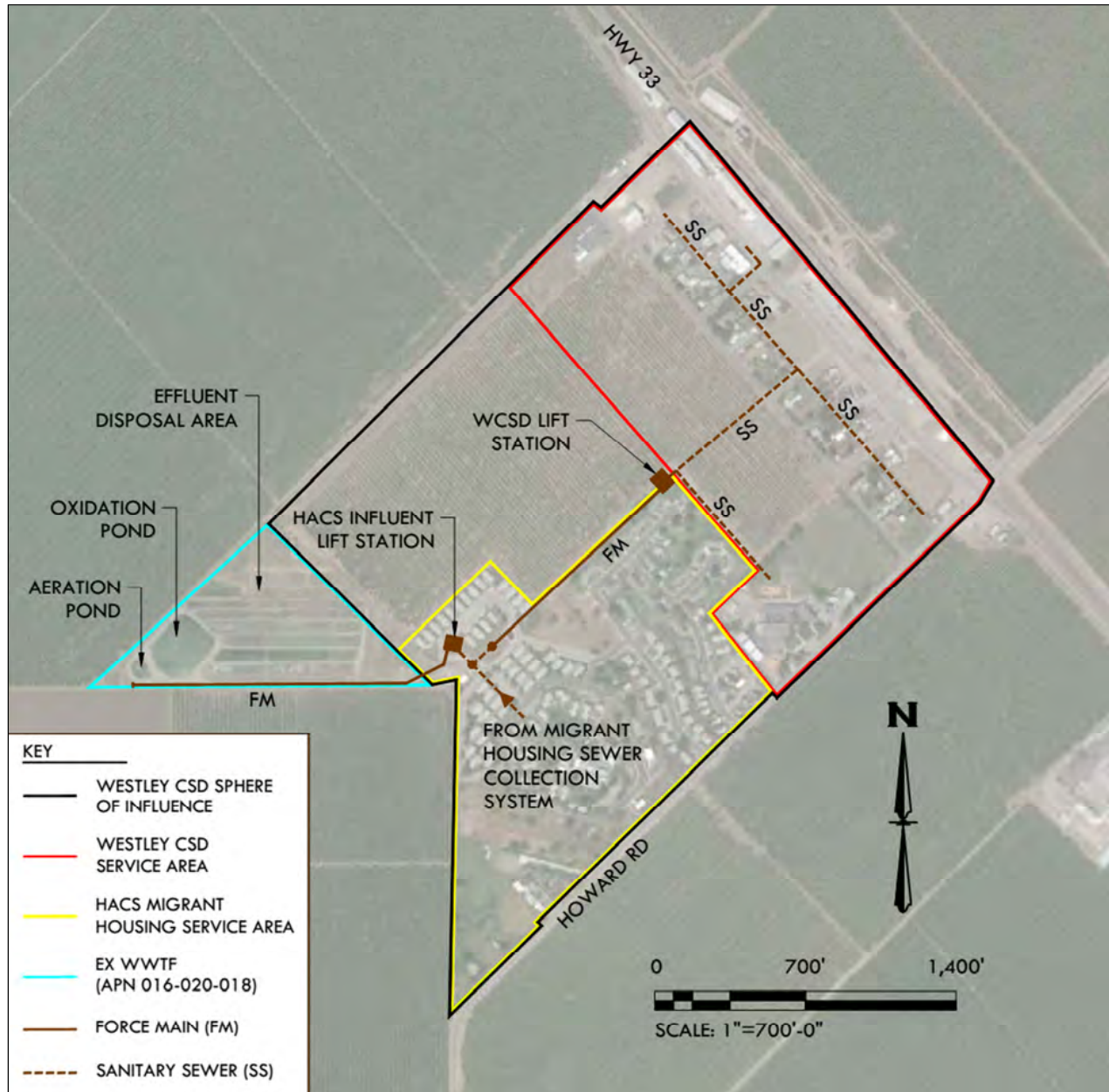


Figure 2-1 – Vicinity and Service Area Map



Wastewater generated by the WCSD and HACS SAs is conveyed and treated at the Westley WWTF. The existing WWTF is located southwest of the WCSD SA boundary, on parcel 016-020-018 and encompasses approximately 16.3 acres. Figure 2-2 presents an overview of the existing collection and treatment facilities for the Westley WWTF service area.

**Figure 2-2 – Existing Collection and Treatment Facilities**



## 2.2 Current Land Use and Land Use Trends

The WCSO SA and SOI land uses consist of residential, commercial, industrial and agricultural. Residential areas consist of single family and multifamily land use. Commercial land use consists of retail and restaurants. Industrial land uses include distribution warehouse facilities. Land use data for the WCSO SA and SOI was obtained from the Stanislaus County General Plan (GP) and Stanislaus County Parcel Maps. The GP, revised in 1994, defines 16 primary land use designations for the major categories

TABLE 1-1  
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Significance Before Mitigation Measures	Mitigation Measures	Significance After Mitigation Measures
<b>3.1 AESTHETICS</b>			
a) Scenic Vistas	NI	None required	-
b) Scenic Routes and Resources	NI	None required	-
c) Visual Character and Quality	LS	None required	-
d) Light and Glare	NI	None required	-
<b>3.2 AGRICULTURE AND FORESTRY RESOURCES</b>			
a) Agricultural Land Conversion	NI	None required	-
b) Agricultural Zoning and Williamson Act	NI	None required	-
c, d) Forest Land Conversion and Zoning	NI	None required	-
e) Indirect Conversion of Farmland and Forest Land	NI	None required	-
<b>3.3 AIR QUALITY</b>			
a) Air Quality Plan Consistency	NI	None required	-
b) Violation of Air Quality Standards	LS	None required	-
c) Cumulative Emissions	NI	None required	-
d) Exposure of Sensitive Receptors	LS	None required	-
e) Odors	LS	None required	-

TABLE 1-1  
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Significance Before Mitigation Measures	Mitigation Measures	Significance After Mitigation Measures
<b>3.4 BIOLOGICAL RESOURCES</b>			
a) Special-Status Species	PS	<p>BIO-1: If construction commences between March 1 and September 15, then pre-construction surveys for nesting Swainson’s hawks shall be conducted within 0.5 miles of the project construction area. If active nests are found, then a qualified biologist shall determine the need for any temporal restrictions on construction. The determination shall be made pursuant to criteria set forth by CDFW in its 1994 Staff Report Regarding Mitigation for Impacts to Swainson’s Hawk (<i>Buteo swainsoni</i>) in the Central Valley of California. No further mitigation shall be implemented if no active Swainson’s hawk nests are found, and no mitigation need be implemented if construction activities occur outside the nesting season.</p> <p>BIO-2: If construction commences between February 1 and August 31, then pre-construction surveys for burrowing owls shall be conducted within 250 feet of the project construction area. If occupied burrows are found, a qualified biologist should determine the need for any temporal restrictions on construction. The determination shall be made pursuant to criteria set forth by CDFW in its 2012 Staff Report on Burrowing Owl Mitigation. No further mitigation shall be implemented if no active burrows are found, and no mitigation need be implemented if construction activities occur outside the nesting season.</p>	LS
b) Riparian and Other Sensitive Habitats	LS	None required	-
c) Wetlands	LS	None required	-

TABLE 1-1  
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Significance Before Mitigation Measures	Mitigation Measures	Significance After Mitigation Measures
d) Fish and Wildlife Movement	PS	BIO-3: If construction commences during the general avian nesting season (March 1 through July 31), then pre-construction surveys for nesting birds shall be conducted within 0.25 miles of the project construction area. If active nests are found, then work in the vicinity of the nest shall be delayed until the young have fledged. No further mitigation shall be implemented if no active bird nests are found, and no mitigation need be implemented if construction activities occur outside the general avian nesting season.	LS
e) Local Biological Requirements	NI	None required	-
f) Conflict with Habitat Conservation Plans	NI	None required	-
<b>3.5 CULTURAL RESOURCES</b>			
a) Historical Resources	LS	None required	-
b) Archaeological Resources	PS	CULT-1: If any subsurface cultural or paleontological resources are encountered during construction of the project, all construction activities in the vicinity of the encounter shall be halted until a qualified archaeologist, or paleontologist as appropriate, can examine these materials, make a determination of their significance and, if significant, recommend further mitigation measures that would reduce potential effects to a less than significant; such measures could include 1) preservation in place or 2) excavation, recovery and curation by qualified professionals. The Community Services District shall be responsible for retaining qualified professionals, implementing recommended mitigation measures and	LS

TABLE 1-1  
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Significance Before Mitigation Measures	Mitigation Measures	Significance After Mitigation Measures
		documenting mitigation efforts in a written report, consistent with the requirements of the CEQA Guidelines.	
c) Paleontological Resources and Unique Geologic Features	PS	Mitigation Measure CULT-1.	LS
d) Human Burials	LS	None required	-
<b>3.6 GEOLOGY AND SOILS</b>			
a-1) Fault Rupture Hazards	NI	None required	-
a-2) Seismic Ground Shaking	LS	None required	-
a-3) Other Seismic Hazards	PS	GEO-1: A site-specific, design-level geotechnical study shall be completed for the project site before a grading permit is issued. The study shall include an evaluation of liquefaction potential in the construction area and identify appropriate means to minimize or avoid damage from liquefaction. In addition, the study shall identify the presence of expansive soils in the construction area and recommend design and construction features to reduce the potential impact of these soils on project facilities. Geotechnical design recommendations included in the study shall be implemented during project design and construction.	LS
a-4) Landslides	NI	None required	-
b) Soil Erosion	LS	None required	-
c) Geologic Instability	NI	None required	-
d) Expansive Soils	PS	Mitigation Measure GEO-1.	LS



TABLE 1-1  
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Significance Before Mitigation Measures	Mitigation Measures	Significance After Mitigation Measures
e) Adequacy of Soils for Wastewater Disposal	NI	None required	-
<b>3.7 GREENHOUSE GAS EMISSIONS</b>			
a) Project GHG Emissions	LS	None required	-
b) Consistency with GHG Reduction Plans	LS	None required	-
<b>3.8 HAZARDS AND HAZARDOUS MATERIALS</b>			
a) Hazardous Material Transport, Use and Storage	NI	None required	-
b, c) Release of Hazardous Materials	LS	None required	-
c) Hazardous Material Releases near Schools	NI	None required	-
d) Hazardous Materials Sites	LS	None required	-
e) Airport Operations	NI	None required	-
f) Airstrip Operations	LS	None required	-
g) Emergency Response and Evacuation	PS	HAZ-1: If open trenching will be used for installation of the force main at any road crossing, the contractor shall develop and implement a Traffic Control Plan prior to the start of trenching. The Traffic Control Plan shall include such items as traffic control requirements, resident notification of access closure, and daily access restoration. The contractor shall specify dates and times of road closures or restrictions, if any, and shall ensure that adequate access will be provided for emergency vehicles. The Traffic Control Plan shall be coordinated with the Stanislaus County Sheriff's Department and the West	LS

TABLE 1-1  
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Significance Before Mitigation Measures	Mitigation Measures	Significance After Mitigation Measures
		Stanislaus County Fire Protection District if construction will require road closures or lane restrictions.	
h) Wildland Fire Hazards	NI	None required	-
<b>3.9 HYDROLOGY AND WATER QUALITY</b>			
a, f) Surface Water Quality	LS	None required	-
b) Groundwater Supplies	NI	None required	-
c, d) Drainage Patterns	LS	None required	-
e) Runoff	NI	None required	-
g) Housing within Flood Hazard Area	NI	None required	-
h) Alteration of Flood Flows	LS	None required	-
i) Dam and Levee Failure Hazards	LS	None required	-
j) Seiche, Tsunami and Mudflow Hazards	NI	None required	-
<b>3.10 LAND USE AND PLANNING</b>			
a) Division of Established Communities	NI	None required	-
b) Conflict with Applicable Plans, Policies and Regulations	LS	None required	-
c) Conflict with Habitat Conservation Plans	NI	None required	-
<b>3.11 MINERAL RESOURCES</b>			
a, b) Loss of Mineral Resource Availability	NI	None required	-

TABLE 1-1  
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Significance Before Mitigation Measures	Mitigation Measures	Significance After Mitigation Measures
<b>3.12 NOISE</b>			
a) Exposure to Noise Exceeding Local Standards	LS	None required	-
b) Groundborne Vibrations	LS	None required	-
c) Permanent Increase in Ambient Noise	NI	None required	-
d) Temporary or Periodic Increase in Ambient Noise	LS	None required	-
e, f) Exposure to Airport/Airstrip Noise	NI	None required	-
<b>3.13 POPULATION AND HOUSING</b>			
a) Population Growth Inducement	LS	None required	-
b, c) Displacement of Housing and People	NI	None required	-
<b>3.14 PUBLIC SERVICES</b>			
a) Fire Protection	NI	None required	-
b) Police Protection	NI	None required	-
c) Schools	NI	None required	-
d, e) Parks and Other Public Facilities	NI	None required	-
<b>3.15 RECREATION</b>			
a, b) Recreational Facilities	NI	None required	-

TABLE 1-1  
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Significance Before Mitigation Measures	Mitigation Measures	Significance After Mitigation Measures
<b>3.16 TRANSPORTATION/TRAFFIC</b>			
a) Conflict with Transportation Plans, Ordinances and Policies	NI	None required	-
b) Conflict With Congestion Management Program	NI	None required	-
c) Air Traffic Patterns	NI	None required	-
d) Traffic Hazards	NI	None required	-
e) Emergency Access	PS	Mitigation Measure HAZ-1.	LS
f) Conflict with Non-vehicular Transportation Plans	NI	None required	-
<b>3.17 TRIBAL CULTURAL RESOURCES</b>			
a, b) Tribal Cultural Resources	LS	None required	-
<b>3.18 UTILITIES AND SERVICE SYSTEMS</b>			
a, b, e) Wastewater Systems	LS	None required	-
b, d) Water Systems and Supply	NI	None required	-
c) Stormwater Systems	NI	None required	-
f, g) Solid Waste Services	NI	None required	-
<b>3.19 MANDATORY FINDINGS OF SIGNIFICANCE</b>			
a) Findings on Biological and Cultural Resources	PS	Mitigation measures in Sections 3.4 and 3.5 above.	LS

TABLE 1-1  
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential Impact	Significance Before Mitigation Measures	Mitigation Measures	Significance After Mitigation Measures
b) Findings on Individually Limited but Cumulatively Considerable Impacts	LS	None required	-
c) Findings on Adverse Effects on Human Beings	NI	None required	-

## 2.0 PROJECT DESCRIPTION

### 2.1 Project Brief

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The project proposes replacement of an existing wastewater treatment facility (WWTP) serving the community of Westley in western Stanislaus County by transporting wastewater generated in Westley to a new Westley treatment facility located adjacent to existing treatment facilities serving the nearby community of Grayson. The existing Westley WWTP is outdated and provides only primary treatment of wastewater. In response to a 2007 Notice of Violation from the Central Valley Regional Water Quality Control Board (RWQCB), an engineering study of alternatives for providing adequate wastewater treatment recommended the proposed project.

Recommended from among six alternatives, as described in Section 1.3, Project Background, the proposed project would divert wastewater generated in Westley to a new wastewater pump station and force main approximately 3.25 miles in length east from the existing Westley WWTP through the community of Westley to a combined Westley/Grayson WWTP on the Grayson WWTP site (“the Grayson property”). Improvements to the existing Grayson WWTP would include a new headworks, aeration and stabilization ponds, and a disposal field for wastewater treated to secondary standards. On completion of the project, the existing Westley WWTP would be decommissioned and abandoned.

### 2.2 Project Location

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The project area is generally located within and between the unincorporated communities of Westley and Grayson in western Stanislaus County, California (see Figures 1-1 through 1-5). The western terminus is the existing Westley WWTP site, and the eastern terminus is the Grayson property, northeast of the community of Grayson. The project area is shown on the U.S. Geological Survey Westley, California, 7.5-minute quadrangle map as located within the El Pescadero land grant in Township 4 South, Range 7 East, Mt. Diablo Base and Meridian.

The project site includes the entire Westley WWTP site and the Grayson property and the pipeline alignment connecting the two sites. The pipeline alignment and alignment alternatives are shown on Figure 2-1. Between the Westley WWTP and the community of Westley, the alignment consists of existing unimproved farm access roads. Within Westley, the alternative alignments are located within paved and unpaved public street rights-of-way, the SR 33 right-of-way, and the UPRR right-of-way. East of the railroad, the alignment follows farm roads, River Road and an existing unpaved public road that provides farm access as well as access to the Grayson property.

### 2.3 Project Objectives

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The objectives of the project are as follows:

- To provide wastewater treatment facilities that will meet existing and anticipated future needs of the community of Westley and the HACS Westley Farm Labor Housing Complex.

- To improve process and performance in the collection and treatment of wastewater generated in the Westley area.
- To comply with applicable wastewater treatment regulatory requirements.
- To remove from HACS the responsibility of maintaining and operating a WWTP so it can focus more on its core mission of providing affordable housing.
- To provide a benefit to a predominantly low-income and minority community in Westley.

## 2.4 Project Details

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The proposed project would construct a new wastewater pump station, a force main, and improvements to the existing Grayson wastewater treatment facilities that would replace the existing Westley WWTP presently located adjacent to the existing Farm Labor Housing Complex. The combined wastewater facilities would be located at the existing Grayson WWTP north of the community of Grayson. It would include new headworks and screens, and a series of aeration and stabilization ponds which would discharge the combined wastewaters to the existing Grayson disposal area. Wastewater would be treated to secondary standards subject to WDRs issued by the Central Valley RWQCB.

Wastewater from HACS housing and the Westley community is presently collected to the southeast corner of the existing Westley WWTP, where it is pumped to the existing headworks at the western corner of the WWTP. The project would install a new influent lift station of an estimated 15 horsepower at this location, which would direct the collected wastewater into a proposed force main. A standby generator would be installed at the new lift station. Upon completion of the project, the remaining Westley WWTP facilities would be decommissioned and abandoned, including the disposal beds.

An approximately 3.25-mile (17,200 feet) force main would be installed that would connect the existing Westley WWTP site to the new facilities at the Grayson site (see Figure 2-1). Beginning from the new pump station, the main would follow a northwesterly course along an existing access road at the edge of the Westley WWTP to its northern corner, then northeasterly along farm roads, including existing industrial access roads in the community of Westley, to and across SR 33 and the UPRR. Alternatively, the main could be located on other alignments through the community of Westley, but would ultimately be located east of the UPRR tracks.

Once outside of Westley, the force main would continue northeasterly along existing farm roads to River Road, a paved County road in Grayson. This segment of the force main would cross two West Stanislaus Irrigation District (WSID) canals – Lateral 2 South and Lateral 3 South. At River Road, the force main would turn north and parallel River Road to the entrance to an unpaved public road providing access to the Grayson WWTP property. The force main would turn east and follow that road to the Grayson WWTP site. For most of its length, the force main would be placed in an open trench to a depth of approximately 3-5 feet, with a minimum of 18 inches of cover material made up primarily of native material. The force main crossing would be directionally drilled (i.e., “bore and jack”) beneath SR 33 and the UPRR, while the crossings at the WSID canals either would be directionally drilled or would use open trench.

The wastewater in the force main would be discharged into new facilities that would be constructed on the Grayson WWTP site (Figure 2-2). The design capacity for the new facilities would be specified in new WDRs to be issued by the Central Valley RWQCB, but it is

anticipated that it would be similar to the permitted design flow for the existing Westley WWTP, which is 110,000 gpd. The new facilities would consist of a headworks that would send the influent to a series of aeration and stabilization ponds sized for the design flow, with redundant ponds and bypass piping to allow for rotation and bypass of treatment ponds. Wastewater in the ponds would be aerated using floating aerators. After aeration, the treated effluent will be discharged to an adjacent existing disposal area. No additional disinfection of wastewater would occur. Sludge that is left in the ponds and disposal area would be removed through contracted maintenance as needed. Groundwater monitoring wells would be installed around the new facility to check on water quality impacts.

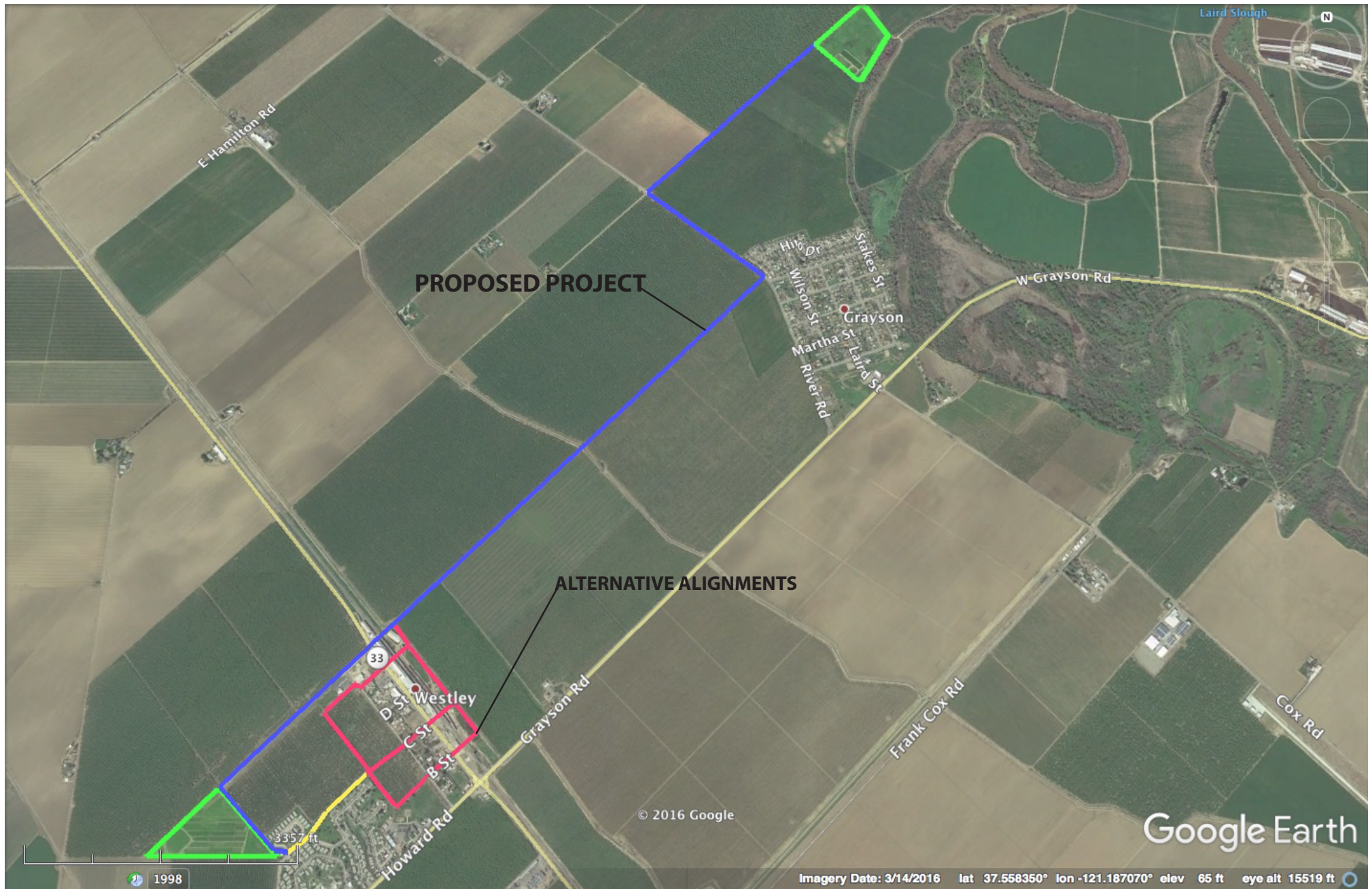
## 2.5 Permits and Approvals

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It is anticipated that the project would be funded by the State Water Resources Control Board (SWRCB) through its Clean Water State Revolving Fund (SRF) program. The application will include a NEPA (CEQA+) Environmental Package, a Technical Package and a Financial Security Package. The SWRCB must approve the application and a finalized agreement must be executed before funding is disbursed. Project operations would require amended WDRs from the SWRCB through the RWQCB, Central Valley Region.

A portion of the sewer line would cross beneath SR 33, which would require an encroachment permit from the California Department of Transportation (Caltrans). The proposed sewer line would also cross beneath the UPRR tracks, requiring railroad permission. Stanislaus County would require an encroachment permit for portions of the force main parallel to and crossing River Road. Approval would need to be obtained from WSID for irrigation canal crossings.





I:\1\13016 WESTLEY SEWER\DOCS\PROJECT REPORT\CAD\N USE (FOR REPORT)\DRAFT FINAL\FIGURE 5-18\_ALT 6 SITE PLAN.DWG PLOT: 9/14/2016 3:22:59 PM BY PATRICK SCOTT



**BLACKWATER**  
CONSULTING ENGINEERS, INC.  
605 STANDFORD AVE., SUITE N, MODESTO, CA 95350 PH. 209.322.1820

# 3.0 ENVIRONMENTAL CHECKLIST FORM

## 3.1 AESTHETICS

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Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?				√
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				√
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			√	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				√

## NARRATIVE DISCUSSION

### Environmental Setting

The project site lies in a predominantly rural area in the western portion of Stanislaus County. Most of the project area is within agricultural fields of row crops and orchards, along with scattered rural residences and farm buildings. Agricultural fields dominate the landscape between Westley and Grayson and to the north of Grayson. A portion of the project area is within the community of Westley, a mostly residential small town that includes the Westley Farm Labor Housing Complex. Some light industrial and warehouse uses are located along SR 33 to the east. A portion of the project area is near the community of Grayson, a larger community that is also predominantly residential but has commercial and recreational land uses. Grayson is adjacent to and west of the San Joaquin River, which has a thick riparian forest of trees and shrubs along its banks.

Interstate 5, approximately 3 miles southwest of Westley, is the approximate boundary between the San Joaquin Valley and the Coast Ranges. The Coast Ranges to the west constitute the major scenic vista in the area. Views of the Sierra Nevada to the east are available when visibility conditions permit. Caltrans has designated the entire segment of Interstate 5 within Stanislaus County as a State scenic highway (Caltrans 2015).

Lighting in Westley consists mainly of lights from residences and Grayson Charter School, and street lights at the Westley Farm Labor Housing Complex. More street lighting is found in Grayson, along with lights from residences and businesses. Most of the project area is located in areas without lights, mainly agricultural fields.

## Environmental Impacts and Mitigation Measures

### a) Scenic Vistas.

The project would consist primarily of a force main that would be installed underground. The portion of the project at the Grayson WWTP site would be primarily aeration and stabilization ponds and a land disposal area. These facilities would not obstruct existing vistas of the Coast Ranges or the Sierra Nevada. The project would have no impact on this issue.

### b) Scenic Routes and Resources.

The riparian vegetation along the San Joaquin River is the main scenic resource in the vicinity of the project. The project would not affect this resource, as no construction work would occur there. No other scenic resources have been identified in the area. No mature, non-orchard trees would be removed as part of the project. The project would not affect the segment of Interstate 5 designated as a California State Scenic Highway, as the project area is located several miles to the east. The project would have no impact on this issue.

### c) Visual Character and Quality.

Temporary visual impacts may occur in some areas due to trenching and ground disturbance associated with construction activities. Installation of the force main at the SR 33, UPRR, and WSID crossings would involve directional drilling, which would have less of a visual impact than conventional trenching. As the force main would be buried underground and facilities at the Grayson WWTP site would be out of public view and located on a disturbed site, impacts on visual character are considered less than significant.

### d) Light and Glare.

The project would not involve any new lighting or structures with reflective materials or coatings, so the project would not affect day or nighttime views in the project vicinity as a result of light or glare. The project would have no impact on this issue.

## 3.2 AGRICULTURE AND FORESTRY RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				√
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				√

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

			√
			√
			√

d) Result in the loss of forest land or conversion of forest land to non-forest use?

e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

## NARRATIVE DISCUSSION

### Environmental Setting

Agriculture is the predominant land use in Stanislaus County, with approximately 80.3% of the county’s land area in farms (U.S. Department of Agriculture 2014). More than half of the project area is within agricultural land, and other agricultural portions border such lands. Agricultural uses in the vicinity are mainly orchards and row crops. In the Westley area, almonds were observed as the predominant crop. In the Grayson area, peaches, almonds and cantaloupes were observed by BaseCamp Environmental staff in June 2016.

The Important Farmland Maps, prepared by the California Department of Conservation as part of the Farmland Mapping and Monitoring Program, designate the viability of lands for farmland use, based on the physical and chemical properties of the soils. The maps categorize farmland, in decreasing order of importance, as "Prime Farmland," "Farmland of Statewide Importance," "Unique Farmland," and "Farmland of Local Significance." Collectively, these categories are referred to as “Important Farmland”. There are also designations for grazing land and for urban/built-up areas. According to the 2014 Important Farmland Map of Stanislaus County (FMMP 2014), most of the force main alignment is located within land designated as Prime Farmland. Portions of the alignment located in Westley and near Grayson are on lands classified Urban and Built-Up Land. The Grayson WWTP site is classified as Vacant or Disturbed Land.

The Williamson Act is State legislation that seeks to preserve farmland by offering property tax breaks to farmers who sign a contract pledging to keep their land in agricultural use. Several parcels in or near the project area are under a Williamson Act contract.

There are no forest lands in the project area as designated by federal, State, or local agencies. Because of this, forestry resources will not be discussed further in this document.

### Environmental Impacts and Mitigation Measures

a) Agricultural Land Conversion.

The segment of the force main from SR 33 to the Grayson WWTP site would be installed along agricultural roads and buried beneath lands used for agricultural production. The force main would not require the permanent use of existing farmland; no agricultural land would be converted to non-agricultural uses. New facilities would be constructed within the existing

Grayson WWTP site, but the site is already partially developed, and the project would not convert land classified as agricultural. The portion of the project within Westley would be within a developed area. The project would have no impact on this issue.

b) Agricultural Zoning and Williamson Act.

The proposed force main would run through land zoned for agriculture. As discussed in a) above, it would not interfere with any agricultural operations on these lands once it is installed. While some parcels along the main alignment are under Williamson Act contracts, the project would not lead to a loss of agricultural uses on this land. The project would involve no conflict with agricultural zoning or Williamson Act contracts.

c, d) Forest Land Conversion and Zoning.

As noted above, there is no designated forest land in the project vicinity. The project would have no impact on forest lands.

e) Indirect Conversion of Farmland and Forest Land.

The project would not involve any conflict with, or have an adverse effect on, the ongoing and continued use of agricultural land in the project vicinity. The project would not facilitate development or conversion of surrounding agricultural lands. As discussed in Section 3.13, Population and Housing, the project would at most induce limited development in Westley, and any such development would be confined to the existing developed area. The project would not contribute indirectly to conversion of off-site farmland. Since there is no designated forest land in the area, the project would have no effect on potential for conversion of forestland to non-forest use.

### 3.3 AIR QUALITY

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable Air Quality Attainment Plan?				√
b) Violate any air quality standard or contribute to an existing or projected air quality violation?			√	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?				√
d) Expose sensitive receptors to substantial pollutant concentrations?			√	
e) Create objectionable odors affecting a substantial number of people?			√	

# NARRATIVE DISCUSSION

## Environmental Setting

The project area is located within the San Joaquin Valley Air Basin. The San Joaquin Valley Air Pollution Control District (SJVAPCD), which includes Stanislaus County, has jurisdiction over most air quality matters in the San Joaquin Valley Air Basin. The SJVAPCD is tasked with implementing programs and regulations required by the federal and California Clean Air Acts. Under their respective Clean Air Acts, both the State of California and the federal government have established ambient air quality standards for six criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. California has four additional criteria pollutants under its Clean Air Act. Table 3-1 shows the current attainment status of the Air Basin relative to the federal and State ambient air quality standards for criteria pollutants.

TABLE 3-1  
AIR BASIN ATTAINMENT STATUS WITH  
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Criteria Pollutant	Designation/Classification	
	Federal Primary Standards	State Standards
Ozone - One hour	No Federal Standard	Nonattainment/Severe
Ozone - Eight hour	Nonattainment/Extreme	Nonattainment
PM <sub>10</sub>	Attainment	Nonattainment
PM <sub>2.5</sub>	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO <sub>x</sub> )	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead	No Designation/Classification	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

*Source: SJVAPCD 2015a.*

The San Joaquin Valley Air Basin is designated a non-attainment area for ozone. Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and nitrogen oxides (NO<sub>x</sub>), react in the atmosphere in the presence of sunlight to form ozone. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials.

The Air Basin is also designated a non-attainment area for respirable particulate matter, a mixture of solid and liquid particles suspended in air, including dust, pollen, soot, smoke, and liquid droplets. In Stanislaus County, particulate matter is generated by a mix of rural and urban sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled; consequently, both the federal and state air quality standards for particulate matter apply to particulates 10 microns or less in diameter (PM<sub>10</sub>) as well as to particulates less than 2.5 microns in diameter (PM<sub>2.5</sub>), which are carried deeper into the lungs. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, coughing, bronchitis, and respiratory illnesses in children.

Carbon monoxide (CO) is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels and is emitted directly into the air, unlike ozone. The main source of CO in the San Joaquin Valley is on-road motor vehicles (SJVAPCD 2015b). High CO concentrations occur in areas of limited geographic size, sometimes referred to as “hot spots,” which are ordinarily associated with areas of highly congested traffic.

In addition to the criteria pollutants, the California Air Resources Board has also identified other air pollutants as toxic air contaminants (TACs) - pollutants that may cause acute serious, long-term effects, such as cancer, even at low levels. Diesel particulate matter is the most commonly identified TAC, generated mainly as a product of combustion in diesel engines. Other TACs are less common and are typically associated with industrial activities.

As previously noted, the SJVAPCD has jurisdiction over most air quality matters in the Air Basin. It implements the federal and California Clean Air Acts, and the applicable attainment and maintenance plans, through local regulations. The SJVAPCD regulations that would be applicable to the project are summarized below.

*Regulation VIII (Fugitive Dust PM10 Prohibitions)*

Rules 8011-8081 are designed to reduce PM10 emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track out, landfill operations, etc.

*Rule 4101 (Visible Emissions)*

This rule prohibits emissions of visible air contaminants to the atmosphere and applies to any source operation that emits or may emit air contaminants.

## Environmental Impacts and Mitigation Measures

In 2015, the SJVAPCD adopted a revised Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI). GAMAQI defines an analysis methodology, thresholds of significance, and mitigation measures for the assessment of air quality impacts for projects within SJVAPCD's



jurisdiction (SJVAPCD 2015b). Table 3-2 shows the CEQA thresholds for significance for pollutant emissions within the SJVAPCD. The significance thresholds apply to emissions from both project construction and project operations.

Construction of the project would generate air pollutant emissions from construction equipment and vehicles, primarily from installation of the force main. An estimate of the total emissions from main construction was developed using the Road Construction Emissions Model (RCEM). Although the RCEM was developed for road projects, it is adaptable to linear projects such as force mains. The RCEM results are shown in Appendix A of this document. The estimated emissions from main installation, assumed to occur in 2018, are shown in Table 3-2.

**TABLE 3-2  
ESTIMATED AIR POLLUTANT EMISSIONS  
FROM FORCE MAIN CONSTRUCTION**

<b>Pollutant</b>	<b>SJVAPCD Significance Threshold</b>	<b>Project Construction Emissions</b>	<b>Exceeds Threshold?</b>
CO	100	2.6	No
NO <sub>x</sub>	10	3.9	No
ROG	10	0.4	No
PM <sub>10</sub>	15	0.2	No
PM <sub>2.5</sub>	15	0.2	No

Sources: Road Construction Emissions Model v. 7.1.5.1; SJVAPCD 2015b

a) Air Quality Plan Consistency.

The project would not generate any air pollutant emissions once construction work is completed. The project would have no impact regarding consistency with applicable air quality plans.

b) Violation of Air Quality Standards.

The project would not involve any operational emissions. As shown in Table 3-2 above, estimated project construction air emissions would be minor, short-term and substantially below the applicable significance thresholds adopted by the SJVAPCD.

Project construction may generate localized dust emissions at levels above existing ambient conditions. The project would be required to implement the provisions of SJVAPCD Regulation VIII, which are designed to reduce fugitive dust emissions from construction activities. The GAMAQI states that compliance with Regulation VIII would reduce dust impacts to a level that would be less than significant.

c) Cumulative Emissions.

The project would not generate any pollutant emissions after completion of construction work. The project would have no impact on cumulative air pollutant emissions.

d) Exposure of Sensitive Receptors.

The project would not generate any substantial or long-term air emissions that have the potential to affect sensitive receptors in the project area. The nearest sensitive receptors are the residences in the Westley Farm Labor Housing Complex and the Grayson Charter School. The school is approximately 1,000 feet from the force main alignment. It is unlikely that the school would be exposed to dust emissions from construction activities, particularly with implementation of SJVAPCD Regulation VIII provisions.

Project work within and near the housing complex would generate emissions of criteria pollutants and diesel particulate matter (a TAC). Construction activities in this area would occur for a short time, so residents would not experience prolonged exposure to pollutant emissions. Health impacts would occur only with long-term exposure. In addition, dust emissions that could potentially reach these receptors would be controlled through compliance with SJVAPCD Regulation VIII. Project impacts are considered less than significant.

e) Odors.

The project does not involve any features that would generate noticeable odors during either construction or operation, except possibly at the Grayson WWTP site. The Grayson WWTP is approximately 1 mile away from residential development, but it is likely any odors generated at the WWTP site would dissipate before reaching these residences. An inquiry to SJVAPCD revealed that no odor complaints related to the Grayson WWTP have been filed. Project impacts related to odors are considered less than significant.

### 3.4 BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Adversely impact, either directly or through habitat modifications, any endangered, rare, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?	√			
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?		√		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		√		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	√			

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

			√
			√

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?

## NARRATIVE DISCUSSION

### Environmental Setting

The setting description in this section is based upon a biological assessment prepared in 2017 by Moore Biological Consultants. Appendix B contains the biological assessment for the project. The assessment consisted of a search of the California Natural Diversity Database (CNDDDB), an IPac Trust Resource Report from the U.S. Fish and Wildlife Service (USFWS), and a field survey.

Surrounding land uses in this part of Stanislaus County are primarily agricultural, with scattered residences and rural communities. The project site is in an area that primarily consists of leveled fields intensively farmed in orchard crops and annual crops. The project site also includes the two developed WWTPs and residential, commercial, and industrial neighborhoods in the vicinity of Westley.

### Vegetation

The majority of the area where new project facilities are proposed support highly disturbed ruderal grassland vegetation. There are also narrow strips of highly disturbed ruderal grassland vegetation along the edges of River Road, and agricultural fields, dirt roads, irrigation and/or drainage ditches, and canals in the area. Vegetation in these areas consists almost entirely of non-native grasses and weeds. Oats, soft chess brome, ripgut brome, foxtail barley, and perennial ryegrass are some of the most common grasses in the ruderal grassland vegetation. Other grassland species are intermixed with the grasses, such as yellow star-thistle, black mustard, prickly lettuce, common groundsel, bull thistle, rancher’s fireweed, common sunflower, common mallow, and filaree.

The wastewater disposal areas at each of the WWTPs are vegetated with upland species, wetland species, or a mixture of both, depending on how recently water has been delivered to the areas. If not used for a period of time, the shallow ponds support ruderal upland grassland vegetation. Under wetter conditions, the ponds support hydrophytic (i.e., wetland) vegetation such as rabbit’s foot grass, perennial ryegrass, Johnson grass, Mediterranean barley, and umbrella sedge. A subset of these same hydrophytic species occur in the dirt-lined irrigation and drainage laterals and ditches in the site.

Trees in and near the project site include orchard trees, riparian trees, and a variety of ornamentals. There are California fan palm, blue gum, ornamental pine, black walnut, and other ornamental trees in the vicinity of Westley. Dominant trees in the San Joaquin River riparian habitats adjacent to the Grayson WWTP site include valley oak, Fremont cottonwood, black walnut, white alder, and willows. No blue elderberry shrubs were observed within the project

area, but there are some planted elderberry shrubs in a conservation area just north of the Grayson WWTP.

## Wildlife

A variety of bird species were observed in the area: mallard, great egret, turkey vulture, red-tailed hawk, acorn woodpecker, American crow, mourning dove, killdeer, northern mockingbird, Brewer's blackbird, and red-winged blackbird. All of these are species commonly found in agricultural areas in the greater project vicinity. The project area is primarily orchards and open fields, and there are limited potential nest trees within or near the project site that are suitable for nesting raptors, including Swainson's hawk. During the survey, a Swainson's hawk was observed perched on a telephone pole in the middle of the Grayson WWTP disposal area. A few red-tailed hawks were also observed. Given the presence of trees and shrubs in and near the site, it is likely one or more pairs of raptors and a variety of songbirds nest in and/or near the site during most years. It is also likely that ground-nesting songbirds, such as killdeer and red-winged blackbird, nest in the grassland habitats in the site.

A variety of mammals are likely to occur in the project area. During the survey, California ground squirrel, black-tailed hare, pocket gopher, and desert cottontail were observed. Coyote, striped skunk, and Virginia opossum are expected to occur at the project site. Along with the California ground squirrels, there were ground squirrel burrows scattered throughout the area. A number of species of small rodents are likely to occur, including mice and voles. Based on habitat types present, only a few amphibian and reptile species are expected to use habitats in the area. Western fence lizard was the only reptile observed; no amphibians were observed. Common species such as Pacific chorus frog, gopher snake, common king snake, and common garter snake are expected to occur in the area.

## Waters of the U.S.

Waters of the U.S., including wetlands, are broadly defined under 33 Code of Federal Regulations (CFR) 328 to include navigable waterways, their tributaries, and adjacent wetlands. The definition encompasses Territorial Seas, Tidal Waters, and Non-Tidal Waters; Non-Tidal Waters includes interstate and intrastate rivers and streams, as well as their tributaries. The limit of federal jurisdiction of Non-Tidal Waters of the U.S. extends to the "ordinary high water mark". The ordinary high water mark is established by physical characteristics such as a natural water line impressed on the bank, presence of shelves, destruction of terrestrial vegetation, or the presence of litter and debris.

Jurisdictional wetlands are vegetated areas that meet specific vegetation, soil, and hydrologic criteria defined by the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual and Regional Supplement. Jurisdictional wetlands and Waters of the U.S. include, but are not limited to, perennial and intermittent creeks and drainages, lakes, seeps, and springs; emergent marshes; riparian wetlands; and seasonal wetlands. Jurisdictional wetlands are usually adjacent to or hydrologically associated with Waters of the U.S. Isolated wetlands are outside federal jurisdiction, but they may be regulated by State agencies such as the California Department of Fish and Wildlife (CDFW) and the Regional Water Quality Control Board (RWQCB).

Wetlands and Waters of the U.S. provide critical habitat components, such as nest sites and a reliable source of water, for a wide variety of wildlife species. State and federal agencies regulate these habitats, and Section 404 of the Clean Water Act requires that a permit be secured prior to the discharge of dredged or fill materials into any waters of the U.S., including wetlands. The USACE manages the Section 404 permit program.

## Special-Status Species

Special-status species are plants and animals that are legally protected under the federal Endangered Species Act (ESA), the California Endangered Species Act (CESA), or other regulations. Special-status wildlife species includes species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat. Special-status plants are those which are designated rare, threatened, or endangered and candidate species for listing by the USFWS, or considered rare or endangered under the conditions of CEQA Guidelines Section 15380, such as those plant species identified on Lists 1A, 1B and 2 in the Inventory of Rare and Endangered Vascular Plants of California. They also may include other species that are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those included on CNPS List 3.

Table 3 of the biological assessment (see Appendix B) provides a summary of the listing status and habitat requirements of special-status plant and wildlife species that have been documented in the greater project vicinity or for which there is potentially suitable habitat in the project area. This table also includes an assessment of the likelihood of occurrence of each of these species in the site. The evaluation of the potential for occurrence of each species is based on the distribution of regional occurrences (if any), habitat suitability, and field observations.

## Biological Resource Conservation Plans and Statutes

The ESA declares that all federal departments and agencies shall utilize their authority to conserve endangered and threatened plant and animal species. CESA parallels the policies of ESA and pertains to native California species. Both ESA and CESA prohibit unauthorized “take” (i.e., killing) of listed species, with take broadly defined in both acts to include activities such as harassment, pursuit and possession. Along with ESA and CESA, the federal Migratory Bird Treaty Act and the California Fish and Game Code protect special-status bird species year-round, as well as their eggs and nests during the nesting season. The California Fish and Game Code also provides protection for mammals and fish.

The Stanislaus County General Plan contains policies to protect and enhance oak woodlands and other native hardwood habitat, but the County does not have a tree preservation ordinance at this time. There are no habitat conservation plans (HCPs) or similar conservation plans applicable to Stanislaus County specifically. In 2007, the PG&E San Joaquin Valley Operations and Maintenance HCP was adopted, which covers all or part of nine counties within the San Joaquin Valley, including Stanislaus County. The HCP covers 23 wildlife and 42 plant species for 33 routine operations and maintenance activities for PG&E’s electrical and gas transmission and distribution systems. This HCP applies only to PG&E’s gas and electrical transmission and distribution facilities, lands, access routes, minor expansion areas, and mitigation areas.

## Environmental Impacts and Mitigation Measures

### a) Special-Status Species.

The biological assessment noted that only six species of special-status plants were identified in the CNDDDB search: big tarplant, round-leaved filaree, Lemmon’s jewelflower, Delta button celery, diamond-petaled California poppy, and California alkali grass. No special-status plants were included in the USFWS IPaC Trust Resource Report. Most of the special-status plants identified in the CNDDDB query occur in relatively undisturbed areas within vegetation

communities such as marshes, swamps, alkali playas, vernal pools, and chenopod scrub. None of these habitat types occur in the project area. Due to lack of suitable habitat, no special-status plant species are expected to occur. The wastewater disposal areas and areas of ruderal grassland vegetation in the project area are highly disturbed and do not provide suitable habitat for any special-status plants.

The potential for intensive use of habitats within the project site by special-status wildlife species is generally low. Special-status wildlife species that have been recorded in greater project vicinity in the CNDDDB include Swainson's hawk, burrowing owl, tricolored blackbird, least Bell's vireo, song sparrow, San Joaquin kit fox, riparian brush rabbit, California tiger salamander, steelhead, hardhead, vernal pool fairy shrimp, and valley elderberry longhorn beetle. Although not included in the CNDDDB search result, giant garter snake, California red-legged frog, delta smelt, Conservancy fairy shrimp, and vernal pool tadpole shrimp were added to Table 3 in the biological assessment because they are included in the USFWS IPaC Trust Resource Report. The project site and surrounding areas may have provided habitat for the special-status wildlife species listed in Table 3 at some time in the past. However, farming, development, and construction and maintenance of roads, fences, and irrigation facilities have substantially modified natural habitats. Of the wildlife species identified in the CNDDDB, Swainson's hawk and burrowing owl are the only species that have much potential to occur in the project site on more than a transitory or very occasional basis. These two species are discussed below.

*Swainson's Hawk.* Swainson's hawk is listed under CESA as a threatened species. The Migratory Bird Treaty Act and Fish and Game Code of California protect Swainson's hawks year-round, as well as their nests during the nesting season (March 1 through September 15). Swainson's hawk are found in the Central Valley primarily during their breeding season, a population is known to winter in the San Joaquin Valley. Swainson's hawks prefer nesting sites that provide sweeping views of nearby foraging grounds consisting of grasslands, irrigated pasture, hay, and wheat crops. Most Swainson's hawks are migratory, wintering in Mexico and breeding in California and elsewhere in the western United States. This raptor generally arrives in the Central Valley in mid-March, and begins courtship and nest construction immediately upon arrival at the breeding sites. The young fledge in early July, and most Swainson's hawks leave their breeding territories by late August.

The CNDDDB (2017) contains only a few records of Swainson's hawks in the greater project vicinity. The nearest occurrence of nesting Swainson's hawks in the CNDDDB search area is a historical record of an adult pair seen foraging and nesting along the Tuolumne River approximately a quarter mile east of the confluence with the San Joaquin River; this location is 2.5 miles northeast of the Grayson WWTP. A Swainson's hawk was seen during the survey perched on a telephone pole at the Grayson WWTP. The annual cropland and grasslands in the region provide suitable foraging habitat for this species; the on-site grasslands provide low quality foraging habitat. There are only a few suitable nest trees for Swainson's hawk in or immediately adjacent to the project area. In contrast, there are numerous suitable nest trees in the greater project vicinity, primarily along the river corridor near the Grayson WWTP.

*Burrowing Owl.* Burrowing owl is listed as a Species of Special Concern by the State of California. The Migratory Bird Treaty Act and California Fish and Game Code protect burrowing owls year-round, as well as their nests during the nesting season (February 1 through August 31). Burrowing owls are a year-long resident in a variety of grasslands as well as scrub lands that have a low density of trees and shrubs with low growing vegetation; burrowing owls that nest in the Central Valley may winter elsewhere. The

primary habitat requirement of the burrowing owl is small mammal burrows for nesting. The owl usually nests in abandoned ground squirrel burrows, although they have been known to dig their own burrows in softer soils. In urban areas, burrowing owls often utilize artificial burrows including pipes, culverts, and piles of concrete pieces. This semi-colonial owl breeds from March through August, and is most active while hunting during dawn and dusk.

The nearest occurrence of this species in the CNDDDB search area is approximately 2 miles northeast of the Grayson WWTP, near the confluence of the Tuolumne River and the San Joaquin River. The record was an adult burrowing owl near a burrow under an exposed aggregate slab associated with a culvert. The intensity of development, irrigation, and cultivation within and surrounding the site reduces the likelihood of burrowing owls using the site for nesting. No burrowing owls were observed in the project site during the recent survey. Several clusters of ground squirrel burrows were observed in the site, providing possible burrow habitat for burrowing owls. However, none of these burrows had evidence of burrowing owl occupancy.

Both species could be disturbed by noise from project construction if they nested on or near the project site during construction. This would be a potentially significant impact, as the noise could disrupt nesting behaviors. Mitigation measures presented below would minimize disruptions to nesting Swainson's hawk and burrowing owl, thereby reducing potential impacts to a level that would be less than significant.

Level of Significance: Potentially significant

Mitigation Measures:

BIO-1: If construction commences between March 1 and September 15, then pre-construction surveys for nesting Swainson's hawks shall be conducted within 0.5 miles of the project construction area. If active nests are found, then a qualified biologist shall determine the need for any temporal restrictions on construction. The determination shall be made pursuant to criteria set forth by CDFW in its 1994 Staff Report Regarding Mitigation for Impacts to Swainson's Hawk (*Buteo swainsoni*) in the Central Valley of California. No further mitigation shall be implemented if no active Swainson's hawk nests are found, and no mitigation need be implemented if construction activities occur outside the nesting season.

BIO-2: If construction commences between February 1 and August 31, then pre-construction surveys for burrowing owls shall be conducted within 250 feet of the project construction area. If occupied burrows are found, a qualified biologist should determine the need for any temporal restrictions on construction. The determination shall be made pursuant to criteria set forth by CDFW in its 2012 Staff Report on Burrowing Owl Mitigation. No further mitigation shall be implemented if no active burrows are found, and no mitigation need be implemented if construction activities occur outside the nesting season.

Significance After Mitigation: Less than significant

b) Riparian and Other Sensitive Habitats.

The biological assessment noted that no riparian habitats or other sensitive natural communities were observed in the project area. The San Joaquin River riparian corridor is located near the Grayson WWTP site, but no project work would occur in this corridor. Project impacts are considered less than significant.

c) Wetlands.

The biological assessment did not observe any wetlands or jurisdictional waters in the project area. The force main in alignments along paved roads and farm roads would be constructed in the roads themselves or on road shoulders, in orchards, or in disturbed upland ruderal grassland vegetation. WSID Lateral 2 South and Lateral 3 South convey water that is lifted up and out of the San Joaquin River. Because of this, they are not under USACE jurisdiction. The wastewater disposal areas in the Grayson WWTP and Westley WWTP where project facilities would be constructed would be entirely vegetated in upland grasses and weeds absent wastewater being delivered to those areas. The artificial wetlands present in the wastewater disposal areas are not under USACE jurisdiction. Project impacts on wetlands and Waters of the U.S. are considered less than significant.

d) Fish and Wildlife Movement.

Trees, shrubs, and grasslands in the project area could be used by birds protected by the Migratory Bird Treaty Act of 1918 and/or the California Fish and Game Code. Project construction could potentially affect these resources, which could disrupt nesting behaviors. Mitigation prescribed below would minimize disruption of nesting should it occur, thereby reducing impacts to a level that would be less than significant.

Level of Significance: Potentially significant

Mitigation Measures:

BIO-3: If construction commences during the general avian nesting season (March 1 through July 31), then pre-construction surveys for nesting birds shall be conducted within 0.25 miles of the project construction area. If active nests are found, then work in the vicinity of the nest shall be delayed until the young have fledged. No further mitigation shall be implemented if no active bird nests are found, and no mitigation need be implemented if construction activities occur outside the general avian nesting season.

Significance After Mitigation: Less than significant

e) Local Biological Requirements.

As noted above, while the County has General Plan policies to protect and enhance oak woodlands and other native hardwood habitat, it does not have a tree preservation ordinance at this time. There are no oak woodlands or hardwood habitat on the project site. There are no other local ordinances that would be applicable to biological resources in the project area. The project would have no impact on this issue.



f) Conflict with Habitat Conservation Plans.

As noted above, no HCPs or similar conservation plans are applicable to the project site. The project would have no impact on this issue.

### 3.5 CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?			√	
b) Cause a substantial adverse change in the significance of a unique archaeological resource (i.e., an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it contains information needed to answer important scientific research questions, has a special and particular quality such as being the oldest or best available example of its type, or is directly associated with a scientifically recognized important prehistoric or historic event or person)?		√		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		√		
d) Disturb any human remains, including those interred outside of formal cemeteries?			√	

## NARRATIVE DISCUSSION

### Environmental Setting

The setting description in this section is based upon a cultural resource study prepared in 2017 by Solano Archaeological Services. Appendix C of this IS/MND contains a copy of this study.

### Physical Setting

The project lies near the western edge of California’s Central Valley. The northern portion of the valley is drained by the Sacramento River; the southern portion is drained by the San Joaquin River. The two rivers merge north of the project area, forming a system of channels and marshes comprising the California Delta, which flows into Suisun Bay.

### Prehistoric Era Background

Prehistoric populations were concentrated along the resource-rich river channels and throughout the Delta. Archaeologists have recovered a great deal of data from sites occupied beginning in the Middle Archaic period (3,000-1,000 BC). Substantial evidence exists of hunting, fishing,

gathering, basketry, baked clay artifacts, worked shell and bone, ceramics, trade, and distinctive burial practices.

The project area is located within territory claimed by the Northern Valley Yokuts. The Yokuts occupied an extensive area, from the Coast Ranges to the Sierra Nevada foothills, and from the American River to near Tulare Lake. The late prehistoric Yokuts may have been the largest ethnic group in pre-contact California. The Yokuts' basic political unit was the triblet, populated by a few hundred to a few thousand occupants. Structures ranged from single-family dwellings to multi-family communal structures, and included sweat houses and ceremonial lodges.

## Historic Era Background

The Spanish Period in “Alta California” began in 1775 when the Ayala expedition reached the San Francisco Bay area searching for a suitable location for a mission; soon a series of missions had been established up and down California. Following Mexican independence from Spain in 1821, much of the land surrounding missions, as well as outlying areas, was ceded to wealthy Spanish ranchers as Mexican land grants. The Project site lies within the El Pescadero land grant, a 35,446-acre property in Stanislaus County and San Joaquin County, given in 1843 by Governor Manuel Micheltonena to Valentin Higuera and Rafael Feliz. The grant extended along the west bank of the San Joaquin River from Banta on the north to Del Puerto Creek and Rancho Del Puerto on the south, and encompassed present-day Grayson.

During the Spanish Period, many Yokuts were lured or captured by missionaries and scattered among the various missions. Those tribe members who were not abducted, or who escaped the missions and returned to their homes, faced conflict for resources with Spanish and Mexican herders. The malaria epidemic of 1833 decimated the indigenous population, killing thousands of the tribesmen. The influx of Europeans during the Gold Rush era further reduced the population due to disease and violent relations with the miners. Though there was no gold within the Yokuts territory, miners passing through on their way to the diggings caused considerable upheaval.

After the initial fever of the Gold Rush, numerous former miners, who had seen the richness of the San Joaquin Valley on their way to the gold fields, returned to settle and farm the area. Grayson was established in 1850 at an important San Joaquin River crossing used during the Gold Rush era, and for agricultural products thereafter. Grayson declined rapidly after the railroad supplanted river transportation.

A records search provided on June 12, 2017 by the Central California Information Center at California State University Stanislaus indicated there is one previously recorded historic resource located within the project footprint, the WSID Lateral 3 South Canal. There is one additional resource within a mile of the project site; this is the town of Grayson, which has been designated as a State Point of Historical Interest. An intensive pedestrian survey of the project area conducted on June 21, 2017 yielded nine historic resources: two WSID canals, six historic roads, and a segment of the Southern Pacific Railroad.

## Paleontological Resources

Geological materials underlying the project site and vicinity include the recent (Quaternary) sedimentary deposits of the Modesto Formation (Wagner et al. 1991). Numerous vertebrate fossil sites have been associated with the Modesto Formation in the Central Valley, including land mammals, birds, reptiles, and amphibians (California High Speed Rail Authority 2012). The project site does not contain any known paleontological resources or unique geological features.

## Environmental Impacts and Mitigation Measures

### a) Historical Resources.

As noted above, nine potential historical resources were identified during a pedestrian survey of the project area. An analysis of all historic resources within the project footprint was undertaken. According to California Register of Historical Resources (CRHR) criteria, none of these resources is eligible for listing on the CRHR. Based on this analysis, project impacts on historical resources are considered less than significant.

### b) Archaeological Resources.

The existence of archaeological resources at the project area is unknown. Given past disturbance of the project area by agricultural operations and other development, it is unlikely that intact cultural resources would be encountered. However, locations near the San Joaquin River have been known to yield such resources. It is conceivable that excavations associated with the project could unearth archaeological materials of significance. The establishment of procedures to address archaeological discoveries if they should occur would reduce any potential impacts to a less than significant level. These procedures are set forth in the following mitigation measure.

Level of Significance: Potentially significant

Mitigation Measures:

CULT-1: If any subsurface cultural or paleontological resources are encountered during construction of the project, all construction activities in the vicinity of the encounter shall be halted until a qualified archaeologist, or paleontologist as appropriate, can examine these materials, make a determination of their significance and, if significant, recommend further mitigation measures that would reduce potential effects to a less than significant; such measures could include 1) preservation in place or 2) excavation, recovery and curation by qualified professionals. The Community Services District shall be responsible for retaining qualified professionals, implementing recommended mitigation measures and documenting mitigation efforts in a written report, consistent with the requirements of the CEQA Guidelines.

Significance After Mitigation: Less than significant

### c) Paleontological Resources and Unique Geologic Features.

The project area is predominantly flat land and contains no geologic features that may be considered unique. The project area is not in a location where paleontological materials are considered likely, and past disturbance of the project area makes it unlikely that such resources would be encountered. It is conceivable that excavation associated with the project could unearth paleontological materials of significance. The establishment of procedures to address paleontological discoveries if they should occur would reduce any potential impacts to a less than significant level. These procedures are set forth in Mitigation Measure CULT-1 above.

d) Human Burials.

Given past disturbance of the project area, it is not expected that the project area would uncover any human burials. Even so, it is conceivable that excavation associated with the project could uncover a previously unknown burial.

CEQA Guidelines Section 15064.5(e) describes the procedure to be followed when human remains are uncovered in a location outside a dedicated cemetery. All work in the vicinity of the find shall be halted and the County Coroner shall be notified to determine if an investigation of the death is required. If the County Coroner determines that the remains are Native American in origin, then the County Coroner must contact the Native American Heritage Commission within 24 hours. The Native American Heritage Commission shall identify the most likely descendants of the deceased Native American, and the most likely descendants may make recommendations on the disposition of the remains and any associated grave goods with appropriate dignity. If a most likely descendant cannot be identified, the descendant fails to make a recommendation, or the landowner rejects the recommendations of the most likely descendant, then the landowner shall rebury the remains and associated grave goods with appropriate dignity on the property in a location not subject to further disturbance.

Compliance with CEQA Guidelines Section 15064.5(e) would ensure that impacts on any human remains encountered during project construction would be less than significant.

### 3.6 GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
- ii) Strong seismic ground shaking?
- iii) Seismic-related ground failure, including liquefaction?
- iv) Landslides?

b) Result in substantial soil erosion or the loss of topsoil?

c) Be located on strata or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

				√
			√	
	√			
				√
			√	
				√

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property?

	√		
			√

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

## NARRATIVE DISCUSSION

### Environmental Setting

The project area lies in the San Joaquin Valley, which is located in the southern portion of the Great Valley Geomorphic Province. The Great Valley, also known as the Central Valley, is a topographically flat, northwest-trending, structural trough (or basin) about 50 miles wide and 450 miles long. It is bordered by the Tehachapi Mountains on the south, the Klamath Mountains on the north, the Sierra Nevada on the east, and the Coast Ranges on the west. The San Joaquin Valley is filled with thick sedimentary rock sequences that were deposited as much as 130 million years ago. The sediments that form the Valley floor were derived largely from erosion of the Sierra Nevada.

The Geologic Map of the San Francisco-San Jose Quadrangle (Wagner et al. 1991) designates the underlying geology the project area as alluvial fan deposits – deposits of sediments left by streams coming down from the mountains. Large alluvial fans have developed on each side of the Valley, with the larger and more gently sloping fans on the east side. These fans overlie metamorphic and igneous basement rocks, which are exposed in the Sierra Nevada foothills and consist of metasedimentary, volcanic, and granitic rocks. The smaller and steeper slopes on the west side of the Valley overlie sedimentary rocks more closely related to the Coast Ranges.

Most of the soils located within the San Joaquin Valley consist of sand, silt, loamy clay alluvium, peat, and other organic sediments. These soils are the result of long-term natural soil deposition and the decomposition of marshland vegetation. According to a custom soil resource report (USDA NRCS 2016), there are three main soils in the project area:

Capay clay. This very deep, moderately well drained, nearly level soil is in interfan basins. It formed in alluvium from sandstone and shale. Permeability is slow in this soil. Runoff is negligible to medium, and the hazard of water erosion is slight. The hazard of wind erosion is considered low. The shrink-swell potential of this soil is high. The risk of corrosion is high for uncoated steel and low for concrete. This soil underlies most of the project area.

Columbia complex. This very deep, somewhat poorly drained, nearly level soil is on floodplains. It formed in alluvium from mixed rock sources, and it consists of a variety of soil types with predominantly Columbia soils. Permeability is moderately rapid in this soil. Runoff is negligible or very slow, and the hazard of water erosion is slight. The hazard of wind erosion is considered low. The shrink-swell potential of this soil is low. The risk of corrosion is moderate for uncoated steel and low for concrete. This soil underlies a portion of the project area at and near the Grayson WWTP site.

Bolfar-Columbia complex. This very deep, poorly drained, nearly level soil is on floodplains. It formed in alluvium dominantly from granitic rock sources, and it consists of

primarily Bolfar and Columbia soils. Permeability is moderately slow in this soil. Runoff is negligible to low, and the hazard of water erosion is slight. The hazard of wind erosion is considered low. The shrink-swell potential of this soil is low. The risk of corrosion is high for uncoated steel and low for concrete. This soil underlies a small portion of the Grayson WWTP site.

The project area, along with the rest of Stanislaus County, is located in a seismically active region. The California Geological Survey does not list Westley or Grayson as areas included in the Alquist-Priolo Earthquake Fault Zones (California Geological Survey 2015). Stanislaus County is subject to seismic shaking from several known faults in the extreme eastern part of the County and in the Diablo Range (Coast Ranges) west of Interstate 5 (Stanislaus County 2016).

Potential seismic hazards include ground rupture (also called surface faulting), ground shaking, liquefaction, and lateral spreading. Liquefaction describes a phenomenon whereby a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress, usually earthquake shaking or other sudden change in stress condition, causing it to behave like a liquid.

## Environmental Impacts and Mitigation Measures

### a-1) Fault Rupture Hazards.

There are no active or potentially active faults located within or near the project area, nor are there Alquist-Priolo zones. The project would have no impact related to fault rupture.

### a-2) Seismic Ground Shaking.

The project area, along with the rest of the County, is subject to seismic shaking from fault features located to the east and west of the County. Improvements would incorporate engineering design features that would be in accordance with the 2013 California Building Code, adopted by the County and as amended, which contains design criteria that would enable structures to withstand projected seismic shaking. Impacts related to ground shaking are considered less than significant.

### a-3) Other Seismic Hazards.

Liquefaction generally occurs in areas in which water is close to the ground surface. As discussed in Section 3.9, Hydrology and Water Quality, the shallowest depth to groundwater measured in the project area is approximately 16 feet, at the Grayson WWTP site near the San Joaquin River. There has been no record of liquefaction occurring at this site; nevertheless, impacts related to liquefaction are considered potentially significant. Implementation of the following mitigation measure would identify the potential liquefaction hazard and provide recommendations in design and construction to reduce it, thereby reducing the potential impact to a level that would be less than significant.

Level of Significance: Potentially significant

#### Mitigation Measures:

GEO-1: A site-specific, design-level geotechnical study shall be completed for the project site before a grading permit is issued. The study shall include an evaluation of liquefaction potential in the construction area and identify appropriate means to minimize or avoid damage from liquefaction. In

addition, the study shall identify the presence of expansive soils in the construction area and recommend design and construction features to reduce the potential impact of these soils on project facilities. Geotechnical design recommendations included in the study shall be implemented during project design and construction.

Significance After Mitigation: Less than significant

a-4) Landslides.

The project area is in a topographically flat area, so no landslides would occur. The project would have no impact related to landslides.

b) Soil Erosion.

The soils in the project area have a low potential for erosion. Project construction activities would loosen soils within the construction area, leaving them exposed to potential water and wind erosion. Compliance with SJVAPCD Regulation VIII, which is discussed in Section 3.3, Air Quality, would reduce potential erosion impacts.

The project would also be required to comply with the provisions of the Construction General Permit, issued by the State Water Resources Control Board (SWRCB). The Construction General Permit is required for all projects that disturbed one acre of land or more. The permit requirements include preparation of a Storm Water Pollution Prevention Plan (SWPPP) by a Qualified SWPPP Developer to address potential water quality issues. The SWPPP includes implementation of Best Management Practices to avoid or minimize adverse water quality impacts. Best Management Practices fall within the categories of Temporary Soil Stabilization, Temporary Sediment Control, Wind Erosion Control, Tracking Control, Non-Storm Water Management, and Waste Management and Materials Pollution Control. Only Best Management Practices applicable to the project would become part of the SWPPP. Compliance with the Construction General Permit would minimize the amount of soil erosion that leaves the construction site. Soil erosion impacts would be less than significant.

c) Geologic Instability.

The soils underlying the sites where the facilities would be constructed have not been identified as inherently unstable or prone to failure. The project is not expected to change the stability of the local geology. Appropriate engineering design would avoid potential adverse effects. The project would have no impact on this issue.

d) Expansive Soils.

The Custom Soil Source Report indicates that soils in the area of the Grayson WWTP site have a low shrink-swell potential. The Capay clay, which underlies most of the remaining project area, has a high shrink-swell potential. Expansive soils can lead to damage of force mains and other facilities if not addressed. Implementation of Mitigation Measure GEO-1, described above, would identify expansive soil impacts and require implementation of recommended measures regarding these soils, thereby reducing impacts to a level that would be less than significant.

e) Adequacy of Soils for Wastewater Disposal.

The project would not use, and does not propose to install, any septic systems. The project would have no impact related to this issue.

### 3.7 GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			√	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			√	

## NARRATIVE DISCUSSION

### Environmental Setting

Greenhouse gases (GHGs) are gases that absorb and emit radiation within the thermal infrared range, trapping heat in the earth’s atmosphere. GHGs are both naturally occurring and are emitted by human activity. GHGs include carbon dioxide (CO<sub>2</sub>), the most abundant GHG, as well as methane, nitrous oxide and other gases. Major GHG sources in California include transportation, industrial, electric power, commercial and residential, and agriculture (ARB 2015). Increased atmospheric concentrations of GHGs are considered a main contributor to global climate change, which is a subject of concern for the State of California.

Potential impacts of global climate change in California include reduced Sierra Nevada snowpack, increased wildfire hazards, greater number of hot days with associated decreases in air quality, and potential decreases in agricultural production (Climate Action Team 2010). The Safety Element of the Stanislaus County General Plan identifies the following effects that would be experienced in the County as a result of climate change (Stanislaus County 2016):

- Increased health risks for vulnerable populations during extended heat waves.
- Changes in insect vector populations due to warmer temperatures, and associated increase in human risk.
- Increased drought potential due to less reliable snowfall.
- Increased flood risk due to the expected increase in winter rains in relation to winter snow at higher elevations.
- Reduced carryover storage in multi-purpose reservoirs as a result of the need to maintain a larger flood control capacity later into the year.
- Extended wildfire season.

Unlike the criteria air pollutants described in Section 3, Air Quality, GHGs have no “attainment” standards established by the federal or State government. In fact, GHGs are not generally thought of as traditional air pollutants because their impacts are global in nature, while air pollutants



mainly affect the general region of their release to the atmosphere (SJVAPCD 2015b). Nevertheless, the U.S. Environmental Protection Agency (EPA) has found that GHG emissions endanger both the public health and public welfare under Section 202(a) of the Clean Air Act due to their impacts associated with climate change (EPA 2009).

The State of California has implemented GHG emission reduction strategies through Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, which requires total statewide GHG emissions to reach 1990 levels by 2010, or an approximately 29% reduction from 2004 levels. In compliance with AB 32, the State adopted the Climate Change Scoping Plan in 2008, and updated the plan in 2014. Primary strategies addressed in the original Scoping Plan included new industrial and emission control technologies; alternative energy generation technologies; advanced energy conservation in lighting, heating, cooling and ventilation; fuels with reduced carbon content; hybrid and electric vehicles; and methods for improving vehicle mileage (ARB 2008). The 2014 update highlights California's progress toward meeting the 2020 GHG emission reduction goal of the original Scoping Plan, and it establishes a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050 (ARB 2014).

The SJVAPCD adopted a Climate Change Action Plan in 2008 and issued guidance for development project compliance with the plan in 2009. The guidance adopted an approach that relies on the use of Best Performance Standards to reduce GHG emissions. Projects implementing Best Performance Standards would be determined to have a less than cumulatively significant impact. For projects not implementing Best Performance Standards, demonstration of a 29% reduction in project-specific (i.e., operational) GHG emissions from business-as-usual conditions is required to determine that a project would have a less than cumulatively significant impact (SJVAPCD 2009).

Stanislaus County has no GHG reduction plan, alternatively known as a Climate Action Plan. However, the Safety Element of the County General Plan contains a section on Climate Adaptation. This section discusses the potential impacts climate change would have on County communities and facilities. Essential facilities and utilities, disadvantaged unincorporated communities, and industrial or commercial businesses were identified as particularly vulnerable to adverse climate change impacts. Safety Element policies and implementation measures relating to efforts to improve flood control and to reduce risks for future development, and efforts to improve the County's standard of living, comprise the County's adaptation strategy, along with measures in the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), which is discussed in Section 3.8, Hazards and Hazardous Materials. Neither the Westley CSD nor the HACS have GHG reduction plans.

## Environmental Impacts and Mitigation Measures

### a) Project GHG Emissions.

According to the results of the RCEM run for the project, CO<sub>2</sub> emissions for the construction period would be 312.7 tons. Construction GHG emissions are not substantial, as construction work would be limited to a short time period in the project area, and emissions from construction activities would cease once work is completed.

Once work is completed, the project would not generate any direct GHG emissions. Indirect GHG emissions may occur with the use of electricity for pumping in project operations. Currently, much of the electricity used in the state of California is provided by power plants burning fossil fuels, either coal or natural gas. Under California's Renewables Portfolio

Standard, electricity retailers must generate 33% of their electricity from renewable (i.e., non-fossil fuel) sources by 2020. Moreover, SB 350, enacted in 2015, requires that 50% of total generated electricity must come from renewable sources by 2030. Thus, an increasing proportion of electricity used by the project would come from renewable sources, which would lead to fewer indirect GHG emissions from electricity generation. Project impacts on GHG emissions are considered less than significant.

b) Consistency with GHG Reduction Plans.

As noted above, project operations would not generate direct GHG emissions, and indirect GHG emissions would be reduced over time. As a result, the project would be consistent with the GHG reduction objectives of the State’s Climate Change Scoping Plan and the SJVAPCD’s Climate Change Action Plan. Project impacts would be less than significant.

### 3.8 HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				√
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			√	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				√
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			√	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				√
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?			√	
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	√			

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

			√
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## NARRATIVE DISCUSSION

### Environmental Setting

This section focuses on hazards associated with hazardous materials, proximity to airports, and wildfires. Geologic and soil hazards are addressed in Section 3.6, Geology and Soils, and potential flooding hazards are addressed in Section 3.9, Hydrology and Water Quality.

Data on hazardous material sites are kept in the GeoTracker database, maintained by the State Water Resources Control Board (SWRCB), and in the EnviroStor database, maintained by the California Department of Toxic Substances Control (DTSC). Both GeoTracker and EnviroStor provide the names and addresses of hazardous material sites, along with their cleanup status. A search of EnviroStor indicated no record of active hazardous material sites (i.e., sites not cleaned up) within the project area (DTSC 2016). A search of GeoTracker indicated one cleanup project that was open in the project area – the Grischott Brothers leaking underground storage tank site at 8511 Highway 33 in Westley. There were no other open cleanup projects (SWRCB 2016).

Most of the project area is located on or near agricultural lands. Agricultural operations may involve the use of pesticides and herbicides that may have accumulated in the soil.

There are no public use airports in the project vicinity. Westley Airport, owned by Valley Crop Dusters, Inc., is a private airstrip located in northern Westley that is used mainly by aircraft involved with agricultural operations.

Stanislaus County generally experiences its wildfire season from May to October. Most of the fire-susceptible areas are located in the extreme western and eastern portions of the County. Areas of potential wildfires include the Diablo Range west of Interstate 5 and the Sierra Nevada foothills. The urban areas of the County are not normally susceptible to wildfires. There is a potential for smaller fires in and around the less developed areas where patches of vegetation are present (Stanislaus County 2010).

The Safety Element of the recently updated Stanislaus County General Plan identifies the significant safety hazards that may be encountered in the County, including the hazardous material and wildfire hazards discussed in this policies, and sets forth policies designed to reduce risk of these hazards to County residents and properties. As noted in Section 3.7, Greenhouse Gas Emissions, the County has adopted a MJHMP, which contains detailed information on the various types of safety hazards, including earthquakes, landslides, wildfires, flooding, and dam inundation. It also contains mitigation strategies to help reduce risk and prevent future losses from these hazards.

## Environmental Impacts and Mitigation Measures

### a) Hazardous Material Transport, Use, and Storage.

Project operations would not require the transport, use or storage of hazardous materials, outside of those already used by the Grayson WWTP in its operations. Usage of any such materials at the Westley WWTP would be reduced as a result of the project, as sewage treatment would occur at the Grayson WWTP site. No additional quantities of such materials would be required as a result of the project. The project would have no impact on this issue.

### b) Release of Hazardous Materials.

Construction activities may involve the use of hazardous materials such as fuels and solvents, and thus create a potential for hazardous material spills. Construction and maintenance vehicles would transport and use fuels in ordinary quantities. Fuel spills, if any occur, would be minimal and would not have significant adverse effects in the area. Contractors typically have absorbent materials at construction sites to clean up minor spills. Other substances used in the construction process would be stored in approved containers and used in relatively small quantities, in accordance with the manufacturers' recommendations and/or applicable regulations.

Project operations would not lead to the release of hazardous materials. Project impacts on this issue are considered less than significant.

### c) Hazardous Material Releases near Schools

The school nearest to the project is Grayson Charter School in Westley. As noted in b) above, project operations would not lead to the release of hazardous materials. The project would have no impact on this issue.

### d) Hazardous Materials Sites.

As noted above in Environmental Setting section of this chapter, a search of the GeoTracker database identified the Grischott Brothers leaking underground storage tank site in Westley. The project alignment would avoid this site, and the site is undergoing active cleanup. The EnviroStor database did not identify any hazardous material sites in the project area. A list of solid waste disposal sites identified by SWRCB with waste constituents above hazardous waste levels outside the waste management unit did not show any locations within the project area (CalEPA 2016a); likewise, a list by SWRCB containing sites under Cease and Desist Orders and Cleanup and Abatement Orders showed no locations (CalEPA 2016b). Project impacts would be less than significant.

### e) Airport Operations.

As previously noted, there are no public use airports in the vicinity of the project site. The project would have no impact on this issue.

### f) Airstrip Operations.

The proposed force main alignment would run parallel to the Westley Airport, a private operation. The project would not interfere with airstrip operations, nor would it place a permanent population near the airstrip. Since the project alignment would not be in the flight path of the airstrip, the project would not place maintenance workers in a potentially hazardous area. Project impacts would be less than significant.

g) Emergency Response and Evacuation.

The force main would be buried underground, while facilities constructed at the Grayson WWTP site would be located away from roads used by emergency vehicles or as evacuation routes. It is anticipated that directional drilling would be used to install the force main at the SR 33 crossing, which would cause no highway obstruction. In addition, installation of the force main at this crossing would require a Caltrans encroachment permit, which would establish conditions preventing significant disruptions to traffic flow.

The segment of the force main that would cross River Road on its way to the Grayson WWTP site could be installed by open trench. This could disrupt traffic flow on River Road and could hinder emergency vehicles in responding to calls. Implementation of the mitigation measure below would reduce the amount of disruption to potential emergency vehicle traffic, thereby reducing impacts to a level that would be less than significant.

Level of Significance: Potentially significant

Mitigation Measures:

HAZ-1: If open trenching will be used for installation of the force main at any road crossing, the contractor shall develop and implement a Traffic Control Plan prior to the start of trenching. The Traffic Control Plan shall include such items as traffic control requirements, resident notification of access closure, and daily access restoration. The contractor shall specify dates and times of road closures or restrictions, if any, and shall ensure that adequate access will be provided for emergency vehicles. The Traffic Control Plan shall be coordinated with the Stanislaus County Sheriff's Department and the West Stanislaus County Fire Protection District if construction will require road closures or lane restrictions.

Significance After Mitigation: Less than significant

h) Wildland Fire Hazards.

The project is located in a predominantly agricultural area, where the wildfire hazard is low. A portion of the project would be located in Westley, a developed area that also has a low wildfire hazard. The force main would be buried underground and would not be exposed to fire. The project would have no impact on this issue.

### 3.9 HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?			√	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of				√

pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems?

f) Otherwise substantially degrade water quality?

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of a levee or dam?

j) Inundation by seiche, tsunami, or mudflow?

		√	
		√	
			√
		√	
			√
		√	
		√	
			√

## NARRATIVE DISCUSSION

### Environmental Setting

The project area is within the watershed of the San Joaquin River, which is located adjacent to and east of Grayson. The San Joaquin River Basin covers 15,880 square miles, and includes as tributaries the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. The tributaries on the western side of the San Joaquin River near the project area include Del Puerto, Hospital, and Ingram Creeks (RWQCB 2015). The San Joaquin River is located adjacent to and east of Grayson, but no natural streams cross the project area itself. The proposed force main alignment would cross two irrigation ditches owned by WSID.

The project area is essentially flat. Elevation contour lines generally trend east, with the highest elevation along the project alignment at approximately 100 feet and lowest lying close to 40 feet. Based on this observation, the project area generally slopes and drains eastward towards the San Joaquin River. Runoff in the project area either percolates in the soils or flows to roadside ditches. Neither Westley nor Grayson have formal storm drainage collection systems.

The project area is located within the Delta Mendota Subbasin of the San Joaquin Valley Groundwater Basin. The Delta Mendota Subbasin encompasses the area west of the San Joaquin River from the San Joaquin/Stanislaus county line to south of the Merced/Fresno county line. The total storage capacity of the subbasin is estimated to be 30,400,000 acre-feet to a depth of 300 feet. Natural recharge is estimated to be 8,000 acre-feet, and applied water recharge is approximately 74,000 acre-feet. Annual urban and agricultural extractions are estimate to be 17,000 acre-feet and 491,000 acre-feet. Shallow, saline groundwater occurs within about 10 feet of the ground surface over a large portion of the subbasin. There are also localized areas of high iron, fluoride, nitrate, and boron in the subbasin (DWR 2006).

Depth to groundwater varies in the project area, although depths tend to be less variable east of SR 33. In the Westley area, groundwater may be as deep as 75 to 100 feet below ground surface. In Grayson and areas east of SR 33, depths to groundwater are not as great, ranging from approximately 38 feet below ground surface to as shallow as 16 feet below ground surface, near the San Joaquin River (DWR 2016).

The surface water quality in the valley and Delta regions is managed by the Central Valley Regional Water Quality Control Board (RWQCB) by means of The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan), revised in June 2015. The beneficial uses of surface waters in the region include municipal and domestic water supply; industrial service and process supply; agricultural irrigation; groundwater recharge; navigation; contact and non-contact recreation; commercial and sport fishing; migration of aquatic organisms; wildlife habitat; and habitat for rare, threatened, and endangered species. The SWRCB determined that the quality of these waters does not fully support all of the beneficial uses assigned to the water bodies in the project area. Water quality impacts are a result of tidal fluctuations; Sacramento River and San Joaquin River inflows; local agricultural, industrial, and municipal diversions and returns; and inadequate channel capacities (RWQCB 2015).

Most of the project alignment is located outside the 100-year floodplain, as determined by Flood Insurance Rate Maps issued by the Federal Emergency Management Agency (FEMA). The exception is the area in the vicinity of the Grayson WWTP. Levees are located along the west bank of the San Joaquin River north of Grayson and along the east bank of the river to the east FEMA 2008a, 2008b, 2008c). The portion of the project area near the Grayson WWTP is considered to be within the potential dam inundation areas of New Melones, San Luis, Exchequer, and Pine Flat dams (Stanislaus County 2010).

## Environmental Impacts and Mitigation Measures

### a, f) Surface Water Quality.

The project would not be constructed near any streams or bodies of water, so there would be no direct impact to surface waters. Wastewater conveyed by the project to the new facilities at the Grayson WWTP site would be subject to WDRs issued by the RWQCB to protect water quality. Project impacts would be less than significant.

### b) Groundwater Supplies.

The project would not demand additional water from any source, including local aquifers. The project would not add impervious surfaces, so existing groundwater recharge areas would not be affected. The project would have no impact on this issue.

### c, d) Drainage Patterns.

The force main portion of the project would be buried underground, so surface drainage patterns along the project alignment would not change. The project would involve new facilities at the Grayson WWTP, but the additional facilities would not substantially alter drainage patterns in the area such that it would cause soil erosion or flooding on adjacent properties. Project impacts on drainage would be less than significant.

e) Runoff.

As noted in b) above, the project would not add impervious surfaces, so no additional runoff would be generated. The project would have no impact on runoff.

g) Housing within Flood Hazard Area.

The project would not involve the construction of housing, so no housing would be placed within a 100-year floodplain. The project would have no impact on this issue

h) Alteration of Flood Flows.

The only portion of the project area within the 100-year floodplain would be the Grayson WWTP site. The project would involve construction of wastewater facilities at the Grayson WWTP site, but these facilities have low elevations and profiles. As such, they are not expected to impede or redirect flood flows should flooding occur. Project impacts on flood flows would be less than significant.

i) Dam and Levee Failure Hazards.

As noted above, the Grayson WWTP site is located within potential inundation zones of several dams were they to fail. The probability of failure of the dams is considered low, and the project would cause no change to the potential hazard within the project site. The project would not construct facilities that would expose people or structures used by people to potential dam failure.

Levees in the vicinity are located along the San Joaquin River. The project would not construct facilities that would expose people or structures used by people to potential levee failure. Project impacts related to dam and levee failure are considered less than significant.

j) Seiche, Tsunami and Mudflow Hazards.

The project is located in a topographically flat area away from large bodies of water. As such, the project would not experience seiche, tsunami or mudflow hazards. The project would have no impact related to this issue.

### 3.10 LAND USE AND PLANNING

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Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?				√



b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

		√	
			√

c) Conflict with any applicable habitat conservation plan or natural communities conservation plan?

## NARRATIVE DISCUSSION

### Environmental Setting

The community of Westley contains a mix of residential, commercial, and light industrial land uses. The western portion of the community includes residences and a charter school, with a commercial area along the west side of SR 33. The eastern part of Westley consists primarily of light industrial land uses along SR 33 and Kern Street. Between Westley and the Grayson WWTP, land use is predominantly agricultural, with rural residences scattered throughout the area. The community of Grayson is located southwest of the Grayson WWTP. It contains predominantly residential land uses, but also has commercial and recreational facilities.

Most of the project alignment is on land zoned by Stanislaus County as A-2-40, General Agriculture with a 40-acre minimum parcel. Within Westley, the project alignment passes through properties zoned M (Industrial) and A-2-10 (General Agriculture with a 10-acre minimum parcel).

### Environmental Impacts and Mitigation Measures

a) Division of Established Community.

A portion of the force main alignment would be located in Westley, but the main would be installed along its northern edge and be buried underground. Because of this, it would not divide an established community. No other communities in the area would be affected by project construction. The project would have no impact related to this issue.

b) Conflict with Applicable Plans, Policies and Regulations.

The project would not conflict with County policies and ordinances designed to protect agricultural lands. As discussed in Section 3.2, Agriculture and Forestry Resources, the project would not permanently convert agricultural lands to other uses. The project is designed to improve wastewater treatment in the Westley area, which in turn would protect local water and lands from adverse environmental effects resulting from existing WDR violations. Project impacts are considered less than significant.

c) Conflict with Habitat Conservation Plans.

As noted in Section 3.4, Biological Resources, there are no applicable habitat conservation plans or similar plans applicable to the project area. The project would have no impact on this issue.

### 3.11 MINERAL RESOURCES

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Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				√
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				√

### NARRATIVE DISCUSSION

#### Environmental Setting

The Stanislaus County General Plan does not indicate the presence of any mineral resource lands in the project vicinity (Stanislaus County 2016). No natural gas or oil fields are located in the project vicinity (DOGGR 2001).

#### Environmental Impacts and Mitigation Measures

a, b) Loss of Mineral Resource Availability.

Since there are no identified mineral resources areas in the project area, the project would have no effect on the availability of or access to locally designated or known mineral resources. The project would have no impact on mineral resources.

### 3.12 NOISE

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Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			√	
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			√	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				√

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

		√	
			√
			√

## NARRATIVE DISCUSSION

### Environmental Setting

Sound is defined as any pressure variation in air that the human ear can detect. To provide a manageable way to measure sound, the decibel (dB) scale was devised. The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. Within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by the A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives noise.

Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level ( $L_{eq}$ ), which corresponds to a steady-state, A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The  $L_{eq}$  shows very good correlation with community response to noise.

The project area is currently composed primarily of agricultural, residential, commercial and uses. The existing ambient noise environment in the project area is defined primarily by traffic on SR 33 and local surface roadways, by UPRR train operations, and by agricultural equipment usage. Noise-sensitive land uses along the proposed force main alignment are limited to residences in Westley, mainly around the Westley Farm Labor Housing Complex. These uses would be affected by noise from project construction activities.

Stanislaus County Code Chapter 10.46 establishes noise standards applicable to projects. Exterior noise levels in residential zones shall not exceed 50 dB maximum noise level ( $L_{max}$ ) during the daytime (7:00 am – 9:59 pm) and 45 dB  $L_{max}$  during the nighttime (10:00 pm – 6:59 am). For uses deemed "Noise Sensitive," such as schools, hospitals and churches, exterior noise levels during the daytime shall be no greater than 45 dB  $L_{max}$ . Also, construction equipment shall not be operated so as to cause at or beyond the property line of any property on which a dwelling unit is located an average sound level greater than 75 dB between the hours of 7:00 pm and 7:00 am.

## Environmental Impacts and Mitigation Measures

### a) Exposure to Noise Exceeding Local Standards.

Project construction activities would likely expose some residents near the project area to short-term noise impacts. Grading, earthmoving and trenching would be the main construction activities, so the construction equipment likely to be used would include dozers, excavators and backhoes. Grading and earthmoving activities would be confined to the Grayson WWTP site, which is a mile away from the nearest residences. At that distance, construction noise from the Grayson WWTP site is unlikely to reach residences at noticeably elevated levels.

Trenching would occur along most of the force main alignment. This activity would involve backhoes that could generate noise that reaches residences around Westley and a part of Grayson. Backhoes generate a noise level of approximately 80 dBA at a reference distance of 50 feet (FHWA 2006). Noise essentially decreases by 6 dBA with every doubling of distance from a source (Harris 1991). For example, the noise from a backhoe would be 74 dBA at 100 feet and 68 dBA at 200 feet. The nearest residences to the project alignment are approximately 1,000 feet away. At this distance, the noise level would be less than 56 dBA, which is below the allowable County standard for construction noise at residential properties.

Construction noise is a short-term occurrence that does not result in significant or long-term effects, provided that sleep interruption is not involved. Construction activities are anticipated to occur during the hours of 7:00 am to 7:00 pm, in accordance with the County Code. Impacts related to noise exposure are considered less than significant.

### b) Groundborne Vibrations.

Groundborne vibration is not a common environmental problem. It is typically associated with transportation facilities, although it is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving and operating heavy earth-moving equipment.

The project likely would use some earthmoving equipment during construction. Such equipment would most likely be used at the Grayson WWTP site, and the nearest sensitive receptor is one mile away. At that distance, groundborne vibrations are unlikely to reach this receptor. Project impacts would be less than significant.

### c) Permanent Increase in Ambient Noise.

In general, project operations would not generate any noise. The main potential source of permanent ambient would be the proposed influent pump at the Westley WWTP site. It is expected that the influent pump would be located inside the existing lift station building. The building is expected to muffle sound from pump operations. The project would have no permanent impact on ambient noise levels.

### d) Temporary or Periodic Increase in Ambient Noise.

The project would generate a temporary increase in ambient noise from construction activities. As described in a) above, construction noise levels at the closest residences would not exceed County noise standards. Project impacts would be less than significant.

e, f) Exposure to Airport/Airstrip Noise.

As noted in Section 3.8, Hazards and Hazardous Materials, the only aircraft facility in the project area is Westley Airport, a private airstrip. The project would not place residents or employees in the vicinity of this airstrip. The project would have no impact on this issue.

### 3.13 POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			√	
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				√
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				√

## NARRATIVE DISCUSSION

### Environmental Setting

As of January 1, 2017, the population of Stanislaus County was estimated at 548,057, of which 114,891 resided in the unincorporated area (California Department of Finance 2017). Stanislaus County had an estimated 180,777 housing units in 2017, of which 36,327 were located in the unincorporated area. Single-family detached units (typical houses) accounted for approximately 74.6% of total housing units in the County, but approximately 81.5% of housing units in the unincorporated County (California Department of Finance 2017).

According to the 2010 U.S. Census, the community of Westley had a population of 603. There were 157 housing units in Westley, of which 149 were occupied (U.S. Census Bureau 2010a). The community of Grayson had a population of 952. There were 280 housing units in Grayson, of which 250 were occupied (U.S. Census Bureau 2010b).

Housing in Westley includes the Westley Farm Labor Housing Complex, which is managed by the HACS. As noted in Chapter 1.0, Introduction, the complex consists of 86 migrant units that are occupied from May through October, and 85 farm labor units and 20 public housing units that are occupied year round.

## Environmental Impacts and Mitigation Measures

### a) Population Growth Inducement.

The purpose of this project is the improvement of wastewater treatment services. It would not involve the construction of residences or commercial or industrial buildings that could induce population growth in the area.

It is conceivable that the project could encourage further development in the community of Westley, as a more reliable wastewater service would be provided for any future development. Given the limited capacity of the proposed new facilities, the project would allow for at most limited development of Westley, and that development would likely be confined to the existing developed area. Project impacts are considered less than significant.

### b, c) Displacement of Housing and People.

There is no housing along the project alignment or at the Grayson WWTP site, so the project would not displace existing housing or people. The project would have no impact on this issue.

## 3.14 PUBLIC SERVICES

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
--------------------------------	--	------------------------------	-----------

a) Fire protection?

b) Police protection?

c) Schools?

d) Parks?

e) Other public facilities?

			√
			√
			√
			√
			√

## NARRATIVE DISCUSSION

### Environmental Setting

Fire protection services in the project area are provided by the West Stanislaus County Fire Protection District. The District maintains the Westley Volunteer Fire Department station at the corner of Kern and E Streets in Westley. All public fire protection agencies in Stanislaus County operate under a master mutual aid agreement, which means that the resources of other fire departments would be available if the District needs assistance (West Stanislaus County Fire Protection District 2017).

Law enforcement services for the project site are provided by the Stanislaus County Sheriff's Department. The main Sheriff's station is located at 250 East Hackett Road in Modesto. (Stanislaus County Sheriff's Department 2017).

School services from kindergarten to 12<sup>th</sup> grade are provided by the Patterson Joint Unified School District. The Grayson Charter School, located on 301 Howard Road in Westley, provides school services from kindergarten to 5<sup>th</sup> grade. According to the California Department of Education's DataQuest database, there were 274 students enrolled at Grayson Charter School in the 2014-2015 school year (California Department of Education 2016).

Parks and recreational services in the vicinity are provided by the Stanislaus County Parks and Recreation Department. Several parks and recreational facilities are located in and near Grayson, including the United Community Center and Park on Laird and Mary Streets, the Leroy Fitzsimmons Memorial Park on Amelia and Stakes Streets, and Laird Park on Grayson Road approximately two miles east of Grayson on the San Joaquin River. There are no County parks located in Westley (Stanislaus County 2017).

## Environmental Impacts and Mitigation Measures

### a) Fire Protection.

The project involves wastewater treatment improvements. As such, it would not create additional demand for fire protection services. No new or expanded fire protection facilities that could have environmental impacts would be required. The project would have no impact on this issue.

### b) Police Protection.

The project would not create additional demand for police protection services. No new or expanded police protection facilities that could have environmental impacts would be required. The project would have no impact on this issue.

### c) Schools.

The project would not create additional demand for school services. No new or expanded school facilities that could have environmental impacts would be required. The project would have no impact on this issue.

### d, e) Parks and Other Public Facilities.

The project would not create additional demand for parks or other public facilities. No new or expanded facilities that could have environmental impacts would be required. The project would have no impact on this issue.

## 3.15 RECREATION

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the				√

facility would occur or be accelerated?

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

			√

## NARRATIVE DISCUSSION

### Environmental Setting

The Stanislaus County Parks and Recreation Department manages parks and recreational centers in the unincorporated County. As noted in Section 3.14, Public Services, County parks and recreational facilities are located in and near Grayson. There are no County recreational facilities in Westley, but a playground is located within the Westley Farm Labor Housing Complex.

The San Joaquin River, adjacent to and east of Grayson, provides opportunities for activities such as fishing, boating and kayaking. The San Joaquin River National Wildlife Refuge, managed by the U.S. Fish and Wildlife Service, is located approximately 2 miles north of Grayson. The refuge offers recreational activities such as wildlife viewing and photography.

### Environmental Impacts and Mitigation Measures

a, b) Recreational Facilities.

The project involves wastewater treatment improvements. As such, it would not create additional demand for recreational facilities. No new or expanded facilities that could have environmental impacts would be required. The project would have no impact on this issue.

## 3.16 TRANSPORTATION/TRAFFIC

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				√
b) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				√
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that				√



results in substantial safety risks?

d) Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

e) Result in inadequate emergency access?

f) Conflict with adopted policies, plans or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

			√
	√		
			√

## NARRATIVE DISCUSSION

### Environmental Setting

The main highway in the project area is SR 33, a two-lane, north-south highway through Westley. SR 33 traverses the western portion of the San Joaquin Valley, eventually ending at Ventura in the south. Grayson Road is a two-lane County road that connects Westley with Grayson. West of SR 33, Grayson Road becomes Howard Road, a two-lane County road that connects Westley with Interstate 5 to the west. Other roads in the project area, both public and private, provide access to residences and farms in the project area. The communities of Westley and Grayson each have a street system that provides access to residences and businesses. The Westley Farm Labor Housing Complex has an internal street system.

Public transit service is provided to Westley and Grayson through Stanislaus Regional Transit (StaRT). StaRT Route 40, which operates between Modesto and Patterson, makes regularly scheduled stops at both communities. There are no designated bikeways in the project area, other than a bike path in Westley from Grayson Charter School to Kern Street (StanCOG 2013). There are sidewalks in the Westley Farm Labor Housing Complex and in Grayson, but neither Westley nor Grayson has an extensive network of sidewalks.

The UPRR operates railroad tracks east of Westley. Trains on these tracks carry freight; no passenger rail service is provided. The Westley Airport is a privately owned facility used primarily for agricultural operations; no passenger service is provided.

### Environmental Impacts and Mitigation Measures

a) Conflict with Transportation Plans, Ordinances and Policies.

The project involves wastewater treatment improvements. It would generate some traffic during construction activities but would generate no traffic upon completion of construction work, other than occasional visits by maintenance vehicles. The project would have no impact on traffic conditions on roads in the vicinity; as such, it would have no impact on applicable plans, ordinances and policies related to traffic.

b) Conflict with Congestion Management Program.

In 2010, the Stanislaus Council of Governments (StanCOG) adopted the Congestion Management Process in accordance with State law. The Congestion Management Process is designed to improve multimodal mobility on the defined County network of roads and to avoid the creation of deficiencies that lead to traffic congestion (StanCOG 2010). Since the project would not generate

traffic, it would have no impact on activities designed to achieve the objectives of the Congestion Management Process. The project would have no impact on this issue.

c) Air Traffic Patterns.

The project would not generate air passenger demand. As discussed in in Section 3.8, Hazards and Hazardous Materials, the project would not interfere with operations at Westley Airport. The project would have no impact on this issue.

d) Traffic Hazards.

The project would not alter or obstruct the existing road system in the project vicinity. Existing road conditions would not change. The project would have no impact on this issue.

e) Emergency Access.

As discussed in Section 3.8, Hazards and Hazardous Materials, directional drilling would be used to install the force main at the SR 33 crossing, so no disruption of traffic flow or emergency access is anticipated. The crossing at River Road may employ open trenching, which would disrupt traffic flow on that roadway. Mitigation Measure HAZ-1, described in Section 3.8, Hazards and Hazardous Materials, would require preparation of a Traffic Hazard Plan for any road crossing at which open trenching is employed. Implementation of this mitigation measure would reduce impacts to a level that would be less than significant.

f) Conflicts with Non-vehicular Transportation Plans.

The project would not affect StaRT public transit routes in the project area, nor would it affect existing bicycle paths and sidewalks. The project would be buried underground, so it would not interfere with the installation of bicycle or pedestrian facilities in the future.

In 2013, StanCOG adopted a Non-Motorized Transportation Master Plan that is designed to further the development of bicycle and pedestrian facilities in Stanislaus County and its incorporated cities (StanCOG 2013). The project is not expected to interfere with the implementation of any future projects in the project area. The project would have no impact on this issue.

### 3.17 TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or

		√	
		√	

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of

Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

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## NARRATIVE DISCUSSION

### Environmental Setting

In 2015, the California Legislature enacted AB 52, which focuses on consultation with Native American tribes on land use issues potentially affecting the tribes. The intent of this consultation is to avoid or mitigate potential impacts on “tribal cultural resources,” which are defined as “sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe.” More specifically, Public Resources Code Section 21074 defines tribal cultural resources as:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are included or determined to be eligible for inclusion in the California Register of Historical Resources, or included in a local register of historical resources; or
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1 [i.e., eligible for inclusion in the California Register of Historical Resources].

Under AB 52, when a tribe requests consultation with a CEQA lead agency on projects within its traditionally and culturally affiliated geographical area, the lead agency must provide the tribe with notice of a proposed project within 14 days of a project application being deemed complete or when the lead agency decides to undertake the project if it is the agency’s own project. The tribe has up to 30 days to respond to the notice and request consultation; if consultation is requested, then the local agency has up to 30 days to initiate consultation.

In 2016, the Governor’s Office of Planning and Research updated Appendix G of the CEQA Guidelines to include sample questions specifically addressing tribal cultural resources. These questions have been incorporated within this IS/MND.

As previously noted, the project area is located within lands claimed by the Northern Valley Yokuts at the time of initial contact with European Americans. Section 3.5, Cultural Resources, discusses the Yokuts in more detail.

### Environmental Impacts and Mitigation Measures

a, b) Tribal Cultural Resources.

As noted in Section 3.5, Cultural Resources, no archaeological resources associated with Native American tribes are known to exist within the project area. As part of the cultural resource study for the project, available in Appendix C of this IS/MND, the cultural resource consultant contacted the Native American Heritage Commission for a records search of sacred lands and a list of tribes that should be contacted about the project. The Commission indicated that no sacred

lands were recorded for the project area. The Commission advised that representatives of four tribes be contacted regarding the project. Letters requesting more information were sent to representatives of these tribes. No responses were received at the time the cultural resource study was prepared.

Based on the information from the archaeological survey and the lack of response from tribal representatives, the project is considered unlikely to affect tribal cultural resources as defined by AB 52. Project impacts would be less than significant. The Westley CSD would comply with the consultation provisions of AB 52 should a tribe whose traditionally and culturally affiliated geographical area includes the project site request consultation.

### 3.18 UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			√	
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			√	
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				√
d) Are sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				√
e) Has the wastewater treatment provider which serves or may serve the project determined that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			√	
f) Is the project served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				√
g) Comply with federal, state and local statutes and regulations related to solid waste?				√

## NARRATIVE DISCUSSION

### Environmental Setting

As described in Chapter 2.0, Project Description, the HACS operates the Westley WWTP. Wastewater collection and disposal services for the community of Westley are provided by the

Westley CSD, which currently serves 23 residential connections, 15 commercial connections, and one school connection. The HACS is responsible for wastewater collection services in the Westley Farm Labor Housing Complex. The Grayson CSD provides wastewater collection and treatment services for the community of Grayson, and the CSD operates the Grayson WWTP northeast of the community. Areas outside Westley and Grayson are served by individual septic systems.

The Westley CSD provides potable water service to Westley residents and businesses through water purchases from the HACS, which operates two groundwater wells in the area (Stanislaus LAFCO 2014). Water in the community of Grayson is provided by the City of Modesto. Areas outside these communities obtain potable water from individual groundwater wells. Irrigation water in the project area is provided by WSID, which owns two irrigation ditches beneath which the proposed force main alignment would cross.

Stormwater drainage in Westley is provided by rockwells, which are deep holes lined with rocks that collect stormwater and allow it to seep into the ground. There are no stormwater collection lines or detention ponds in Westley, although the Westley Farm Labor Housing Complex has curbs and gutters. The community of Grayson relies mainly on roadside percolation, although newer development is served by curb and gutter, storm drain pipes, and a detention basin that pumps to the San Joaquin River bottom (Stanislaus County 2004). Stormwater outside these communities either percolates into the ground or is collected by roadside ditches that discharge into streams.

Solid waste generated in Westley and Grayson is collected by Bertolotti Disposal Company. Collected solid waste is taken to the Bertolotti Transfer Station in Ceres. The County operates the Fink Road Sanitary Landfill in Crows Landing. The landfill has adequate capacity to the year 2023 (CalRecycle 2016).

## Environmental Impacts and Mitigation Measures

### a, b, e) Wastewater Systems.

The project is intended to improve existing wastewater services for the community of Westley by correcting existing deficiencies associated with current operations. The project would have a beneficial impact on wastewater services. Project impacts are considered less than significant.

### b, d) Water Systems and Supply.

The project involves wastewater treatment improvements. As such, it would not generate a demand for water services and would have no impact on water supplies. The project would cross irrigation ditches operated by the WSID. As noted in Chapter 2.0, Project Description, the project would require approval from the District prior to construction work. The project would have no impact on water systems.

### c) Stormwater Systems.

The project would not generate a demand for stormwater services. The project would have no impact on this issue.

### f, g) Solid Waste Services.

The project would not generate a demand for solid waste collection services or landfill capacity. The project would have no impact on this issue.

### 3.19 MANDATORY FINDINGS OF SIGNIFICANCE

Potentially Significant Impact      Less Than Significant With Mitigation Incorporated      Less Than Significant Impact      No Impact

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

b) Does the project have impacts that are individually limited, but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

c) Does the project have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly?

	√		
		√	
			√

### NARRATIVE DISCUSSION

#### a) Findings on Biological and Cultural Resources.

The project’s potential biological and cultural resource impacts are described in Sections 3.4 and 3.5, respectively. Potentially significant environmental effects were identified in these issue areas, but all of the potentially significant effects would be reduced to a level that would be less than significant with mitigation measures that would be incorporated into the project.

#### b) Findings on Individually Limited but Cumulatively Considerable Impacts.

As described in this Initial Study, the potential environmental effects of the project would either be less than significant, or the project would have no impact at all, when compared to the baseline. Where the project involves potentially significant effects, proposed mitigation measures and compliance with required permits and applicable regulations would reduce these effects to levels that are less than significant. The potential environmental effects identified in this Initial Study have been considered in conjunction with each other as to their potential to generate other potentially significant effects. The various potential environmental effects of the project would not combine to generate any potentially significant cumulative effects. There are no other known, similar projects with which the project might combine to produce adverse cumulative impacts. The cumulative impacts of the project are considered less than significant.

c) Findings on Adverse Effects on Human Beings.

Potential adverse effects on human beings were discussed in Section 3.6, Geology and Soils (seismic hazards); Section 3.8, Hazards and Hazardous Materials; Section 3.9, Hydrology and Water Quality (flooding); and Section 3.16, Transportation (roadway design). No potential adverse effects on human beings were identified in these sections. The project would have a beneficial effect for people in the vicinity, as it would correct deficiencies in existing wastewater services in Westley that could have adverse environmental effects if not corrected.

## 4.0 REFERENCES

### 4.1 DOCUMENT PREPARERS

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This IS/MND was prepared by BaseCamp Environmental for use by and under the supervision of the Westley CSD. The following persons were involved in preparation of the IS/MND:

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#### 4.4 PERSONS CONSULTED

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Theresa Haywood, San Joaquin Valley Air Pollution Control District

Victorio Tostado, Grayson Community Services District

## 5.0 NOTES RELATED TO EVALUATION OF ENVIRONMENTAL IMPACTS

- 1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- 4) “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analyses,” as described in (5) below, may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
  - a) Earlier Analysis Used. Identify and state where they are available for review.
  - b) Impacts Adequately Addressed: Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - c) Mitigation Measures: For effects that are “Less than Significant with Mitigation Measures Incorporated,” describe the mitigation measures, which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
  - 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances).

Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) The checklist in CEQA Guidelines Appendix G is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify:
  - a) the significance criteria or threshold, if any, used to evaluate each question; and
  - b) the mitigation measure identified, if any, to reduce the impact to less than significance.

APPENDIX A  
AIR QUALITY

## Welcome to the Road Construction Emissions Model, Version 7.1.5.1 User Instructions

This spreadsheet system contains the following individual worksheets:

1. This worksheet of User Instructions
2. Emission Estimates
3. Data Entry
4. EMFAC2011
5. OFFROAD Convert
6. OFFROAD HP & LF
7. OFFROAD EF



### Changes from previous version of Road Construction Emissions Model

#### (Version 7.1.4 to 7.1.5) (updated by SMAQMD 12/11/13 with assistance from ENVIRON Corporation)

- 1) Grubbing and Land Clearing Phase calculation of active months in 2007, 2017, 2019 fixed.
- 2) Soil Hauling Emissions calculation to select override if it exists for round trips/day.
- 3) Worker Commute Emissions calculation of starting and hot soak emissions; drainage phase PM<sub>10</sub> emission rate.
- 4) Water Truck Emissions calculation to select number of months for Grubbing and Land Clearing Phase; maximum acreage/day after 2025.

#### (Version 6.3.2 to Version 7.1.0, 7.1.1, 7.1.2, 7.1.3 & 7.1.4) (updated by SMAQMD 8/2/13)

- 1) EMFAC2011 emission factors added (previous EMFAC versions dropped).
- 2) OFFROAD2011 emission factors added (and fixed error).
- 3) OFFROAD2007 for categories not in OFFROAD2011 (and fixed error)
- 4) Project length changed to include calendar years 2009 through 2025.
- 5) Average Offroad HP by Equipment Type calculation updated and corrected
- 6) Load Factor Adjustment deactivated (default load factors already incorporated in ARB's calculation of emission factors)
- 7) Crawler Tractor equipment added to model
- 8) Air Compressors ROG & Default Excavators calculation on Data Entry sheet corrected.
- 9) Default equipment list updated
- 10) Corrections to Worker Commute Emissions calculations

The Emission Estimates worksheet calculates a project's emissions in pounds per day (and kilograms per day) by project phase and tons (and megagrams) over the entire construction period.

The worksheet can be used to estimate emissions for both vehicle exhaust and fugitive dust. The methodology used to estimate fugitive dust emissions is a simplified methodology involving estimates of the maximum area (acreage) of land disturbed daily. Detailed fugitive dust emission estimates associated with individual materials handling operations and/or activity/vehicle types cannot be conducted with this version of the model.

The Emission Estimates worksheet cannot be modified directly, it is a protected worksheet. It can only be modified indirectly by entering information for the project in selected areas of the Data Entry worksheet.

The last four of these worksheets - EMFAC2011, OFFROAD Convert, OFFROAD HP & LP, and OFFROAD EF - cannot be modified by the user. They are protected worksheets.

Even though all or portions of several worksheets are protected, the individual formulas used in the calculations can be seen by the user.

The Data Entry worksheet includes several areas that can be modified by the user.

User instructions in the Data Entry worksheet are highlighted in red.

On the Data Entry worksheet, the user has two options for entering project data: required data and optional data. Required data is entered in the data input section (yellow cells). That required data is then used by the worksheet to calculate default values for the project.

The user can override the default values (blue cells) calculated for a project and is encouraged to do so if project specific information is available. Due to the difficulty in developing reliable default values for road construction projects,

the user is encouraged to enter as much site specific information as is available for the project being analyzed.

The Data Entry Worksheet also includes a button that allows the user to clear previously entered data. This button is found just at the top of and to the right of the data entry portion of the worksheet.

When projects are discontinuous, the user must make adjustments to the spreadsheet manually, since the program cannot be setup to anticipate unexpected project delays.

#VALUE! <- This error message may occur during use of the spreadsheets. This occurs whenever the user enters a non numeric value, including a space character, into a cell that is used to calculate a numeric value. Consequently, to erase values entered into the spreadsheets, use the delete key instead of the space bar!

Note: Information in this worksheet is based on conversations with knowledgeable individuals at the Sacramento Metropolitan Air Quality Management District, the California Department of Transportation, the California Air Resources Board, the U.S. EPA, and private industry involved in road construction.

Also, the 26th edition of Walker's Building Estimator's Reference Book (1999) was used in the development of this spreadsheet.

This spreadsheet was prepared by Jones & Stokes and TIAX LLC with the financial support and direction of the Sacramento Metropolitan Air Quality Management District.



<http://www.airquality.org>

Karen Huss



an ICF International Company

<http://www.jonesandstokes.com>

Shannon Hatcher



<http://www.tetrattech.com/>

Karen Law

Road Construction Emissions Model, Version 7.1.5.1

Emission Estimates for -> Westley Grayson Sewer											
Project Phases (English Units)	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)	CO2 (lbs/day)	
Grubbing/Land Clearing	3.1	17.9	20.9	1.4	1.1	0.3	1.0	0.9	0.1	3,087.6	
Grading/Excavation	8.7	52.5	79.3	4.2	3.9	0.3	3.6	3.5	0.1	10,503.2	
Drainage/Utilities/Sub-Grade	7.6	44.2	63.5	3.7	3.4	0.3	3.1	3.1	0.1	8,438.0	
Paving	4.1	24.7	27.6	1.8	1.8	-	1.6	1.6	-	4,210.7	
<b>Maximum (pounds/day)</b>	<b>8.7</b>	<b>52.5</b>	<b>79.3</b>	<b>4.2</b>	<b>3.9</b>	<b>0.3</b>	<b>3.6</b>	<b>3.5</b>	<b>0.1</b>	<b>10,503.2</b>	
<b>Total (tons/construction project)</b>	<b>0.5</b>	<b>2.8</b>	<b>4.0</b>	<b>0.2</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.2</b>	<b>0.0</b>	<b>534.3</b>	

Notes: Project Start Year -> 2018  
 Project Length (months) -> 6  
 Total Project Area (acres) -> 4  
 Maximum Area Disturbed/Day (acres) -> 0  
 Total Soil Imported/Exported (yd<sup>3</sup>/day)-> 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 H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Westley Grayson Sewer											
Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)	
Grubbing/Land Clearing	1.4	8.1	9.5	0.6	0.5	0.1	0.5	0.4	0.0	1,403.5	
Grading/Excavation	3.9	23.8	36.1	1.9	1.8	0.1	1.6	1.6	0.0	4,774.2	
Drainage/Utilities/Sub-Grade	3.5	20.1	28.9	1.7	1.5	0.1	1.4	1.4	0.0	3,835.5	
Paving	1.9	11.2	12.5	0.8	0.8	-	0.7	0.7	-	1,914.0	
<b>Maximum (kilograms/day)</b>	<b>3.9</b>	<b>23.8</b>	<b>36.1</b>	<b>1.9</b>	<b>1.8</b>	<b>0.1</b>	<b>1.6</b>	<b>1.6</b>	<b>0.0</b>	<b>4,774.2</b>	
<b>Total (megagrams/construction project)</b>	<b>0.4</b>	<b>2.5</b>	<b>3.6</b>	<b>0.2</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.2</b>	<b>0.0</b>	<b>484.6</b>	

Notes: Project Start Year -> 2018  
 Project Length (months) -> 6  
 Total Project Area (hectares) -> 2  
 Maximum Area Disturbed/Day (hectares) -> 0  
 Total Soil Imported/Exported (meters<sup>3</sup>/day)-> 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 H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.



## Road Construction Emissions Model Data Entry Worksheet

Note: Required data input sections have a yellow background.

Optional data input sections have a blue background. Only areas with a

yellow or blue background can be modified. Program defaults have a white background.

The user is required to enter information in cells C10 through C25.

### Input Type

Project Name	Westley Grayson Sewer
Construction Start Year	2018
Project Type	1
Project Construction Time	6.00
Predominant Soil/Site Type: Enter 1, 2, or 3	1
Project Length	3.25
Total Project Area	3.95
Maximum Area Disturbed/Day	0.03
Water Trucks Used?	1
Soil Imported	0.00
Soil Exported	0.00
Average Truck Capacity	20

The remaining sections of this sheet contain areas that can be modified by the user, although those

Note: The program's estimates of construction period phase length can be overridden in cells C34 through

Construction Periods	User Override of Construction Months
Grubbing/Land Clearing	
Grading/Excavation	
Drainage/Utilities/Sub-Grade	
Paving	
<b>Totals</b>	0.00

**NOTE: soil hauling emissions are included in the Grading/Excavation Construction Per**

Hauling emission default values can be overridden in cells C45 through C46.

<b>Soil Hauling Emissions</b>		User Override of Soil Hauling Defaults
<b>User Input</b>		
Miles/round trip		
Round trips/day		
Vehicle miles traveled/day (calculated)		
<b>Hauling Emissions</b>		<b>ROG</b>
Emission rate (grams/mile)		0.15
Emission rate (grams/trip)		0.00
Pounds per day		0.00
Tons per construction period		0.00

Worker commute default values can be overridden in cells C60 through C65.

<b>Worker Commute Emissions</b>		User Override of Worker Commute Default Values
Miles/ one-way trip		
One-way trips/day		
No. of employees: Grubbing/Land Clearing		
No. of employees: Grading/Excavation		
No. of employees: Drainage/Utilities/Sub-Grade		
No. of employees: Paving		
		<b>ROG</b>
Emission rate - Grubbing/Land Clearing (grams/mile)		0.120
Emission rate - Grading/Excavation (grams/mile)		0.120
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)		0.120
Emission rate - Paving (grams/mile)		0.120
Emission rate - Grubbing/Land Clearing (grams/trip)		0.415
Emission rate - Grading/Excavation (grams/trip)		0.415
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)		0.415
Emission rate - Paving (grams/trip)		0.415
Pounds per day - Grubbing/Land Clearing		0.140
Tons per const. Period - Grub/Land Clear		0.001
Pounds per day - Grading/Excavation		0.295
Tons per const. Period - Grading/Excavation		0.008
Pounds per day - Drainage/Utilities/Sub-Grade		0.264
Tons per const. Period - Drain/Util/Sub-Grade		0.006
Pounds per day - Paving		0.217
Tons per const. Period - Paving		0.002
tons per construction period		0.017

Water truck default values can be overridden in cells C91 through C93 and E91 through E93.

<b>Water Truck Emissions</b>	User Override of Default # Water Trucks
Grubbing/Land Clearing - Exhaust	
Grading/Excavation - Exhaust	
Drainage/Utilities/Subgrade	
<b>ROG</b>	
Emission rate - Grubbing/Land Clearing (grams/mile)	0.15
Emission rate - Grading/Excavation (grams/mile)	0.15
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.15
Pounds per day - Grubbing/Land Clearing	0.01
Tons per const. Period - Grub/Land Clear	0.00
Pound per day - Grading/Excavation	0.01
Tons per const. Period - Grading/Excavation	0.00
Pound per day - Drainage/Utilities/Subgrade	0.01
Tons per const. Period - Drainage/Utilities/Subgrade	0.00

Fugitive dust default values can be overridden in cells C110 through C112.

<b>Fugitive Dust</b>	User Override of Max Acreage Disturbed/Day
Fugitive Dust - Grubbing/Land Clearing	
Fugitive Dust - Grading/Excavation	
Fugitive Dust - Drainage/Utilities/Subgrade	

## Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles <i>Program-estimate</i>
	1
	1
	7
	Grubbing/Land Clearing Grubbing/Land Clearing

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles <i>Program-estimate</i>
	0
	1
	3
	1
	2
	1
	2
	7
	2
	Grading/Excavation Grading

<b>Drainage/Utilities/Subgrade</b> Override of Default Number of Vehicles	Default Number of Vehicles <i>Program-estimate</i>
	1
	1
	1
	1
	1
	1
	2
	7
	2
	Drainage Drainage



Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 ar

Equipment	
Aerial Lifts	
Air Compressors	
Bore/Drill Rigs	
Cement and Mortar Mixers	
Concrete/Industrial Saws	
Cranes	
Crawler Tractors	
Crushing/Proc. Equipment	
Excavators	
Forklifts	
Generator Sets	
Graders	
Off-Highway Tractors	
Off-Highway Trucks	
Other Construction Equipment	
Other General Industrial Equipment	
Other Material Handling Equipment	
Pavers	
Paving Equipment	
Plate Compactors	
Pressure Washers	
Pumps	
Rollers	
Rough Terrain Forklifts	
Rubber Tired Dozers	
Rubber Tired Loaders	
Scrapers	
Signal Boards	
Skid Steer Loaders	
Surfacing Equipment	
Sweepers/Scrubbers	
Tractors/Loaders/Backhoes	
Trenchers	
Welders	





Enter a Year between 2009 and 2025  
(inclusive)

- 1 New Road Construction
- 2 Road Widening
- 3 Bridge/Overpass Construction
- months
- 1. Sand Gravel
- 2. Weathered Rock-Earth
- 3. Blasted Rock
- miles
- acres
- acres
- 1. Yes
- 2. No
- yd<sup>3</sup>/day
- yd<sup>3</sup>/day
- yd<sup>3</sup> (assume 20 if unknown)

To begin a new prc  
previously entered  
opted not to dis.

r, although those modifications are optional.

cells C34 through C37.

Program Calculated Months	2005	%	2006
0.60	0.00	0.00	0.00
2.40	0.00	0.00	0.00
2.10	0.00	0.00	0.00
0.90	0.00	0.00	0.00
6.00			

Construction Period Phase, therefore the Construction Period for Grading/Excavation cannot be zero if hauling is part of the project.

Default Values

30
0
0

	<b>NOx</b>	<b>CO</b>	<b>PM10</b>	<b>PM2.5</b>
	6.66	0.67	0.16	0.09
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00

Default Values

20
2
11
24
21
18

	<b>NOx</b>	<b>CO</b>	<b>PM10</b>	<b>PM2.5</b>
	0.154	1.399	0.047	0.020
	0.154	1.399	0.047	0.020
	0.154	1.399	0.047	0.020
	0.154	1.399	0.047	0.020
	0.255	3.410	0.004	0.003
	0.255	3.410	0.004	0.003
	0.255	3.410	0.004	0.003
	0.255	3.410	0.004	0.003
	0.166	1.555	0.047	0.020
	0.001	0.010	0.000	0.000
	0.350	3.284	0.098	0.041
	0.009	0.087	0.003	0.001
	0.313	2.938	0.088	0.037
	0.007	0.068	0.002	0.001
	0.258	2.419	0.072	0.031
	0.003	0.024	0.001	0.000
	0.020	0.189	0.006	0.002

Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day		
1		40		
1		40		
1		40		
	NOx	CO	PM10	PM2.5
	6.66	0.67	0.16	0.09
	6.66	0.67	0.16	0.09
	6.66	0.67	0.16	0.09
	0.59	0.06	0.01	0.01
	0.00	0.00	0.00	0.00
	0.59	0.06	0.01	0.01
	0.02	0.00	0.00	0.00
	0.59	0.06	0.01	0.01
	0.01	0.00	0.00	0.00

Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day
0.03	0.3	0.0	0.1
0.03	0.3	0.0	0.1
0.03	0.3	0.0	0.1

Type	ROG pounds/day	CO pounds/day	NOx pounds/day
Aerial Lifts	0.00	0.00	0.00
Air Compressors	0.00	0.00	0.00
Bore/Drill Rigs	0.00	0.00	0.00
Cement and Mortar Mixers	0.00	0.00	0.00
Concrete/Industrial Saws	0.00	0.00	0.00
Cranes	0.00	0.00	0.00
Crawler Tractors	0.66	4.47	8.32
Crushing/Proc. Equipment	0.00	0.00	0.00
Excavators	0.31	2.79	3.20
Forklifts	0.00	0.00	0.00
Generator Sets	0.00	0.00	0.00
Graders	0.00	0.00	0.00
Off-Highway Tractors	0.00	0.00	0.00
Off-Highway Trucks	0.00	0.00	0.00
Other Construction Equipment	0.00	0.00	0.00
Other General Industrial Equipment	0.00	0.00	0.00
Other Material Handling Equipment	0.00	0.00	0.00
Pavers	0.00	0.00	0.00
Paving Equipment	0.00	0.00	0.00
Plate Compactors	0.00	0.00	0.00
Pressure Washers	0.00	0.00	0.00
Pumps	0.00	0.00	0.00
Rollers	0.00	0.00	0.00
Rough Terrain Forklifts	0.00	0.00	0.00
Rubber Tired Dozers	0.00	0.00	0.00
Rubber Tired Loaders	0.00	0.00	0.00
Scrapers	0.00	0.00	0.00
Signal Boards	1.98	9.03	8.58
Skid Steer Loaders	0.00	0.00	0.00
Surfacing Equipment	0.00	0.00	0.00
Sweepers/Scrubbers	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0.00	0.00	0.00
Trenchers	0.00	0.00	0.00
Welders	0.00	0.00	0.00
pounds per day	2.9	16.3	20.1
tons per phase	0.0	0.1	0.1

Type	ROG pounds/day	CO pounds/day	NOx pounds/day
Aerial Lifts	0.00	0.00	0.00
Air Compressors	0.00	0.00	0.00
Bore/Drill Rigs	0.00	0.00	0.00
Cement and Mortar Mixers	0.00	0.00	0.00
Concrete/Industrial Saws	0.00	0.00	0.00
Cranes	0.00	0.00	0.00
Crawler Tractors	0.66	4.47	8.32
Crushing/Proc. Equipment	0.00	0.00	0.00
Excavators	0.94	8.37	9.60
Forklifts	0.00	0.00	0.00
Generator Sets	0.00	0.00	0.00
Graders	0.87	3.46	8.31
Off-Highway Tractors	0.00	0.00	0.00
Off-Highway Trucks	0.00	0.00	0.00
Other Construction Equipment	0.00	0.00	0.00
Other General Industrial Equipment	0.00	0.00	0.00
Other Material Handling Equipment	0.00	0.00	0.00
Pavers	0.00	0.00	0.00
Paving Equipment	0.00	0.00	0.00
Plate Compactors	0.00	0.00	0.00
Pressure Washers	0.00	0.00	0.00
Pumps	0.00	0.00	0.00
Rollers	0.54	3.02	4.95
Rough Terrain Forklifts	0.00	0.00	0.00
Rubber Tired Dozers	0.00	0.00	0.00
Rubber Tired Loaders	0.44	3.11	5.26
Scrapers	2.37	14.51	28.08
Signal Boards	1.98	9.03	8.58
Skid Steer Loaders	0.00	0.00	0.00
Surfacing Equipment	0.00	0.00	0.00
Sweepers/Scrubbers	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0.56	3.14	5.28
Trenchers	0.00	0.00	0.00
Welders	0.00	0.00	0.00
pounds per day	8.4	49.1	78.4
tons per phase	0.2	1.3	2.1

	ROG	CO	NOx
	pounds/day	pounds/day	pounds/day
Aerial Lifts	0.00	0.00	0.00
Air Compressors	0.58	3.40	3.86
Bore/Drill Rigs	0.00	0.00	0.00
Cement and Mortar Mixers	0.00	0.00	0.00
Concrete/Industrial Saws	0.00	0.00	0.00
Cranes	0.00	0.00	0.00
Crawler Tractors	0.00	0.00	0.00
Crushing/Proc. Equipment	0.00	0.00	0.00
Excavators	0.00	0.00	0.00
Forklifts	0.00	0.00	0.00
Generator Sets	0.43	2.96	3.42
Graders	0.87	3.46	8.31
Off-Highway Tractors	0.00	0.00	0.00
Off-Highway Trucks	0.00	0.00	0.00
Other Construction Equipment	0.00	0.00	0.00
Other General Industrial Equipment	0.00	0.00	0.00
Other Material Handling Equipment	0.00	0.00	0.00
Pavers	0.00	0.00	0.00
Paving Equipment	0.00	0.00	0.00
Plate Compactors	0.04	0.21	0.25
Pressure Washers	0.00	0.00	0.00
Pumps	0.36	2.44	2.83
Rollers	0.00	0.00	0.00
Rough Terrain Forklifts	0.17	2.03	2.02
Rubber Tired Dozers	0.00	0.00	0.00
Rubber Tired Loaders	0.00	0.00	0.00
Scrapers	2.37	14.51	28.08
Signal Boards	1.98	9.03	8.58
Skid Steer Loaders	0.00	0.00	0.00
Surfacing Equipment	0.00	0.00	0.00
Sweepers/Scrubbers	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0.56	3.14	5.28
Trenchers	0.00	0.00	0.00
Welders	0.00	0.00	0.00
pounds per day	7.4	41.2	62.6
tons per phase	0.2	1.0	1.4

Type	ROG pounds/day	CO pounds/day	NOx pounds/day
Aerial Lifts	0.00	0.00	0.00
Air Compressors	0.00	0.00	0.00
Bore/Drill Rigs	0.00	0.00	0.00
Cement and Mortar Mixers	0.00	0.00	0.00
Concrete/Industrial Saws	0.00	0.00	0.00
Cranes	0.00	0.00	0.00
Crawler Tractors	0.00	0.00	0.00
Crushing/Proc. Equipment	0.00	0.00	0.00
Excavators	0.00	0.00	0.00
Forklifts	0.00	0.00	0.00
Generator Sets	0.00	0.00	0.00
Graders	0.00	0.00	0.00
Off-Highway Tractors	0.00	0.00	0.00
Off-Highway Trucks	0.00	0.00	0.00
Other Construction Equipment	0.00	0.00	0.00
Other General Industrial Equipment	0.00	0.00	0.00
Other Material Handling Equipment	0.00	0.00	0.00
Pavers	0.33	2.84	3.45
Paving Equipment	0.24	2.69	2.59
Plate Compactors	0.00	0.00	0.00
Pressure Washers	0.00	0.00	0.00
Pumps	0.00	0.00	0.00
Rollers	0.80	4.53	7.43
Rough Terrain Forklifts	0.00	0.00	0.00
Rubber Tired Dozers	0.00	0.00	0.00
Rubber Tired Loaders	0.00	0.00	0.00
Scrapers	0.00	0.00	0.00
Signal Boards	1.98	9.03	8.58
Skid Steer Loaders	0.00	0.00	0.00
Surfacing Equipment	0.00	0.00	0.00
Sweepers/Scrubbers	0.00	0.00	0.00
Tractors/Loaders/Backhoes	0.56	3.14	5.28
Trenchers	0.00	0.00	0.00
Welders	0.00	0.00	0.00
pounds per day	3.9	22.2	27.3
tons per phase	0.0	0.2	0.3
	0.4	2.6	3.9

through C322 and E289 through E322.

Default Values Horsepower		Default Values Hours/day
63		8
106		8
206		8
10		8
64		8
226		8
208		8
142		8
163		8
89		8
66		8
175		8
123		8
400		8
172		8
88		8
167		8
126		8
131		8
8		8
26		8
53		8
81		8
100		8
255		8
200		8
362		8
20		8
65		8
254		8
64		8
98		8
81		8
45		8



project, click this button to clear data  
1. This button will only work if you  
enable macros when loading this  
spreadsheet.

%	2007	%
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

**Modeling is part of the project.**

<b>CO2</b>
1624.61
0.00
0.00
0.00

<b>CO2</b>
443.880
443.880
443.880
443.880
95.711
95.711
95.711
95.711
444.713
2.935
938.838
24.785
840.013
19.404
691.775
6.849
53.973

<b>CO2</b>
1624.61
1624.61
1624.61
143.14
0.94
143.14
3.78
143.14
3.31

PM2.5 tons/per period
0.0
0.0
0.0

PM10	PM2.5	CO2
pounds/day	pounds/day	pounds/day
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.31	0.29	824.93
0.00	0.00	0.00
0.16	0.14	572.78
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.52	0.48	1102.04
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
1.0	0.9	2499.7
0.0	0.0	16.5

PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.31	0.29	824.93
0.00	0.00	0.00
0.47	0.43	1718.33
0.00	0.00	0.00
0.00	0.00	0.00
0.47	0.43	667.39
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.34	0.31	558.85
0.00	0.00	0.00
0.00	0.00	0.00
0.18	0.16	662.49
1.11	1.02	3217.12
0.52	0.48	1102.04
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.37	0.34	670.05
0.00	0.00	0.00
0.00	0.00	0.00
3.8	3.5	9421.2
0.1	0.1	248.7

PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
0.00	0.00	0.00
0.30	0.27	507.95
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.23	0.21	487.07
0.47	0.43	667.39
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.01	0.01	34.45
0.00	0.00	0.00
0.19	0.18	396.14
0.00	0.00	0.00
0.10	0.09	372.67
0.00	0.00	0.00
0.00	0.00	0.00
1.11	1.02	3217.12
0.52	0.48	1102.04
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.37	0.34	670.05
0.00	0.00	0.00
0.00	0.00	0.00
3.3	3.0	7454.9
0.1	0.1	172.2

PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.17	0.16	482.19
0.13	0.12	426.37
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.51	0.47	838.28
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.52	0.48	1102.04
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.37	0.34	670.05
0.00	0.00	0.00
0.00	0.00	0.00
1.7	1.6	3518.9
0.0	0.0	34.8
0.2	0.2	472.3





Year	ROG	Weighted - Grubbing	Weighted - Grading	Weighted - Drainage	Weighted Paving	NOx
2009	0.1332	-	-	-	-	0.4682
2010	0.1140	-	-	-	-	0.4124
2011	0.0982	-	-	-	-	0.3637
2012	0.0843	-	-	-	-	0.3206
2013	0.0722	-	-	-	-	0.2827
2014	0.0609	-	-	-	-	0.2488
2015	0.0507	-	-	-	-	0.2192
2016	0.0424	-	-	-	-	0.1942
2017	0.0348	-	-	-	-	0.1724
2018	0.0288	0.0288	0.0288	0.0288	0.0288	0.1543
2019	0.0250	-	-	-	-	0.1402
2020	0.0223	-	-	-	-	0.1288
2021	0.0207	-	-	-	-	0.1196
2022	0.0193	-	-	-	-	0.1117
2023	0.0181	-	-	-	-	0.1050
2024	0.0171	-	-	-	-	0.0994
2025	0.0162	-	-	-	-	0.0946
		0.0288	0.0288	0.0288	0.0288	

**Heavy-Heavy Duty Diesel Truck**

Water Truck Commute Emissions (EMFAC2011-HD web, T7 Single Unit Construction Truck)

Running Exhaust (g/mi)

Model Year	ROG	Weighted-Grubbing	Weighted - Grading	Weighted - Drainage	Weighted Paving	NOx
2009	0.5461	-	-	-	-	14.1399
2010	0.5341	-	-	-	-	13.5704
2011	0.5194	-	-	-	-	12.9096
2012	0.4608	-	-	-	-	12.1601
2013	0.4024	-	-	-	-	11.3235
2014	0.2846	-	-	-	-	10.4258
2015	0.2456	-	-	-	-	9.4052
2016	0.1569	-	-	-	-	8.2519
2017	0.1451	-	-	-	-	7.4301
2018	0.1491	0.1491	0.1491	0.1491	0.1491	6.6629
2019	0.1527	-	-	-	-	5.8768
2020	0.1568	-	-	-	-	4.6723
2021	0.1673	-	-	-	-	2.8722
2022	0.1808	-	-	-	-	1.7730
2023	0.1670	-	-	-	-	1.3478
2024	0.1683	-	-	-	-	1.3659
2025	0.1694	-	-	-	-	1.3805
		0.1491	0.1491	0.1491	0.1491	

	B	C	D	E	F	G	H	I	J	K
5	Emissions (g/bhp-hr)		ROG	ROG	ROG	ROG		CO	CO	CO
6	Aerial Lifts		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
7		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/Lar	Grading	Drainage
12	2009	0.1542	-	-	-	-	0.7783	-	-	-
13	2010	0.1296	-	-	-	-	0.7783	-	-	-
14	2011	0.1101	-	-	-	-	0.7783	-	-	-
15	2012	0.0944	-	-	-	-	0.7783	-	-	-
16	2013	0.0782	-	-	-	-	0.7783	-	-	-
17	2014	0.0653	-	-	-	-	0.7783	-	-	-
18	2015	0.0615	-	-	-	-	0.7783	-	-	-
19	2016	0.0534	-	-	-	-	0.7783	-	-	-
20	2017	0.0460	-	-	-	-	0.7783	-	-	-
21	2018	0.0393	0.0393	0.0393	0.0393	0.0393	0.7783	0.7783	0.7783	0.7783
22	2019	0.0381	-	-	-	-	0.7783	-	-	-
23	2020	0.0371	-	-	-	-	0.7783	-	-	-
24	2021	0.0351	-	-	-	-	0.7783	-	-	-
25	2022	0.0338	-	-	-	-	0.7783	-	-	-
26	2023	0.0324	-	-	-	-	0.7783	-	-	-
27	2024	0.0324	-	-	-	-	0.7783	-	-	-
28	2025	0.0319	-	-	-	-	0.7783	-	-	-
29			0.0393	0.0393	0.0393	0.0393		0.7783	0.7783	0.7783
30										
31	Air Compressors		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
32		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/Lar	Grading	Drainage
37	2009	0.6074	-	-	-	-	1.9501	-	-	-
38	2010	0.5767	-	-	-	-	1.9358	-	-	-
39	2011	0.5434	-	-	-	-	1.9194	-	-	-
40	2012	0.5064	-	-	-	-	1.9000	-	-	-
41	2013	0.4686	-	-	-	-	1.8805	-	-	-
42	2014	0.4312	-	-	-	-	1.8614	-	-	-
43	2015	0.3936	-	-	-	-	1.8432	-	-	-
44	2016	0.3674	-	-	-	-	1.8374	-	-	-
45	2017	0.3403	-	-	-	-	1.8312	-	-	-
46	2018	0.3125	0.3125	0.3125	0.3125	0.3125	1.8246	1.8246	1.8246	1.8246
47	2019	0.2847	-	-	-	-	1.8175	-	-	-
48	2020	0.2633	-	-	-	-	1.8123	-	-	-
49	2021	0.2177	-	-	-	-	1.7627	-	-	-
50	2022	0.2040	-	-	-	-	1.7598	-	-	-
51	2023	0.1920	-	-	-	-	1.7584	-	-	-
52	2024	0.1816	-	-	-	-	1.7578	-	-	-
53	2025	0.1720	-	-	-	-	1.7573	-	-	-
54			0.3125	0.3125	0.3125	0.3125		1.8246	1.8246	1.8246
55										
56	Bore/Drill Rigs		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
57		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
62	2009	0.1339	-	-	-	-	1.0596	-	-	-
63	2010	0.1332	-	-	-	-	1.0571	-	-	-
64	2011	0.1281	-	-	-	-	1.0541	-	-	-
65	2012	0.1322	-	-	-	-	1.0539	-	-	-
66	2013	0.1265	-	-	-	-	1.0528	-	-	-
67	2014	0.1143	-	-	-	-	1.0470	-	-	-
68	2015	0.1122	-	-	-	-	1.0457	-	-	-
69	2016	0.1013	-	-	-	-	1.0474	-	-	-
70	2017	0.0912	-	-	-	-	1.0470	-	-	-
71	2018	0.0813	0.0813	0.0813	0.0813	0.0813	1.0432	1.0432	1.0432	1.0432
72	2019	0.0754	-	-	-	-	1.0410	-	-	-
73	2020	0.0749	-	-	-	-	1.0441	-	-	-
74	2021	0.0697	-	-	-	-	1.0467	-	-	-
75	2022	0.0605	-	-	-	-	1.0484	-	-	-
76	2023	0.0581	-	-	-	-	1.0505	-	-	-
77	2024	0.0568	-	-	-	-	1.0528	-	-	-
78	2025	0.0565	-	-	-	-	1.0526	-	-	-
79			0.0813	0.0813	0.0813	0.0813		1.0432	1.0432	1.0432
80										
81										
82										
83	Cement and Mortar Mixers		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
84		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
89	2009	0.4151	-	-	-	-	1.9680	-	-	-
90	2010	0.3974	-	-	-	-	1.9559	-	-	-
91	2011	0.3838	-	-	-	-	1.9483	-	-	-
92	2012	0.3779	-	-	-	-	1.9444	-	-	-
93	2013	0.3748	-	-	-	-	1.9432	-	-	-
94	2014	0.3731	-	-	-	-	1.9432	-	-	-
95	2015	0.3718	-	-	-	-	1.9432	-	-	-
96	2016	0.3710	-	-	-	-	1.9432	-	-	-
97	2017	0.3706	-	-	-	-	1.9432	-	-	-
98	2018	0.3705	0.3705	0.3705	0.3705	0.3705	1.9432	1.9432	1.9432	1.9432
99	2019	0.3705	-	-	-	-	1.9432	-	-	-
100	2020	0.3705	-	-	-	-	1.9432	-	-	-
101	2021	0.3705	-	-	-	-	1.9432	-	-	-
102	2022	0.3705	-	-	-	-	1.9432	-	-	-
103	2023	0.3705	-	-	-	-	1.9432	-	-	-



	B	C	D	E	F	G	H	I	J	K
193	Crushing/Proc. Equipment		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
194		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
199	2009	0.6594	-	-	-	-	-	2.5879	-	-
200	2010	0.6281	-	-	-	-	-	2.5803	-	-
201	2011	0.5929	-	-	-	-	-	2.5702	-	-
202	2012	0.5542	-	-	-	-	-	2.5589	-	-
203	2013	0.5156	-	-	-	-	-	2.5487	-	-
204	2014	0.4784	-	-	-	-	-	2.5402	-	-
205	2015	0.4395	-	-	-	-	-	2.5336	-	-
206	2016	0.4018	-	-	-	-	-	2.5284	-	-
207	2017	0.3660	-	-	-	-	-	2.5247	-	-
208	2018	0.3334	0.3334	0.3334	0.3334	0.3334		2.5228	2.5228	2.5228
209	2019	0.3077	-	-	-	-	-	2.5222	-	-
210	2020	0.2870	-	-	-	-	-	2.5225	-	-
211	2021	0.2690	-	-	-	-	-	2.5235	-	-
212	2022	0.2525	-	-	-	-	-	2.5251	-	-
213	2023	0.2377	-	-	-	-	-	2.5276	-	-
214	2024	0.2240	-	-	-	-	-	2.5303	-	-
215	2025	0.2107	-	-	-	-	-	2.5325	-	-
216			0.3334	0.3334	0.3334	0.3334		2.5228	2.5228	2.5228
217										
218										
219										
220	Excavators		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
221		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
226	2009	0.1968	-	-	-	-	-	0.9735	-	-
227	2010	0.1924	-	-	-	-	-	0.9734	-	-
228	2011	0.1791	-	-	-	-	-	0.9730	-	-
229	2012	0.1796	-	-	-	-	-	0.9727	-	-
230	2013	0.1692	-	-	-	-	-	0.9728	-	-
231	2014	0.1559	-	-	-	-	-	0.9729	-	-
232	2015	0.1534	-	-	-	-	-	0.9729	-	-
233	2016	0.1429	-	-	-	-	-	0.9730	-	-
234	2017	0.1333	-	-	-	-	-	0.9728	-	-
235	2018	0.1091	0.1091	0.1091	0.1091	0.1091		0.9729	0.9729	0.9729
236	2019	0.0984	-	-	-	-	-	0.9726	-	-
237	2020	0.0925	-	-	-	-	-	0.9728	-	-
238	2021	0.0865	-	-	-	-	-	0.9730	-	-
239	2022	0.0764	-	-	-	-	-	0.9726	-	-
240	2023	0.0712	-	-	-	-	-	0.9728	-	-
241	2024	0.0680	-	-	-	-	-	0.9731	-	-
242	2025	0.0631	-	-	-	-	-	0.9733	-	-
243			0.1091	0.1091	0.1091	0.1091		0.9729	0.9729	0.9729
244										
245										
246										
247	Forklifts		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
248		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
253	2009	0.1862	-	-	-	-	-	0.5722	-	-
254	2010	0.1848	-	-	-	-	-	0.5722	-	-
255	2011	0.1809	-	-	-	-	-	0.5722	-	-
256	2012	0.1815	-	-	-	-	-	0.5722	-	-
257	2013	0.1762	-	-	-	-	-	0.5722	-	-
258	2014	0.1671	-	-	-	-	-	0.5722	-	-
259	2015	0.1617	-	-	-	-	-	0.5722	-	-
260	2016	0.1521	-	-	-	-	-	0.5722	-	-
261	2017	0.1413	-	-	-	-	-	0.5722	-	-
262	2018	0.1194	0.1194	0.1194	0.1194	0.1194		0.5722	0.5722	0.5722
263	2019	0.1072	-	-	-	-	-	0.5722	-	-
264	2020	0.0965	-	-	-	-	-	0.5722	-	-
265	2021	0.0867	-	-	-	-	-	0.5722	-	-
266	2022	0.0761	-	-	-	-	-	0.5722	-	-
267	2023	0.0687	-	-	-	-	-	0.5722	-	-
268	2024	0.0631	-	-	-	-	-	0.5722	-	-
269	2025	0.0582	-	-	-	-	-	0.5722	-	-
270			0.1194	0.1194	0.1194	0.1194		0.5722	0.5722	0.5722
271										
272										
273										
274	Generator Sets		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
275		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
280	2009	0.7833	-	-	-	-	-	2.7396	-	-
281	2010	0.7369	-	-	-	-	-	2.7154	-	-
282	2011	0.6885	-	-	-	-	-	2.6903	-	-
283	2012	0.6359	-	-	-	-	-	2.6634	-	-
284	2013	0.5833	-	-	-	-	-	2.6371	-	-
285	2014	0.5317	-	-	-	-	-	2.6120	-	-
286	2015	0.4804	-	-	-	-	-	2.5884	-	-
287	2016	0.4433	-	-	-	-	-	2.5763	-	-
288	2017	0.4056	-	-	-	-	-	2.5642	-	-
289	2018	0.3675	0.3675	0.3675	0.3675	0.3675		2.5524	2.5524	2.5524
290	2019	0.3299	-	-	-	-	-	2.5408	-	-
291	2020	0.3012	-	-	-	-	-	2.5325	-	-

	B	C	D	E	F	G	H	I	J	K	
292		2021	0.2483	-	-	-	-	2.4901	-	-	-
293		2022	0.2303	-	-	-	-	2.4851	-	-	-
294		2023	0.2146	-	-	-	-	2.4814	-	-	-
295		2024	0.2007	-	-	-	-	2.4786	-	-	-
296		2025	0.1882	-	-	-	-	2.4760	-	-	-
297				0.3675	0.3675	0.3675	0.3675		2.5524	2.5524	2.5524
298											
299											
300											
301	Graders										
302		ROG		Weighted Grubbing/Land	Weighted Grading	Weighted Drainage	Weighted Paving	CO	Weighted Grubbing/La	Weighted Grading	Weighted Drainage
307		2009	0.3650	-	-	-	-	1.1350	-	-	-
308		2010	0.3686	-	-	-	-	1.1349	-	-	-
309		2011	0.3665	-	-	-	-	1.1347	-	-	-
310		2012	0.3677	-	-	-	-	1.1346	-	-	-
311		2013	0.3666	-	-	-	-	1.1341	-	-	-
312		2014	0.3623	-	-	-	-	1.1331	-	-	-
313		2015	0.3610	-	-	-	-	1.1326	-	-	-
314		2016	0.3463	-	-	-	-	1.1310	-	-	-
315		2017	0.3238	-	-	-	-	1.1279	-	-	-
316		2018	0.2829	0.2829	0.2829	0.2829	0.2829	1.1248	1.1248	1.1248	1.1248
317		2019	0.2604	-	-	-	-	1.1240	-	-	-
318		2020	0.2424	-	-	-	-	1.1231	-	-	-
319		2021	0.2161	-	-	-	-	1.1243	-	-	-
320		2022	0.1883	-	-	-	-	1.1244	-	-	-
321		2023	0.1668	-	-	-	-	1.1241	-	-	-
322		2024	0.1556	-	-	-	-	1.1242	-	-	-
323		2025	0.1406	-	-	-	-	1.1242	-	-	-
324				0.2829	0.2829	0.2829	0.2829		1.1248	1.1248	1.1248
325											
326											
327											
328	Off-Highway Tractors										
329		ROG		Weighted Grubbing/Land	Weighted Grading	Weighted Drainage	Weighted Paving	CO	Weighted Grubbing/La	Weighted Grading	Weighted Drainage
334		2009	0.2402	-	-	-	-	1.1749	-	-	-
335		2010	0.2388	-	-	-	-	1.1751	-	-	-
336		2011	0.2255	-	-	-	-	1.1747	-	-	-
337		2012	0.2197	-	-	-	-	1.1746	-	-	-
338		2013	0.2085	-	-	-	-	1.1747	-	-	-
339		2014	0.1933	-	-	-	-	1.1751	-	-	-
340		2015	0.1831	-	-	-	-	1.1744	-	-	-
341		2016	0.1782	-	-	-	-	1.1750	-	-	-
342		2017	0.1622	-	-	-	-	1.1739	-	-	-
343		2018	0.1435	0.1435	0.1435	0.1435	0.1435	1.1738	1.1738	1.1738	1.1738
344		2019	0.1341	-	-	-	-	1.1738	-	-	-
345		2020	0.1235	-	-	-	-	1.1737	-	-	-
346		2021	0.1179	-	-	-	-	1.1738	-	-	-
347		2022	0.1054	-	-	-	-	1.1735	-	-	-
348		2023	0.0916	-	-	-	-	1.1739	-	-	-
349		2024	0.0832	-	-	-	-	1.1742	-	-	-
350		2025	0.0799	-	-	-	-	1.1747	-	-	-
351				0.1435	0.1435	0.1435	0.1435		1.1738	1.1738	1.1738
352											
353											
354											
355	Off-Highway Trucks										
356		ROG		Weighted Grubbing/Land	Weighted Grading	Weighted Drainage	Weighted Paving	CO	Weighted Grubbing/La	Weighted Grading	Weighted Drainage
361		2009	0.1650	-	-	-	-	0.6097	-	-	-
362		2010	0.1719	-	-	-	-	0.6096	-	-	-
363		2011	0.1731	-	-	-	-	0.6094	-	-	-
364		2012	0.1766	-	-	-	-	0.6094	-	-	-
365		2013	0.1688	-	-	-	-	0.6097	-	-	-
366		2014	0.1573	-	-	-	-	0.6099	-	-	-
367		2015	0.1537	-	-	-	-	0.6099	-	-	-
368		2016	0.1404	-	-	-	-	0.6091	-	-	-
369		2017	0.1300	-	-	-	-	0.6085	-	-	-
370		2018	0.1147	0.1147	0.1147	0.1147	0.1147	0.6085	0.6085	0.6085	0.6085
371		2019	0.1053	-	-	-	-	0.6082	-	-	-
372		2020	0.0984	-	-	-	-	0.6079	-	-	-
373		2021	0.0899	-	-	-	-	0.6079	-	-	-
374		2022	0.0784	-	-	-	-	0.6081	-	-	-
375		2023	0.0748	-	-	-	-	0.6085	-	-	-
376		2024	0.0737	-	-	-	-	0.6087	-	-	-
377		2025	0.0709	-	-	-	-	0.6084	-	-	-
378				0.1147	0.1147	0.1147	0.1147		0.6085	0.6085	0.6085
379											
380											
381											
382	Other Construction Equipment										
383		ROG		Weighted Grubbing/Land	Weighted Grading	Weighted Drainage	Weighted Paving	CO	Weighted Grubbing/La	Weighted Grading	Weighted Drainage
388		2009	0.2776	-	-	-	-	1.1888	-	-	-
389		2010	0.2811	-	-	-	-	1.1889	-	-	-
390		2011	0.2651	-	-	-	-	1.1885	-	-	-

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391		2012	0.2670	-	-	-	-	1.1885	-	-	-
392		2013	0.2587	-	-	-	-	1.1891	-	-	-
393		2014	0.2463	-	-	-	-	1.1895	-	-	-
394		2015	0.2422	-	-	-	-	1.1894	-	-	-
395		2016	0.2280	-	-	-	-	1.1891	-	-	-
396		2017	0.2176	-	-	-	-	1.1887	-	-	-
397		2018	0.1897	0.1897	0.1897	0.1897	0.1897	1.1884	1.1884	1.1884	1.1884
398		2019	0.1791	-	-	-	-	1.1891	-	-	-
399		2020	0.1686	-	-	-	-	1.1890	-	-	-
400		2021	0.1433	-	-	-	-	1.1885	-	-	-
401		2022	0.1283	-	-	-	-	1.1881	-	-	-
402		2023	0.1189	-	-	-	-	1.1880	-	-	-
403		2024	0.1133	-	-	-	-	1.1879	-	-	-
404		2025	0.1021	-	-	-	-	1.1887	-	-	-
405				0.1897	0.1897	0.1897	0.1897		1.1884	1.1884	1.1884
406											
407											
408											
409	Other General Industrial Equipment			Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
410		ROG		Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
415		2009	0.3056	-	-	-	-	0.8686	-	-	-
416		2010	0.3057	-	-	-	-	0.8686	-	-	-
417		2011	0.3024	-	-	-	-	0.8686	-	-	-
418		2012	0.3031	-	-	-	-	0.8686	-	-	-
419		2013	0.2952	-	-	-	-	0.8686	-	-	-
420		2014	0.2820	-	-	-	-	0.8686	-	-	-
421		2015	0.2720	-	-	-	-	0.8686	-	-	-
422		2016	0.2559	-	-	-	-	0.8686	-	-	-
423		2017	0.2360	-	-	-	-	0.8686	-	-	-
424		2018	0.1993	0.1993	0.1993	0.1993	0.1993	0.8686	0.8686	0.8686	0.8686
425		2019	0.1787	-	-	-	-	0.8686	-	-	-
426		2020	0.1595	-	-	-	-	0.8686	-	-	-
427		2021	0.1444	-	-	-	-	0.8686	-	-	-
428		2022	0.1211	-	-	-	-	0.8686	-	-	-
429		2023	0.1100	-	-	-	-	0.8686	-	-	-
430		2024	0.1027	-	-	-	-	0.8686	-	-	-
431		2025	0.0921	-	-	-	-	0.8686	-	-	-
432				0.1993	0.1993	0.1993	0.1993		0.8686	0.8686	0.8686
433											
434											
435											
436	Other Material Handling Equipment			Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
437		ROG		Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
442		2009	0.2426	-	-	-	-	1.0781	-	-	-
443		2010	0.2447	-	-	-	-	1.0781	-	-	-
444		2011	0.2417	-	-	-	-	1.0781	-	-	-
445		2012	0.2408	-	-	-	-	1.0781	-	-	-
446		2013	0.2315	-	-	-	-	1.0781	-	-	-
447		2014	0.2186	-	-	-	-	1.0781	-	-	-
448		2015	0.2172	-	-	-	-	1.0781	-	-	-
449		2016	0.2022	-	-	-	-	1.0781	-	-	-
450		2017	0.1766	-	-	-	-	1.0781	-	-	-
451		2018	0.1351	0.1351	0.1351	0.1351	0.1351	1.0781	1.0781	1.0781	1.0781
452		2019	0.1157	-	-	-	-	1.0781	-	-	-
453		2020	0.1043	-	-	-	-	1.0781	-	-	-
454		2021	0.1029	-	-	-	-	1.0781	-	-	-
455		2022	0.0933	-	-	-	-	1.0781	-	-	-
456		2023	0.0897	-	-	-	-	1.0781	-	-	-
457		2024	0.0862	-	-	-	-	1.0781	-	-	-
458		2025	0.0783	-	-	-	-	1.0781	-	-	-
459				0.1351	0.1351	0.1351	0.1351		1.0781	1.0781	1.0781
460											
461											
462											
463	Pavers			Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
468		2009	0.2507	-	-	-	-	1.2817	-	-	-
469		2010	0.2534	-	-	-	-	1.2818	-	-	-
470		2011	0.2465	-	-	-	-	1.2820	-	-	-
471		2012	0.2476	-	-	-	-	1.2822	-	-	-
472		2013	0.2302	-	-	-	-	1.2809	-	-	-
473		2014	0.2184	-	-	-	-	1.2801	-	-	-
474		2015	0.2128	-	-	-	-	1.2805	-	-	-
475		2016	0.1884	-	-	-	-	1.2808	-	-	-
476		2017	0.1691	-	-	-	-	1.2816	-	-	-
477		2018	0.1473	0.1473	0.1473	0.1473	0.1473	1.2822	1.2822	1.2822	1.2822
478		2019	0.1299	-	-	-	-	1.2821	-	-	-
479		2020	0.1186	-	-	-	-	1.2818	-	-	-
480		2021	0.1112	-	-	-	-	1.2812	-	-	-
481		2022	0.0934	-	-	-	-	1.2817	-	-	-
482		2023	0.0867	-	-	-	-	1.2816	-	-	-
483		2024	0.0829	-	-	-	-	1.2815	-	-	-
484		2025	0.0785	-	-	-	-	1.2810	-	-	-
485				0.1473	0.1473	0.1473	0.1473		1.2822	1.2822	1.2822

	B	C	D	E	F	G	H	I	J	K
486										
487										
488										
489	Paving Equipment		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
490		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
495		2009	0.1752	-	-	-	-	1.1710	-	-
496		2010	0.1791	-	-	-	-	1.1710	-	-
497		2011	0.1765	-	-	-	-	1.1711	-	-
498		2012	0.1766	-	-	-	-	1.1708	-	-
499		2013	0.1661	-	-	-	-	1.1698	-	-
500		2014	0.1543	-	-	-	-	1.1698	-	-
501		2015	0.1527	-	-	-	-	1.1700	-	-
502		2016	0.1382	-	-	-	-	1.1703	-	-
503		2017	0.1273	-	-	-	-	1.1707	-	-
504		2018	0.1054	0.1054	0.1054	0.1054	0.1054	1.1705	1.1705	1.1705
505		2019	0.0944	-	-	-	-	1.1702	-	-
506		2020	0.0920	-	-	-	-	1.1701	-	-
507		2021	0.0852	-	-	-	-	1.1699	-	-
508		2022	0.0790	-	-	-	-	1.1699	-	-
509		2023	0.0757	-	-	-	-	1.1699	-	-
510		2024	0.0731	-	-	-	-	1.1699	-	-
511		2025	0.0651	-	-	-	-	1.1695	-	-
512				0.1054	0.1054	0.1054	0.1054		1.1705	1.1705
513										
514										
515										
516	Plate Compactors		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
517		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
522		2009	0.2882	-	-	-	-	1.4921	-	-
523		2010	0.2859	-	-	-	-	1.4921	-	-
524		2011	0.2848	-	-	-	-	1.4921	-	-
525		2012	0.2845	-	-	-	-	1.4921	-	-
526		2013	0.2845	-	-	-	-	1.4921	-	-
527		2014	0.2845	-	-	-	-	1.4921	-	-
528		2015	0.2845	-	-	-	-	1.4921	-	-
529		2016	0.2845	-	-	-	-	1.4921	-	-
530		2017	0.2845	-	-	-	-	1.4921	-	-
531		2018	0.2845	0.2845	0.2845	0.2845	0.2845	1.4921	1.4921	1.4921
532		2019	0.2845	-	-	-	-	1.4921	-	-
533		2020	0.2845	-	-	-	-	1.4921	-	-
534		2021	0.2845	-	-	-	-	1.4921	-	-
535		2022	0.2845	-	-	-	-	1.4921	-	-
536		2023	0.2845	-	-	-	-	1.4921	-	-
537		2024	0.2845	-	-	-	-	1.4921	-	-
538		2025	0.2845	-	-	-	-	1.4921	-	-
539				0.2845	0.2845	0.2845	0.2845		1.4921	1.4921
540										
541										
542										
543	Pressure Washers		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
544		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
549		2009	0.5144	-	-	-	-	1.3823	-	-
550		2010	0.4808	-	-	-	-	1.3475	-	-
551		2011	0.4447	-	-	-	-	1.3092	-	-
552		2012	0.4053	-	-	-	-	1.2667	-	-
553		2013	0.3656	-	-	-	-	1.2238	-	-
554		2014	0.3267	-	-	-	-	1.1826	-	-
555		2015	0.2914	-	-	-	-	1.1479	-	-
556		2016	0.2658	-	-	-	-	1.1268	-	-
557		2017	0.2398	-	-	-	-	1.1054	-	-
558		2018	0.2134	0.2134	0.2134	0.2134	0.2134	1.0838	1.0838	1.0838
559		2019	0.1873	-	-	-	-	1.0619	-	-
560		2020	0.1673	-	-	-	-	1.0452	-	-
561		2021	0.1356	-	-	-	-	1.0023	-	-
562		2022	0.1236	-	-	-	-	0.9916	-	-
563		2023	0.1131	-	-	-	-	0.9826	-	-
564		2024	0.1040	-	-	-	-	0.9751	-	-
565		2025	0.0961	-	-	-	-	0.9683	-	-
566				0.2134	0.2134	0.2134	0.2134		1.0838	1.0838
567										
568										
569										
570	Pumps		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
571		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
576		2009	0.8081	-	-	-	-	2.7822	-	-
577		2010	0.7614	-	-	-	-	2.7582	-	-
578		2011	0.7125	-	-	-	-	2.7329	-	-
579		2012	0.6592	-	-	-	-	2.7055	-	-
580		2013	0.6058	-	-	-	-	2.6786	-	-
581		2014	0.5533	-	-	-	-	2.6529	-	-
582		2015	0.5011	-	-	-	-	2.6287	-	-
583		2016	0.4637	-	-	-	-	2.6173	-	-
584		2017	0.4256	-	-	-	-	2.6059	-	-



	B	C	D	E	F	G	H	I	J	K
585	2018	0.3871	0.3871	0.3871	0.3871	0.3871	2.5947	2.5947	2.5947	2.5947
586	2019	0.3490	-	-	-	-	2.5835	-	-	-
587	2020	0.3198	-	-	-	-	2.5756	-	-	-
588	2021	0.2640	-	-	-	-	2.5278	-	-	-
589	2022	0.2456	-	-	-	-	2.5229	-	-	-
590	2023	0.2294	-	-	-	-	2.5195	-	-	-
591	2024	0.2151	-	-	-	-	2.5169	-	-	-
592	2025	0.2021	-	-	-	-	2.5146	-	-	-
593			0.3871	0.3871	0.3871	0.3871		2.5947	2.5947	2.5947
594										
595										
596										
597	Rollers		Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted
598		ROG	Grubbing/Land	Grading	Drainage	Paving	CO	Grubbing/La	Grading	Drainage
603	2009	0.3258	-	-	-	-	1.0656	-	-	-
604	2010	0.3246	-	-	-	-	1.0657	-	-	-
605	2011	0.3050	-	-	-	-	1.0649	-	-	-
606	2012	0.3049	-	-	-	-	1.0647	-	-	-
607	2013	0.2883	-	-	-	-	1.0646	-	-	-
608	2014	0.2729	-	-	-	-	1.0638	-	-	-
609	2015	0.2683	-	-	-	-	1.0637	-	-	-
610	2016	0.2467	-	-	-	-	1.0637	-	-	-

	L	M
5	CO	
6	Weighted	
7	Paving	NOx
12	-	1.7197
13	-	1.5814
14	-	1.4547
15	-	1.3522
16	-	1.2109
17	-	1.0395
18	-	0.9596
19	-	0.8390
20	-	0.7285
21	0.7783	0.6360
22	-	0.6092
23	-	0.5759
24	-	0.5374
25	-	0.5013
26	-	0.4771
27	-	0.4709
28	-	0.4656
29	0.7783	
30		
31	Weighted	
32	Paving	NOx
37	-	3.5865
38	-	3.4241
39	-	3.2512
40	-	3.0548
41	-	2.8606
42	-	2.6861
43	-	2.4880
44	-	2.3534
45	-	2.2153
46	1.8246	2.0735
47	-	1.9300
48	-	1.7971
49	-	1.5224
50	-	1.4087
51	-	1.3068
52	-	1.2250
53	-	1.1528
54	1.8246	
55		
56	Weighted	
57	Paving	NOx
62	-	2.4004
63	-	2.3124
64	-	2.1846
65	-	2.1687
66	-	2.0192
67	-	1.7711
68	-	1.6706
69	-	1.4583
70	-	1.2671
71	1.0432	1.0819
72	-	0.9519
73	-	0.9082
74	-	0.7794
75	-	0.5844
76	-	0.5259
77	-	0.4902
78	-	0.4810
79	1.0432	
80		
81		
82		
83	Weighted	
84	Paving	NOx
89	-	2.6767
90	-	2.5451
91	-	2.4371
92	-	2.3926
93	-	2.3649
94	-	2.3472
95	-	2.3341
96	-	2.3257
97	-	2.3213
98	1.9432	2.3199
99	-	2.3199
100	-	2.3199
101	-	2.3199
102	-	2.3199
103	-	2.3199

	L	M
104	-	2.3199
105	-	2.3199
106	1.9432	
107		
108		
109		
110	Weighted	
111	Paving	NOx
116	-	5.0944
117	-	4.8134
118	-	4.5439
119	-	4.2685
120	-	4.0057
121	-	3.7709
122	-	3.4998
123	-	3.2393
124	-	2.9835
125	2.6075	2.7402
126	-	2.5121
127	-	2.3094
128	-	2.1272
129	-	1.9610
130	-	1.8098
131	-	1.6903
132	-	1.5891
133	2.6075	
134		
135		
136		
137		
138	Weighted	
139	Paving	NOx
144	-	2.4288
145	-	2.4200
146	-	2.3911
147	-	2.3917
148	-	2.3496
149	-	2.2645
150	-	2.1958
151	-	2.1264
152	-	1.9174
153	0.7539	1.6632
154	-	1.4648
155	-	1.3147
156	-	1.1825
157	-	1.0203
158	-	0.9304
159	-	0.8545
160	-	0.7725
161	0.7539	
162		
163		
164		
165		
166	Weighted	
167	Paving	NOx
172	-	2.7729
173	-	2.7733
174	-	2.7542
175	-	2.7611
176	-	2.7305
177	-	2.6746
178	-	2.6342
179	-	2.5931
180	-	2.4698
181	1.2181	2.2682
182	-	2.1320
183	-	1.9863
184	-	1.8584
185	-	1.6023
186	-	1.3667
187	-	1.2663
188	-	1.0555
189	1.2181	
190		
191		
192		

	L	M
193	Weighted	
194	Paving	NOx
199	-	5.1983
200	-	4.9338
201	-	4.6469
202	-	4.3356
203	-	4.0432
204	-	3.7675
205	-	3.3934
206	-	3.0339
207	-	2.6927
208	2.5228	2.3785
209	-	2.1063
210	-	1.8663
211	-	1.6494
212	-	1.4523
213	-	1.2907
214	-	1.1488
215	-	1.0152
216	2.5228	
217		
218		
219		
220	Weighted	
221	Paving	NOx
226	-	2.2883
227	-	2.2263
228	-	2.0811
229	-	2.0580
230	-	1.9438
231	-	1.7785
232	-	1.7112
233	-	1.5585
234	-	1.4129
235	0.9729	1.1165
236	-	0.9672
237	-	0.8701
238	-	0.7766
239	-	0.6409
240	-	0.5585
241	-	0.5059
242	-	0.4406
243	0.9729	
244		
245		
246		
247	Weighted	
248	Paving	NOx
253	-	1.5517
254	-	1.5346
255	-	1.4994
256	-	1.4936
257	-	1.4503
258	-	1.3765
259	-	1.3268
260	-	1.2506
261	-	1.1694
262	0.5722	1.0081
263	-	0.9145
264	-	0.8307
265	-	0.7549
266	-	0.6754
267	-	0.6144
268	-	0.5657
269	-	0.5241
270	0.5722	
271		
272		
273		
274	Weighted	
275	Paving	NOx
280	-	5.0707
281	-	4.8338
282	-	4.5876
283	-	4.3120
284	-	4.0419
285	-	3.8009
286	-	3.5242
287	-	3.3371
288	-	3.1472
289	2.5524	2.9540
290	-	2.7589
291	-	2.5767

	L	M
292	-	2.1974
293	-	2.0388
294	-	1.8956
295	-	1.7800
296	-	1.6777
297	2.5524	
298		
299		
300		
301	Weighted	
302	Paving NOx	
307	-	3.6633
308	-	3.6742
309	-	3.6425
310	-	3.6362
311	-	3.6104
312	-	3.5565
313	-	3.5301
314	-	3.3716
315	-	3.1317
316	1.1248	2.6993
317	-	2.4577
318	-	2.2603
319	-	1.9779
320	-	1.6858
321	-	1.4500
322	-	1.3087
323	-	1.1337
324	1.1248	
325		
326		
327		
328	Weighted	
329	Paving NOx	
334	-	2.7415
335	-	2.6977
336	-	2.5612
337	-	2.4863
338	-	2.3609
339	-	2.1885
340	-	2.0572
341	-	1.9645
342	-	1.7533
343	1.1738	1.5232
344	-	1.3969
345	-	1.2587
346	-	1.1583
347	-	0.9750
348	-	0.7773
349	-	0.6514
350	-	0.5873
351	1.1738	
352		
353		
354		
355	Weighted	
356	Paving NOx	
361	-	2.1007
362	-	2.1083
363	-	2.0615
364	-	2.0534
365	-	1.9333
366	-	1.7895
367	-	1.7292
368	-	1.5459
369	-	1.4010
370	0.6085	1.1801
371	-	1.0191
372	-	0.8962
373	-	0.7461
374	-	0.5689
375	-	0.5057
376	-	0.4717
377	-	0.4063
378	0.6085	
379		
380		
381		
382	Weighted	
383	Paving NOx	
388	-	3.0247
389	-	3.0364
390	-	2.8750

	L	M
391	-	2.8730
392	-	2.7794
393	-	2.6469
394	-	2.5882
395	-	2.4166
396	-	2.2823
397	1.1884	1.9752
398	-	1.8415
399	-	1.7081
400	-	1.4283
401	-	1.2439
402	-	1.1208
403	-	1.0469
404	-	0.9003
405	1.1884	
406		
407		
408		
409	Weighted	
410	Paving	NOx
415	-	2.5284
416	-	2.5164
417	-	2.4769
418	-	2.4653
419	-	2.4032
420	-	2.2972
421	-	2.2216
422	-	2.0994
423	-	1.9550
424	0.8686	1.6930
425	-	1.5365
426	-	1.3876
427	-	1.2703
428	-	1.0933
429	-	0.9991
430	-	0.9252
431	-	0.8334
432	0.8686	
433		
434		
435		
436	Weighted	
437	Paving	NOx
442	-	2.6300
443	-	2.6206
444	-	2.5639
445	-	2.5335
446	-	2.4325
447	-	2.2918
448	-	2.2313
449	-	2.0601
450	-	1.7741
451	1.0781	1.3173
452	-	1.0964
453	-	0.9355
454	-	0.8880
455	-	0.7486
456	-	0.6993
457	-	0.6478
458	-	0.5518
459	1.0781	
460		
461		
462		
463	Paving	NOx
468	-	2.7677
469	-	2.7702
470	-	2.6800
471	-	2.6759
472	-	2.5170
473	-	2.3829
474	-	2.2999
475	-	2.0246
476	-	1.8083
477	1.2822	1.5566
478	-	1.3479
479	-	1.2123
480	-	1.1194
481	-	0.9054
482	-	0.8122
483	-	0.7514
484	-	0.6829
485	1.2822	

	L	M
486		
487		
488		
489	Weighted	
490	Paving	NOx
495	-	2.1495
496	-	2.1644
497	-	2.1218
498	-	2.1067
499	-	1.9898
500	-	1.8521
501	-	1.7633
502	-	1.5346
503	-	1.3836
504	1.1705	1.1264
505	-	0.9561
506	-	0.9073
507	-	0.8221
508	-	0.7362
509	-	0.6791
510	-	0.6339
511	-	0.5358
512	1.1705	
513		
514		
515		
516	Weighted	
517	Paving	NOx
522	-	1.8206
523	-	1.7967
524	-	1.7846
525	-	1.7814
526	-	1.7814
527	-	1.7814
528	-	1.7814
529	-	1.7814
530	-	1.7814
531	1.4921	1.7814
532	-	1.7814
533	-	1.7814
534	-	1.7814
535	-	1.7814
536	-	1.7814
537	-	1.7814
538	-	1.7814
539	1.4921	
540		
541		
542		
543	Weighted	
544	Paving	NOx
549	-	1.6710
550	-	1.6455
551	-	1.6181
552	-	1.5888
553	-	1.5235
554	-	1.4604
555	-	1.4047
556	-	1.3715
557	-	1.3379
558	1.0838	1.3034
559	-	1.2676
560	-	1.2330
561	-	1.1446
562	-	1.1107
563	-	1.0788
564	-	1.0487
565	-	1.0190
566	1.0838	
567		
568		
569		
570	Weighted	
571	Paving	NOx
576	-	5.1466
577	-	4.9074
578	-	4.6580
579	-	4.3784
580	-	4.1039
581	-	3.8588
582	-	3.5780
583	-	3.3884
584	-	3.1957

	L	M
585	2.5947	2.9995
586	-	2.8011
587	-	2.6159
588	-	2.2288
589	-	2.0675
590	-	1.9220
591	-	1.8043
592	-	1.7001
593	2.5947	
594		
595		
596		
597	Weighted	
598	Paving	NOx
603	-	2.8286
604	-	2.8145
605	-	2.6766
606	-	2.6587
607	-	2.5325
608	-	2.3977
609	-	2.3531
610	-	2.1783



	N	O	P	Q	R	S	T	U	V
5	NOx	NOx	NOx	NOx		PM10			
6	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
7	Grubbing/La	Grading	Drainage	Paving	PM10	Grubbing/Land Clear	Grading	Drainage	Paving
12	-	-	-	-	0.1137	-	-	-	-
13	-	-	-	-	0.1015	-	-	-	-
14	-	-	-	-	0.0886	-	-	-	-
15	-	-	-	-	0.0774	-	-	-	-
16	-	-	-	-	0.0622	-	-	-	-
17	-	-	-	-	0.0496	-	-	-	-
18	-	-	-	-	0.0441	-	-	-	-
19	-	-	-	-	0.0345	-	-	-	-
20	-	-	-	-	0.0257	-	-	-	-
21	0.6360	0.6360	0.6360	0.6360	0.0176	0.0176	0.0176	0.0176	0.0176
22	-	-	-	-	0.0150	-	-	-	-
23	-	-	-	-	0.0128	-	-	-	-
24	-	-	-	-	0.0103	-	-	-	-
25	-	-	-	-	0.0093	-	-	-	-
26	-	-	-	-	0.0082	-	-	-	-
27	-	-	-	-	0.0082	-	-	-	-
28	-	-	-	-	0.0080	-	-	-	-
29	0.6360	0.6360	0.6360	0.6360		0.0176	0.0176	0.0176	0.0176
30									
31	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
32	Grubbing/La	Grading	Drainage	Paving	PM10	Grubbing/Land Clear	Grading	Drainage	Paving
37	-	-	-	-	0.3218	-	-	-	-
38	-	-	-	-	0.3110	-	-	-	-
39	-	-	-	-	0.2987	-	-	-	-
40	-	-	-	-	0.2806	-	-	-	-
41	-	-	-	-	0.2595	-	-	-	-
42	-	-	-	-	0.2370	-	-	-	-
43	-	-	-	-	0.2139	-	-	-	-
44	-	-	-	-	0.1971	-	-	-	-
45	-	-	-	-	0.1792	-	-	-	-
46	2.0735	2.0735	2.0735	2.0735	0.1605	0.1605	0.1605	0.1605	0.1605
47	-	-	-	-	0.1413	-	-	-	-
48	-	-	-	-	0.1253	-	-	-	-
49	-	-	-	-	0.0961	-	-	-	-
50	-	-	-	-	0.0842	-	-	-	-
51	-	-	-	-	0.0734	-	-	-	-
52	-	-	-	-	0.0638	-	-	-	-
53	-	-	-	-	0.0547	-	-	-	-
54	2.0735	2.0735	2.0735	2.0735		0.1605	0.1605	0.1605	0.1605
55									
56	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
57	Grubbing/La	Grading	Drainage	Paving	PM10	Grubbing/Land Clear	Grading	Drainage	Paving
62	-	-	-	-	0.0712	-	-	-	-
63	-	-	-	-	0.0696	-	-	-	-
64	-	-	-	-	0.0665	-	-	-	-
65	-	-	-	-	0.0671	-	-	-	-
66	-	-	-	-	0.0621	-	-	-	-
67	-	-	-	-	0.0527	-	-	-	-
68	-	-	-	-	0.0500	-	-	-	-
69	-	-	-	-	0.0428	-	-	-	-
70	-	-	-	-	0.0364	-	-	-	-
71	1.0819	1.0819	1.0819	1.0819	0.0306	0.0306	0.0306	0.0306	0.0306
72	-	-	-	-	0.0270	-	-	-	-
73	-	-	-	-	0.0262	-	-	-	-
74	-	-	-	-	0.0236	-	-	-	-
75	-	-	-	-	0.0188	-	-	-	-
76	-	-	-	-	0.0170	-	-	-	-
77	-	-	-	-	0.0162	-	-	-	-
78	-	-	-	-	0.0158	-	-	-	-
79	1.0819	1.0819	1.0819	1.0819		0.0306	0.0306	0.0306	0.0306
80									
81									
82									
83	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
84	Grubbing/La	Grading	Drainage	Paving	PM10	Grubbing/Land Clear	Grading	Drainage	Paving
89	-	-	-	-	0.1653	-	-	-	-
90	-	-	-	-	0.1457	-	-	-	-
91	-	-	-	-	0.1295	-	-	-	-
92	-	-	-	-	0.1174	-	-	-	-
93	-	-	-	-	0.1074	-	-	-	-
94	-	-	-	-	0.0991	-	-	-	-
95	-	-	-	-	0.0959	-	-	-	-
96	-	-	-	-	0.0938	-	-	-	-
97	-	-	-	-	0.0926	-	-	-	-
98	2.3199	2.3199	2.3199	2.3199	0.0915	0.0915	0.0915	0.0915	0.0915
99	-	-	-	-	0.0909	-	-	-	-
100	-	-	-	-	0.0906	-	-	-	-
101	-	-	-	-	0.0906	-	-	-	-
102	-	-	-	-	0.0906	-	-	-	-
103	-	-	-	-	0.0906	-	-	-	-



	N	O	P	Q	R	S	T	U	V
193	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
194	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
199	-	-	-	-	0.2936	-	-	-	-
200	-	-	-	-	0.2833	-	-	-	-
201	-	-	-	-	0.2714	-	-	-	-
202	-	-	-	-	0.2511	-	-	-	-
203	-	-	-	-	0.2295	-	-	-	-
204	-	-	-	-	0.2076	-	-	-	-
205	-	-	-	-	0.1860	-	-	-	-
206	-	-	-	-	0.1648	-	-	-	-
207	-	-	-	-	0.1446	-	-	-	-
208	2.3785	2.3785	2.3785	2.3785	0.1259	0.1259	0.1259	0.1259	0.1259
209	-	-	-	-	0.1105	-	-	-	-
210	-	-	-	-	0.0975	-	-	-	-
211	-	-	-	-	0.0858	-	-	-	-
212	-	-	-	-	0.0749	-	-	-	-
213	-	-	-	-	0.0650	-	-	-	-
214	-	-	-	-	0.0557	-	-	-	-
215	-	-	-	-	0.0470	-	-	-	-
216	2.3785	2.3785	2.3785	2.3785		0.1259	0.1259	0.1259	0.1259
217									
218									
219									
220	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
221	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
226	-	-	-	-	0.1158	-	-	-	-
227	-	-	-	-	0.1142	-	-	-	-
228	-	-	-	-	0.1060	-	-	-	-
229	-	-	-	-	0.1050	-	-	-	-
230	-	-	-	-	0.0968	-	-	-	-
231	-	-	-	-	0.0874	-	-	-	-
232	-	-	-	-	0.0845	-	-	-	-
233	-	-	-	-	0.0767	-	-	-	-
234	-	-	-	-	0.0695	-	-	-	-
235	1.1165	1.1165	1.1165	1.1165	0.0541	0.0541	0.0541	0.0541	0.0541
236	-	-	-	-	0.0466	-	-	-	-
237	-	-	-	-	0.0421	-	-	-	-
238	-	-	-	-	0.0377	-	-	-	-
239	-	-	-	-	0.0310	-	-	-	-
240	-	-	-	-	0.0273	-	-	-	-
241	-	-	-	-	0.0249	-	-	-	-
242	-	-	-	-	0.0216	-	-	-	-
243	1.1165	1.1165	1.1165	1.1165		0.0541	0.0541	0.0541	0.0541
244									
245									
246									
247	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
248	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
253	-	-	-	-	0.1255	-	-	-	-
254	-	-	-	-	0.1255	-	-	-	-
255	-	-	-	-	0.1240	-	-	-	-
256	-	-	-	-	0.1246	-	-	-	-
257	-	-	-	-	0.1213	-	-	-	-
258	-	-	-	-	0.1153	-	-	-	-
259	-	-	-	-	0.1115	-	-	-	-
260	-	-	-	-	0.1046	-	-	-	-
261	-	-	-	-	0.0965	-	-	-	-
262	1.0081	1.0081	1.0081	1.0081	0.0804	0.0804	0.0804	0.0804	0.0804
263	-	-	-	-	0.0708	-	-	-	-
264	-	-	-	-	0.0619	-	-	-	-
265	-	-	-	-	0.0536	-	-	-	-
266	-	-	-	-	0.0447	-	-	-	-
267	-	-	-	-	0.0380	-	-	-	-
268	-	-	-	-	0.0327	-	-	-	-
269	-	-	-	-	0.0281	-	-	-	-
270	1.0081	1.0081	1.0081	1.0081		0.0804	0.0804	0.0804	0.0804
271									
272									
273									
274	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
275	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
280	-	-	-	-	0.3945	-	-	-	-
281	-	-	-	-	0.3790	-	-	-	-
282	-	-	-	-	0.3628	-	-	-	-
283	-	-	-	-	0.3393	-	-	-	-
284	-	-	-	-	0.3124	-	-	-	-
285	-	-	-	-	0.2845	-	-	-	-
286	-	-	-	-	0.2565	-	-	-	-
287	-	-	-	-	0.2365	-	-	-	-
288	-	-	-	-	0.2158	-	-	-	-
289	2.9540	2.9540	2.9540	2.9540	0.1943	0.1943	0.1943	0.1943	0.1943
290	-	-	-	-	0.1725	-	-	-	-
291	-	-	-	-	0.1543	-	-	-	-

	N	O	P	Q	R	S	T	U	V
292	-	-	-	-	0.1195	-	-	-	-
293	-	-	-	-	0.1056	-	-	-	-
294	-	-	-	-	0.0929	-	-	-	-
295	-	-	-	-	0.0812	-	-	-	-
296	-	-	-	-	0.0701	-	-	-	-
297	2.9540	2.9540	2.9540	2.9540		0.1943	0.1943	0.1943	0.1943
298									
299									
300									
301	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
302	Grubbing/L:	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
307	-	-	-	-	0.2005	-	-	-	-
308	-	-	-	-	0.2028	-	-	-	-
309	-	-	-	-	0.2021	-	-	-	-
310	-	-	-	-	0.2027	-	-	-	-
311	-	-	-	-	0.2024	-	-	-	-
312	-	-	-	-	0.1996	-	-	-	-
313	-	-	-	-	0.1985	-	-	-	-
314	-	-	-	-	0.1894	-	-	-	-
315	-	-	-	-	0.1759	-	-	-	-
316	2.6993	2.6993	2.6993	2.6993	0.1517	0.1517	0.1517	0.1517	0.1517
317	-	-	-	-	0.1375	-	-	-	-
318	-	-	-	-	0.1261	-	-	-	-
319	-	-	-	-	0.1103	-	-	-	-
320	-	-	-	-	0.0937	-	-	-	-
321	-	-	-	-	0.0798	-	-	-	-
322	-	-	-	-	0.0722	-	-	-	-
323	-	-	-	-	0.0622	-	-	-	-
324	2.6993	2.6993	2.6993	2.6993		0.1517	0.1517	0.1517	0.1517
325									
326									
327									
328	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
329	Grubbing/L:	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
334	-	-	-	-	0.1408	-	-	-	-
335	-	-	-	-	0.1404	-	-	-	-
336	-	-	-	-	0.1337	-	-	-	-
337	-	-	-	-	0.1304	-	-	-	-
338	-	-	-	-	0.1223	-	-	-	-
339	-	-	-	-	0.1122	-	-	-	-
340	-	-	-	-	0.1042	-	-	-	-
341	-	-	-	-	0.0997	-	-	-	-
342	-	-	-	-	0.0892	-	-	-	-
343	1.5232	1.5232	1.5232	1.5232	0.0765	0.0765	0.0765	0.0765	0.0765
344	-	-	-	-	0.0691	-	-	-	-
345	-	-	-	-	0.0611	-	-	-	-
346	-	-	-	-	0.0560	-	-	-	-
347	-	-	-	-	0.0467	-	-	-	-
348	-	-	-	-	0.0372	-	-	-	-
349	-	-	-	-	0.0311	-	-	-	-
350	-	-	-	-	0.0282	-	-	-	-
351	1.5232	1.5232	1.5232	1.5232		0.0765	0.0765	0.0765	0.0765
352									
353									
354									
355	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
356	Grubbing/L:	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
361	-	-	-	-	0.0802	-	-	-	-
362	-	-	-	-	0.0814	-	-	-	-
363	-	-	-	-	0.0801	-	-	-	-
364	-	-	-	-	0.0803	-	-	-	-
365	-	-	-	-	0.0751	-	-	-	-
366	-	-	-	-	0.0686	-	-	-	-
367	-	-	-	-	0.0661	-	-	-	-
368	-	-	-	-	0.0583	-	-	-	-
369	-	-	-	-	0.0520	-	-	-	-
370	1.1801	1.1801	1.1801	1.1801	0.0431	0.0431	0.0431	0.0431	0.0431
371	-	-	-	-	0.0371	-	-	-	-
372	-	-	-	-	0.0327	-	-	-	-
373	-	-	-	-	0.0274	-	-	-	-
374	-	-	-	-	0.0207	-	-	-	-
375	-	-	-	-	0.0183	-	-	-	-
376	-	-	-	-	0.0170	-	-	-	-
377	-	-	-	-	0.0145	-	-	-	-
378	1.1801	1.1801	1.1801	1.1801		0.0431	0.0431	0.0431	0.0431
379									
380									
381									
382	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
383	Grubbing/L:	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
388	-	-	-	-	0.1554	-	-	-	-
389	-	-	-	-	0.1577	-	-	-	-
390	-	-	-	-	0.1498	-	-	-	-

	N	O	P	Q	R	S	T	U	V
391	-	-	-	-	0.1507	-	-	-	-
392	-	-	-	-	0.1458	-	-	-	-
393	-	-	-	-	0.1384	-	-	-	-
394	-	-	-	-	0.1356	-	-	-	-
395	-	-	-	-	0.1271	-	-	-	-
396	-	-	-	-	0.1206	-	-	-	-
397	1.9752	1.9752	1.9752	1.9752	0.1039	0.1039	0.1039	0.1039	0.1039
398	-	-	-	-	0.0970	-	-	-	-
399	-	-	-	-	0.0901	-	-	-	-
400	-	-	-	-	0.0747	-	-	-	-
401	-	-	-	-	0.0649	-	-	-	-
402	-	-	-	-	0.0583	-	-	-	-
403	-	-	-	-	0.0540	-	-	-	-
404	-	-	-	-	0.0466	-	-	-	-
405	1.9752	1.9752	1.9752	1.9752		0.1039	0.1039	0.1039	0.1039
406									
407									
408									
409	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
410	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
415	-	-	-	-	0.2074	-	-	-	-
416	-	-	-	-	0.2088	-	-	-	-
417	-	-	-	-	0.2080	-	-	-	-
418	-	-	-	-	0.2091	-	-	-	-
419	-	-	-	-	0.2039	-	-	-	-
420	-	-	-	-	0.1961	-	-	-	-
421	-	-	-	-	0.1889	-	-	-	-
422	-	-	-	-	0.1769	-	-	-	-
423	-	-	-	-	0.1608	-	-	-	-
424	1.6930	1.6930	1.6930	1.6930	0.1338	0.1338	0.1338	0.1338	0.1338
425	-	-	-	-	0.1172	-	-	-	-
426	-	-	-	-	0.1011	-	-	-	-
427	-	-	-	-	0.0874	-	-	-	-
428	-	-	-	-	0.0680	-	-	-	-
429	-	-	-	-	0.0576	-	-	-	-
430	-	-	-	-	0.0499	-	-	-	-
431	-	-	-	-	0.0403	-	-	-	-
432	1.6930	1.6930	1.6930	1.6930		0.1338	0.1338	0.1338	0.1338
433									
434									
435									
436	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
437	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
442	-	-	-	-	0.1428	-	-	-	-
443	-	-	-	-	0.1441	-	-	-	-
444	-	-	-	-	0.1423	-	-	-	-
445	-	-	-	-	0.1409	-	-	-	-
446	-	-	-	-	0.1316	-	-	-	-
447	-	-	-	-	0.1236	-	-	-	-
448	-	-	-	-	0.1210	-	-	-	-
449	-	-	-	-	0.1105	-	-	-	-
450	-	-	-	-	0.0940	-	-	-	-
451	1.3173	1.3173	1.3173	1.3173	0.0682	0.0682	0.0682	0.0682	0.0682
452	-	-	-	-	0.0549	-	-	-	-
453	-	-	-	-	0.0467	-	-	-	-
454	-	-	-	-	0.0450	-	-	-	-
455	-	-	-	-	0.0406	-	-	-	-
456	-	-	-	-	0.0379	-	-	-	-
457	-	-	-	-	0.0348	-	-	-	-
458	-	-	-	-	0.0286	-	-	-	-
459	1.3173	1.3173	1.3173	1.3173		0.0682	0.0682	0.0682	0.0682
460									
461									
462									
463	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
468	-	-	-	-	0.1379	-	-	-	-
469	-	-	-	-	0.1400	-	-	-	-
470	-	-	-	-	0.1360	-	-	-	-
471	-	-	-	-	0.1368	-	-	-	-
472	-	-	-	-	0.1262	-	-	-	-
473	-	-	-	-	0.1192	-	-	-	-
474	-	-	-	-	0.1152	-	-	-	-
475	-	-	-	-	0.1006	-	-	-	-
476	-	-	-	-	0.0890	-	-	-	-
477	1.5566	1.5566	1.5566	1.5566	0.0761	0.0761	0.0761	0.0761	0.0761
478	-	-	-	-	0.0660	-	-	-	-
479	-	-	-	-	0.0589	-	-	-	-
480	-	-	-	-	0.0541	-	-	-	-
481	-	-	-	-	0.0430	-	-	-	-
482	-	-	-	-	0.0382	-	-	-	-
483	-	-	-	-	0.0351	-	-	-	-
484	-	-	-	-	0.0320	-	-	-	-
485	1.5566	1.5566	1.5566	1.5566		0.0761	0.0761	0.0761	0.0761

	N	O	P	Q	R	S	T	U	V
486									
487									
488									
489	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
490	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
495	-	-	-	-	0.1025	-	-	-	-
496	-	-	-	-	0.1046	-	-	-	-
497	-	-	-	-	0.1030	-	-	-	-
498	-	-	-	-	0.1031	-	-	-	-
499	-	-	-	-	0.0962	-	-	-	-
500	-	-	-	-	0.0884	-	-	-	-
501	-	-	-	-	0.0860	-	-	-	-
502	-	-	-	-	0.0762	-	-	-	-
503	-	-	-	-	0.0691	-	-	-	-
504	1.1264	1.1264	1.1264	1.1264	0.0551	0.0551	0.0551	0.0551	0.0551
505	-	-	-	-	0.0474	-	-	-	-
506	-	-	-	-	0.0454	-	-	-	-
507	-	-	-	-	0.0406	-	-	-	-
508	-	-	-	-	0.0359	-	-	-	-
509	-	-	-	-	0.0330	-	-	-	-
510	-	-	-	-	0.0306	-	-	-	-
511	-	-	-	-	0.0265	-	-	-	-
512	1.1264	1.1264	1.1264	1.1264		0.0551	0.0551	0.0551	0.0551
513									
514									
515									
516	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
517	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
522	-	-	-	-	0.1005	-	-	-	-
523	-	-	-	-	0.0855	-	-	-	-
524	-	-	-	-	0.0740	-	-	-	-
525	-	-	-	-	0.0711	-	-	-	-
526	-	-	-	-	0.0698	-	-	-	-
527	-	-	-	-	0.0694	-	-	-	-
528	-	-	-	-	0.0694	-	-	-	-
529	-	-	-	-	0.0695	-	-	-	-
530	-	-	-	-	0.0696	-	-	-	-
531	1.7814	1.7814	1.7814	1.7814	0.0696	0.0696	0.0696	0.0696	0.0696
532	-	-	-	-	0.0696	-	-	-	-
533	-	-	-	-	0.0696	-	-	-	-
534	-	-	-	-	0.0696	-	-	-	-
535	-	-	-	-	0.0696	-	-	-	-
536	-	-	-	-	0.0696	-	-	-	-
537	-	-	-	-	0.0696	-	-	-	-
538	-	-	-	-	0.0696	-	-	-	-
539	1.7814	1.7814	1.7814	1.7814		0.0696	0.0696	0.0696	0.0696
540									
541									
542									
543	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
544	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
549	-	-	-	-	0.1418	-	-	-	-
550	-	-	-	-	0.1350	-	-	-	-
551	-	-	-	-	0.1279	-	-	-	-
552	-	-	-	-	0.1201	-	-	-	-
553	-	-	-	-	0.1097	-	-	-	-
554	-	-	-	-	0.0995	-	-	-	-
555	-	-	-	-	0.0899	-	-	-	-
556	-	-	-	-	0.0833	-	-	-	-
557	-	-	-	-	0.0766	-	-	-	-
558	1.3034	1.3034	1.3034	1.3034	0.0697	0.0697	0.0697	0.0697	0.0697
559	-	-	-	-	0.0626	-	-	-	-
560	-	-	-	-	0.0561	-	-	-	-
561	-	-	-	-	0.0431	-	-	-	-
562	-	-	-	-	0.0375	-	-	-	-
563	-	-	-	-	0.0324	-	-	-	-
564	-	-	-	-	0.0283	-	-	-	-
565	-	-	-	-	0.0246	-	-	-	-
566	1.3034	1.3034	1.3034	1.3034		0.0697	0.0697	0.0697	0.0697
567									
568									
569									
570	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
571	Grubbing/Li	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
576	-	-	-	-	0.4106	-	-	-	-
577	-	-	-	-	0.3949	-	-	-	-
578	-	-	-	-	0.3784	-	-	-	-
579	-	-	-	-	0.3542	-	-	-	-
580	-	-	-	-	0.3266	-	-	-	-
581	-	-	-	-	0.2978	-	-	-	-
582	-	-	-	-	0.2688	-	-	-	-
583	-	-	-	-	0.2481	-	-	-	-
584	-	-	-	-	0.2266	-	-	-	-

	N	O	P	Q	R	S	T	U	V
585	2.9995	2.9995	2.9995	2.9995	0.2043	0.2043	0.2043	0.2043	0.2043
586	-	-	-	-	0.1816	-	-	-	-
587	-	-	-	-	0.1625	-	-	-	-
588	-	-	-	-	0.1259	-	-	-	-
589	-	-	-	-	0.1114	-	-	-	-
590	-	-	-	-	0.0980	-	-	-	-
591	-	-	-	-	0.0858	-	-	-	-
592	-	-	-	-	0.0741	-	-	-	-
593	2.9995	2.9995	2.9995	2.9995		0.2043	0.2043	0.2043	0.2043
594									
595									
596									
597	Weighted	Weighted	Weighted	Weighted		Weighted	Weighted	Weighted	Weighted
598	Grubbing/L:	Grading	Drainage	Paving	PM10	Grubbing/Land Clea	Grading	Drainage	Paving
603	-	-	-	-	0.2097	-	-	-	-
604	-	-	-	-	0.2102	-	-	-	-
605	-	-	-	-	0.2001	-	-	-	-
606	-	-	-	-	0.2003	-	-	-	-
607	-	-	-	-	0.1891	-	-	-	-
608	-	-	-	-	0.1785	-	-	-	-
609	-	-	-	-	0.1754	-	-	-	-
610	-	-	-	-	0.1604	-	-	-	-

Equipment	Fuel	HP	Life	Pop	Base	Avg HP	Load	Total HP
Aerial Lifts	D	50	16	100	2010	46	0.3082	4614.596
Aerial Lifts	D	120	16	121	2010	74	0.3082	8973.642
Aerial Lifts	D	175	16	4	2010	130	0.3082	548.411
Aerial Lifts	D	250	16	0	2010	210	0.3082	19.83574
Aerial Lifts	D	500	16	0	2010	380	0.3082	35.89325
Air Compressors	D	15	16	52	2000	12	0.48	624
Air Compressors	D	25	16	103	2000	24	0.48	2472
Air Compressors	D	50	16	936	2000	37	0.48	34632
Air Compressors	D	120	16	6234	2000	78	0.48	486252
Air Compressors	D	175	16	236	2000	147	0.48	34692
Air Compressors	D	250	16	332	2000	218	0.48	72376
Air Compressors	D	500	16	433	2000	385	0.48	166705
Air Compressors	D	750	16	162	2000	595	0.48	96390
Air Compressors	D	1000	16	4	2000	808	0.48	3232
Bore/Drill Rigs	D	50	10	7	2000	39	0.5025	289.4177
Bore/Drill Rigs	D	120	10	23	2000	82	0.5025	1858.448
Bore/Drill Rigs	D	175	10	18	2000	149	0.5025	2627.022
Bore/Drill Rigs	D	250	10	18	2000	208	0.5025	3658.252
Bore/Drill Rigs	D	500	10	12	2000	349	0.5025	4306.746
Bore/Drill Rigs	D	750	10	6	2000	612	0.5025	3750.174
Bore/Drill Rigs	D	1000	10	0	2000	919	0.5025	213.8634
Bore/Drill Rigs	D	9999	10	0	2000	2667	0.5025	620.5686
Cement and Mortar Mixers	D	15	7	511	2000	9	0.56	4599
Cement and Mortar Mixers	D	25	14	46	2000	25	0.56	1150
Concrete/Industrial Saws	D	25	5	4	2000	18	0.73	72
Concrete/Industrial Saws	D	50	16	35	2000	33	0.73	1155
Concrete/Industrial Saws	D	120	16	61	2000	81	0.73	4941
Concrete/Industrial Saws	D	175	16	2	2000	175	0.73	350
Cranes	D	50	19	3	2010	41	0.2881	138.6843
Cranes	D	120	19	41	2010	89	0.2881	3660.701
Cranes	D	175	19	62	2010	148	0.2881	9129.662
Cranes	D	250	19	69	2010	217	0.2881	15047.25
Cranes	D	500	19	67	2010	336	0.2881	22355.78
Cranes	D	750	19	10	2010	567	0.2881	5531.672
Cranes	D	1000	19	1	2010	938	0.2881	1371.629
Cranes	D	9999	19	0	2010	1030	0.2881	100.4535
Crawler Tractors	D	50	29	9	2010	43	0.4288	367.9703
Crawler Tractors	D	120	29	149	2010	87	0.4288	12939.21
Crawler Tractors	D	175	29	97	2010	150	0.4288	14575.55
Crawler Tractors	D	250	29	71	2010	203	0.4288	14450.64
Crawler Tractors	D	500	29	115	2010	341	0.4288	39016.1
Crawler Tractors	D	750	29	23	2010	570	0.4288	13373.74
Crawler Tractors	D	1000	29	2	2010	828	0.4288	1720.484
Crawler Tractors	D	9999	29	1	2010	1527	0.4288	792.811
Crushing/Proc. Equipment	D	50	16	160	2000	45	0.78	7200
Crushing/Proc. Equipment	D	120	16	451	2000	85	0.78	38335
Crushing/Proc. Equipment	D	175	16	191	2000	171	0.78	32661
Crushing/Proc. Equipment	D	250	16	19	2000	250	0.78	4750
Crushing/Proc. Equipment	D	500	16	107	2000	382	0.78	40874
Crushing/Proc. Equipment	D	750	16	5	2000	602	0.78	3010
Crushing/Proc. Equipment	D	9999	16	5	2000	1337	0.78	6685
Excavators	D	50	17	212	2010	36	0.3819	7576.74
Excavators	D	120	17	153	2010	82	0.3819	12539.96
Excavators	D	175	17	195	2010	146	0.3819	28452.26
Excavators	D	250	17	167	2010	218	0.3819	36591.6
Excavators	D	500	17	170	2010	329	0.3819	55985.07
Excavators	D	750	17	9	2010	578	0.3819	5015.463
Excavators	D	1000	17	1	2010	843	0.3819	585.1692
Excavators	D	9999	17	1	2010	1569	0.3819	953.2106
Forklifts	D	50	12	46	2010	42	0.201	1967.167
Forklifts	D	120	12	310	2010	82	0.201	25509.73
Forklifts	D	175	12	57	2010	141	0.201	8118.648
Forklifts	D	250	12	8	2010	208	0.201	1715.579
Forklifts	D	500	12	1	2010	344	0.201	513.8725



Forklifts	D	1000	12	0	2010	880	0.201	33.73426
Generator Sets	D	15	16	5086	2000	11	0.74	55946
Generator Sets	D	25	16	3720	2000	19	0.74	70680
Generator Sets	D	50	16	4543	2000	33	0.74	149919
Generator Sets	D	120	16	6903	2000	84	0.74	579852
Generator Sets	D	175	16	408	2000	153	0.74	62424
Generator Sets	D	250	16	228	2000	229	0.74	52212
Generator Sets	D	500	16	507	2000	363	0.74	184041
Generator Sets	D	750	16	315	2000	586	0.74	184590
Generator Sets	D	9999	16	82	2000	1130	0.74	92660
Graders	D	50	23	3	2010	39	0.4087	105.8898
Graders	D	120	23	29	2010	91	0.4087	2619.246
Graders	D	175	23	135	2010	148	0.4087	19924.55
Graders	D	250	23	107	2010	204	0.4087	21852.81
Graders	D	500	23	20	2010	293	0.4087	5855.863
Graders	D	1000	23	0	2010	796	0.4087	69.43021
Graders	D	9999	23	0	2010	1993	0.4087	869.0988
Off-Highway Tractors	D	50	31	81	2010	38	0.4355	3058.346
Off-Highway Tractors	D	120	31	59	2010	75	0.4355	4400.544
Off-Highway Tractors	D	175	31	22	2010	158	0.4355	3544.053
Off-Highway Tractors	D	250	31	15	2010	214	0.4355	3129.114
Off-Highway Tractors	D	500	31	25	2010	334	0.4355	8413.79
Off-Highway Tractors	D	750	31	4	2010	574	0.4355	2110.379
Off-Highway Tractors	D	1000	31	0	2010	1000	0.4355	85.57209
Off-Highway Tractors	D	9999	31	0	2010	1726	0.4355	590.8752
Off-Highway Trucks	D	50	17	5	2010	29	0.3819	140.8353
Off-Highway Trucks	D	120	17	3	2010	87	0.3819	236.2235
Off-Highway Trucks	D	175	17	26	2010	159	0.3819	4122.464
Off-Highway Trucks	D	250	17	44	2010	211	0.3819	9375.342
Off-Highway Trucks	D	500	17	99	2010	372	0.3819	36755.73
Off-Highway Trucks	D	750	17	23	2010	656	0.3819	14793.56
Off-Highway Trucks	D	1000	17	10	2010	897	0.3819	9281.226
Off-Highway Trucks	D	9999	17	7	2010	1764	0.3819	11817.19
Other Construction Equipment	D	50	16	63	2010	38	0.4154	2383.482
Other Construction Equipment	D	120	16	111	2010	82	0.4154	9025.141
Other Construction Equipment	D	175	16	34	2010	152	0.4154	5251.274
Other Construction Equipment	D	250	16	31	2010	217	0.4154	6700.573
Other Construction Equipment	D	500	16	60	2010	357	0.4154	21415.72
Other Construction Equipment	D	750	16	12	2010	598	0.4154	7415.559
Other Construction Equipment	D	1000	16	1	2010	830	0.4154	910.887
Other Construction Equipment	D	9999	16	1	2010	1127	0.4154	570.5704
Other General Industrial Equipmen	D	50	16	62	2010	35	0.3417	2172.079
Other General Industrial Equipmen	D	120	16	27	2010	73	0.3417	1987.832
Other General Industrial Equipmen	D	175	16	6	2010	149	0.3417	890.0775
Other General Industrial Equipmen	D	250	16	4	2010	209	0.3417	843.524
Other General Industrial Equipmen	D	500	16	7	2010	355	0.3417	2501.616
Other General Industrial Equipmen	D	750	16	2	2010	592	0.3417	922.6276
Other General Industrial Equipmen	D	1000	16	0	2010	885	0.3417	90.02155
Other General Industrial Equipmen	D	9999	16	0	2010	2000	0.3417	67.81284
Other Material Handling Equipment	D	50	16	3	2010	36	0.3953	98.19676
Other Material Handling Equipment	D	120	16	14	2010	93	0.3953	1286.811
Other Material Handling Equipment	D	175	16	5	2010	145	0.3953	738.3328
Other Material Handling Equipment	D	250	16	4	2010	218	0.3953	886.7887
Other Material Handling Equipment	D	500	16	6	2010	331	0.3953	2025.685
Other Material Handling Equipment	D	750	16	0	2010	565	0.3953	262.1289
Other Material Handling Equipment	D	1000	16	0	2010	923	0.3953	35.71143
Other Material Handling Equipment	D	9999	16	0	2010	1050	0.3953	81.25027
Pavers	D	50	26	10	2010	39	0.4154	392.6077
Pavers	D	120	26	49	2010	80	0.4154	3930.058
Pavers	D	175	26	33	2010	158	0.4154	5277.545
Pavers	D	250	26	14	2010	213	0.4154	3070.218
Pavers	D	500	26	4	2010	327	0.4154	1164.694
Pavers	D	750	26	0	2010	750	0.4154	127.0575
Paving Equipment	D	50	24	13	2010	35	0.3551	435.783
Paving Equipment	D	120	24	26	2010	89	0.3551	2262.807
Paving Equipment	D	175	24	14	2010	148	0.3551	2070.836
Paving Equipment	D	250	24	5	2010	216	0.3551	1094.32
Paving Equipment	D	500	24	5	2010	339	0.3551	1547.017
Paving Equipment	D	750	24	1	2010	605	0.3551	665.1335

Paving Equipment	D	1000	24	0	2010	842	0.3551	142.4138
Plate Compactors	D	15	4	322	2000	8	0.43	2576
Pressure Washers	D	15	16	236	2000	13	0.3	3068
Pressure Washers	D	25	16	55	2000	19	0.3	1045
Pressure Washers	D	50	16	109	2000	38	0.3	4142
Pressure Washers	D	120	16	45	2000	64	0.3	2880
Pressure Washers	D	175	16	3	2000	152	0.6	456
Pressure Washers	D	250	3	1	2000	191	0.6	191
Pumps	D	15	16	3820	2000	8	0.74	30560
Pumps	D	25	16	1141	2000	21	0.74	23961
Pumps	D	50	16	1989	2000	37	0.74	73593
Pumps	D	120	16	3900	2000	84	0.74	327600
Pumps	D	175	16	422	2000	151	0.74	63722
Pumps	D	250	16	304	2000	217	0.74	65968
Pumps	D	500	16	6	2000	372	0.74	2232
Pumps	D	750	16	1	2000	615	0.74	615
Pumps	D	9999	16	22	2000	1460	0.74	32120
Rollers	D	50	20	257	2010	36	0.3752	9162.281
Rollers	D	120	20	192	2010	87	0.3752	16635.08
Rollers	D	175	20	111	2010	144	0.3752	15920.48
Rollers	D	250	20	14	2010	213	0.3752	2895.922
Rollers	D	500	20	6	2010	335	0.3752	1865.675
Rollers	D	750	20	0	2010	521	0.3752	90.61998
Rough Terrain Forklifts	D	50	16	12	2010	47	0.402	551.5141
Rough Terrain Forklifts	D	120	16	500	2010	96	0.402	48137.78
Rough Terrain Forklifts	D	175	16	67	2010	130	0.402	8665.157
Rough Terrain Forklifts	D	250	16	4	2010	208	0.402	816.8643
Rough Terrain Forklifts	D	500	16	1	2010	374	0.402	338.3491
Rough Terrain Forklifts	D	750	16	0	2010	625	0.402	62.84345
Rubber Tired Dozers	D	50	32	3	2010	42	0.3953	141.3369
Rubber Tired Dozers	D	120	32	10	2010	82	0.3953	825.1424
Rubber Tired Dozers	D	175	32	5	2010	150	0.3953	781.7052
Rubber Tired Dozers	D	250	32	4	2010	211	0.3953	856.9743
Rubber Tired Dozers	D	500	32	27	2010	354	0.3953	9597.234
Rubber Tired Dozers	D	750	32	2	2010	584	0.3953	968.386
Rubber Tired Loaders	D	50	21	13	2010	42	0.3618	533.1886
Rubber Tired Loaders	D	120	21	159	2010	86	0.3618	13695.71
Rubber Tired Loaders	D	175	21	208	2010	150	0.3618	31246.78
Rubber Tired Loaders	D	250	21	185	2010	206	0.3618	38125.44
Rubber Tired Loaders	D	500	21	172	2010	320	0.3618	54995.23
Rubber Tired Loaders	D	750	21	15	2010	600	0.3618	9131.34
Rubber Tired Loaders	D	1000	21	3	2010	837	0.3618	2313.681
Rubber Tired Loaders	D	9999	21	1	2010	1521	0.3618	919.9252
Scrapers	D	50	26	1	2010	36	0.4824	21.60502
Scrapers	D	120	26	9	2010	84	0.4824	727.312
Scrapers	D	175	26	55	2010	166	0.4824	9209.117
Scrapers	D	250	26	54	2010	225	0.4824	12103.34
Scrapers	D	500	26	236	2010	381	0.4824	90173.71
Scrapers	D	750	26	67	2010	565	0.4824	38064.62
Scrapers	D	1000	26	1	2010	950	0.4824	1054.632
Scrapers	D	9999	26	1	2010	1923	0.4824	2135.139
Signal Boards	D	15	2	2815	2000	6	0.82	16890
Signal Boards	D	50	16	14	2000	37	0.78	518
Signal Boards	D	120	16	229	2000	82	0.78	18778
Signal Boards	D	175	16	142	2000	158	0.78	22436
Signal Boards	D	250	16	30	2000	216	0.78	6480
Skid Steer Loaders	D	50	13	178	2010	43	0.3685	7733.408
Skid Steer Loaders	D	120	13	574	2010	71	0.3685	40495.5
Skid Steer Loaders	D	175	13	2	2010	153	0.3685	364.1918
Skid Steer Loaders	D	250	13	1	2010	201	0.3685	265.3158
Skid Steer Loaders	D	500	13	0	2010	277	0.3685	73.20881
Skid Steer Loaders	D	750	13	0	2010	530	0.3685	46.74779
Skid Steer Loaders	D	1000	13	0	2010	1000	0.3685	176.4068
Surfacing Equipment	D	50	22	3	2010	36	0.3015	111.306
Surfacing Equipment	D	120	22	10	2010	89	0.3015	887.0073
Surfacing Equipment	D	175	22	3	2010	151	0.3015	507.3986
Surfacing Equipment	D	250	22	5	2010	216	0.3015	1089.215
Surfacing Equipment	D	500	22	8	2010	362	0.3015	3015.505
Surfacing Equipment	D	750	22	4	2010	615	0.3015	2559.318

Surfacing Equipment	D	1000	22	1	2010	814	0.3015	456.1066
Surfacing Equipment	D	9999	22	0	2010	1141	0.3015	182.6027
Sweepers/Scrubbers	D	50	13	48	2010	36	0.4556	1705.372
Sweepers/Scrubbers	D	120	13	39	2010	78	0.4556	3024.817
Sweepers/Scrubbers	D	175	13	4	2010	159	0.4556	716.8907
Sweepers/Scrubbers	D	250	13	2	2010	204	0.4556	381.4313
Sweepers/Scrubbers	D	500	13	0	2010	303	0.4556	102.6311
Sweepers/Scrubbers	D	1000	13	0	2010	848	0.4556	71.92656
Tractors/Loaders/Backhoes	D	50	18	249	2010	38	0.3685	9536.711
Tractors/Loaders/Backhoes	D	120	18	1690	2010	83	0.3685	139717
Tractors/Loaders/Backhoes	D	175	18	189	2010	144	0.3685	27219.48
Tractors/Loaders/Backhoes	D	250	18	76	2010	204	0.3685	15447.88
Tractors/Loaders/Backhoes	D	500	18	68	2010	320	0.3685	21856.12
Tractors/Loaders/Backhoes	D	750	18	5	2010	575	0.3685	2741.579
Tractors/Loaders/Backhoes	D	1000	18	0	2010	871	0.3685	377.9604
Tractors/Loaders/Backhoes	D	9999	18	3	2010	2006	0.3685	6437.384
Trenchers	D	50	18	82	2010	40	0.5025	3247.6
Trenchers	D	120	28	38	2010	82	0.5025	3106.114
Trenchers	D	175	28	5	2010	144	0.5025	720.7921
Trenchers	D	250	28	6	2010	218	0.5025	1296.943
Trenchers	D	500	28	5	2010	359	0.5025	1929.225
Trenchers	D	750	28	1	2010	619	0.5025	689.4331
Trenchers	D	1000	28	0	2010	860	0.5025	79.78906
Welder	D	50	16	21	2000	35	0.6	735
Welder	D	120	16	58	2000	62	0.6	3596
Welders	D	15	16	1727	2000	11	0.45	18997
Welders	D	25	16	1520	2000	20	0.45	30400
Welders	D	50	16	4678	2000	46	0.45	215188
Welders	D	120	16	3633	2000	70	0.45	254310
Welders	D	175	16	18	2000	174	0.45	3132
Welders	D	250	16	4	2000	211	0.45	844
Welders	D	500	16	10	2000	297	0.45	2970















Avg HP by  
Equipment Type

62.9

105.7

205.8

10.3

63.9

226.2

208.3

142.3

162.7

89.4

65.7

174.7

122.6

400.2

171.6

87.9

167.0

125.7

130.6

8.0

26.2

53.5

80.5

100.4

255.4

199.7

361.6

20.2

65.0

253.6

64.0

97.9

80.8

45.4



g/Land Clearing

g/Land Clearing

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**Sacramento Valley Air Basin Fleet Average Emission Factors (Diesel)**

**2005**

2005 data has not been updated and not used in this model  
 (OFFROAD2007 rows were added or deleted to match OFFROAD2011 HP categories)

AvgHP		2005		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
		Equipment	MaxHP	ROG	CO	NOX	SOX
0	46	Aerial Lifts	50	0.135	0.546	0.885	0.012
50	74		120	0.181	0.444	0.704	0.008
120	130		175	0.321	0.726	0.733	0.008
175	210		250	0.192	0.562	1.159	0.009
250	380		500	0.243	1.010	2.880	0.023
0	12	Air Compressors	15	0.661	2.092	3.722	0.040
15	24		25	0.767	1.862	2.879	0.032
25	37		50	1.678	3.643	3.081	0.033
50	78		120	0.722	2.008	4.121	0.030
120	147		175	0.472	1.598	3.769	0.029
175	218		250	0.336	0.942	3.556	0.029
250	385		500	0.297	1.227	3.264	0.025
500	595		750	0.304	1.227	3.341	0.026
750	808		1000	0.367	1.485	3.835	0.026
0	39	Bore/Drill Rigs	50	0.161	0.730	1.099	0.017
50	82		120	0.142	0.409	0.839	0.010
120	149		175	0.406	0.984	0.950	0.011
175	208		250	0.350	1.130	2.044	0.018
250	349		500	0.234	0.979	2.016	0.019
500	612		750	0.097	0.269	1.424	0.015
750	919		1000	0.090	0.289	1.366	0.014
1000	2667		9999	0.065	0.197	0.985	0.010
0	9	Cement and Mortar Mixer	15	0.561	2.124	3.530	0.046
15	25		25	0.866	2.118	3.341	0.038
0	18	Concrete/Industrial Saws	25	0.621	1.840	3.888	0.049
25	33		50	2.319	5.104	4.615	0.050
50	81		120	1.043	2.958	6.133	0.045
120	175		175	0.682	2.354	5.612	0.044
0	41	Cranes	50	1.908	4.046	3.066	0.031
50	89		120	0.758	2.021	4.207	0.028
120	148		175	0.480	1.560	3.702	0.026
175	217		250	0.349	0.974	3.365	0.025
250	336		500	0.320	1.401	3.180	0.022
500	567		750	0.324	1.397	3.239	0.023
750	938		1000	0.000	0.000	0.000	0.000
1000	1030		9999	0.630	2.790	6.391	0.040
0	43	Crawler Tractors	50	2.017	4.257	3.178	0.032
50	87		120	1.063	2.798	5.888	0.038
120	150		175	0.752	2.423	5.743	0.039
175	203		250	0.593	1.665	5.565	0.039
250	341		500	0.487	2.384	4.721	0.032
500	570		750	0.528	2.554	5.156	0.035
750	828		1000	0.000	0.000	0.000	0.000

1000	1527		9999	0.306	1.495	3.027	0.018
0	45	Crushing/Proc. Equipmen	50	2.856	6.163	5.054	0.054
50	85		120	1.202	3.309	6.771	0.049
120	171		175	0.787	2.631	6.197	0.047
175	250		250	0.555	1.534	5.839	0.047
250	382		500	0.490	1.985	5.338	0.041
500	602		750	0.493	1.895	5.443	0.042
750	1337		9999	0.602	2.371	6.284	0.042
0	16	Dumpers/Tenders	25	0.494	1.267	2.183	0.026
0	36	Excavators	50	0.286	0.880	1.916	0.025
50	82		120	0.970	2.098	1.602	0.017
120	146		175	0.637	1.752	3.472	0.025
175	218		250	0.424	1.415	3.241	0.024
250	329		500	0.273	0.728	2.873	0.023
500	578		750	0.203	0.706	2.155	0.017
750	843		1000	0.000	0.000	0.000	0.000
1000	1569		9999	0.126	0.431	1.357	0.011
0	42	Forklifts	50	1.117	2.396	1.818	0.019
50	82		120	0.483	1.311	2.583	0.019
120	141		175	0.332	1.079	2.493	0.019
175	208		250	0.194	0.494	2.161	0.018
250	344		500	0.000	0.000	0.000	0.000
500	880		1000	0.058	0.179	0.658	0.005
0	11	Generator Sets	15	0.888	3.225	5.593	0.061
15	19		25	0.917	2.871	4.438	0.050
25	33		50	1.907	4.345	4.497	0.051
50	84		120	0.965	2.845	5.875	0.046
120	153		175	0.626	2.266	5.372	0.044
175	229		250	0.441	1.316	5.067	0.044
250	363		500	0.397	1.607	4.741	0.039
500	586		750	0.409	1.607	4.854	0.040
750	1130		9999	0.524	1.976	5.582	0.040
0	39	Graders	50	2.239	4.798	3.709	0.038
50	91		120	1.067	2.897	5.925	0.041
120	148		175	0.711	2.354	5.505	0.040
175	204		250	0.526	1.454	5.264	0.040
250	293		500	0.431	1.813	4.438	0.033
500	796		1000	0.000	0.000	0.000	0.000
1000	1993		9999	0.137	0.564	1.417	0.010
0	38	Off-Highway Tractors	50	3.692	9.530	20.585	0.124
50	75		120	1.739	5.502	13.223	0.083
120	158		175	0.674	1.918	6.023	0.039
175	214		250	1.933	10.554	18.102	0.113
250	334		500	0.000	0.000	0.000	0.000
500	574		750	0.000	0.000	0.000	0.000
750	1000		1000	0.000	0.000	0.000	0.000
1000	1726		9999	0.367	2.015	3.495	0.020
0	29	Off-Highway Trucks	50	3.689	12.100	27.758	0.204
50	87		120	1.142	3.013	11.682	0.091
120	159		175	0.915	3.182	9.358	0.071
175	211		250	1.130	3.886	11.783	0.089
250	372		500	0.000	0.000	0.000	0.000

500	656		750	0.000	0.000	0.000	0.000
750	897		1000	0.000	0.000	0.000	0.000
1000	1764		9999	0.218	0.793	2.310	0.015
0	38	Other Construction Equip	50	0.163	0.737	1.110	0.018
50	82		120	0.119	0.342	0.700	0.009
120	152		175	0.467	1.039	0.912	0.010
175	217		250	0.416	1.203	2.399	0.019
250	357		500	0.215	0.764	1.758	0.014
500	598		750	0.000	0.000	0.000	0.000
750	830		1000	0.000	0.000	0.000	0.000
1000	1127		9999	0.099	0.368	1.139	0.009
0	35	Other General Industrial E	50	0.103	0.505	0.724	0.012
50	73		120	0.126	0.401	0.874	0.011
120	149		175	0.472	1.006	0.772	0.008
175	209		250	0.386	1.041	2.121	0.015
250	355		500	0.231	0.755	1.768	0.013
500	592		750	0.137	0.371	1.411	0.011
750	885		1000	0.158	0.628	1.676	0.012
1000	2000		9999	0.117	0.458	1.252	0.009
0	36	Other Material Handling E	50	2.703	5.777	4.476	0.046
50	93		120	0.840	2.272	4.634	0.032
120	145		175	0.714	2.343	5.494	0.040
175	218		250	0.394	1.072	4.073	0.032
250	331		500	0.303	1.209	3.221	0.024
500	565		750	0.000	0.000	0.000	0.000
750	923		1000	0.000	0.000	0.000	0.000
1000	1050		9999	0.446	1.797	4.634	0.029
0	39	Pavers	50	0.534	1.346	2.243	0.026
50	80		120	1.156	2.444	1.892	0.019
120	158		175	0.605	1.600	3.417	0.022
175	213		250	0.551	1.790	4.280	0.029
250	327		500	0.439	1.257	4.066	0.028
500	750		750	0.203	1.058	1.959	0.013
0	35	Paving Equipment	50	0.266	0.765	1.567	0.019
50	89		120	0.877	1.856	1.450	0.015
120	148		175	0.504	1.335	2.855	0.018
175	216		250	0.424	1.384	3.314	0.022
250	339		500	0.000	0.000	0.000	0.000
500	605		750	0.000	0.000	0.000	0.000
750	842		1000	0.107	0.307	0.990	0.007
0	8	Plate Compactors	15	0.344	1.508	2.338	0.036
0	13	Pressure Washers	15	0.360	1.307	2.267	0.025
15	19		25	0.372	1.164	1.799	0.020
25	38		50	0.640	1.513	1.774	0.021
50	64		120	0.361	1.103	2.283	0.019
0	8	Pumps	15	1.019	3.225	5.738	0.061
15	21		25	1.183	2.871	4.438	0.050
25	37		50	2.018	4.551	4.538	0.051
50	84		120	0.990	2.887	5.957	0.046
120	151		175	0.643	2.299	5.446	0.044
175	217		250	0.455	1.341	5.138	0.044
250	372		500	0.407	1.689	4.791	0.039

500	615		750	0.419	1.689	4.905	0.040
750	1460		9999	0.532	2.061	5.638	0.040
0	36	Rollers	50	0.108	0.491	0.739	0.012
50	87		120	0.113	0.324	0.664	0.008
120	144		175	0.525	1.133	0.938	0.010
175	213		250	0.345	0.946	1.977	0.014
250	335		500	0.264	0.886	2.107	0.015
500	521		750	0.185	0.530	1.835	0.014
0	47	Rough Terrain Forklifts	50	2.192	4.730	3.729	0.039
50	96		120	0.805	2.219	4.487	0.032
120	130		175	0.782	2.617	6.107	0.046
175	208		250	0.476	1.303	4.919	0.039
250	374		500	0.000	0.000	0.000	0.000
500	625		750	0.210	0.786	2.232	0.017
0	42	Rubber Tired Dozers	50	3.197	9.998	23.997	0.148
50	82		120	1.896	5.347	16.751	0.107
120	150		175	1.320	7.252	12.083	0.074
175	211		250	1.419	7.746	13.107	0.080
250	354		500	0.000	0.000	0.000	0.000
500	584		750	0.806	4.454	7.631	0.043
0	42	Rubber Tired Loaders	50	0.275	0.816	1.725	0.022
50	86		120	1.138	2.442	1.901	0.020
120	150		175	0.504	1.372	2.804	0.020
175	206		250	0.434	1.440	3.371	0.025
250	320		500	0.287	0.795	2.892	0.022
500	600		750	0.215	0.890	2.222	0.016
750	837		1000	0.321	1.308	3.350	0.025
1000	1521		9999	0.246	1.019	2.564	0.017
0	36	Scrapers	50	3.654	9.609	20.309	0.129
50	84		120	1.634	5.266	12.511	0.084
120	166		175	0.925	2.610	8.623	0.060
175	225		250	0.926	4.620	8.938	0.059
250	381		500	0.000	0.000	0.000	0.000
500	565		750	0.000	0.000	0.000	0.000
750	950		1000	0.000	0.000	0.000	0.000
1000	1923		9999	0.189	0.934	1.840	0.012
0	6	Signal Boards	15	0.609	2.848	4.088	0.068
15	37		50	2.341	5.197	4.859	0.054
50	82		120	1.091	3.122	6.423	0.049
120	158		175	0.711	2.486	5.875	0.047
175	216		250	0.607	1.749	6.693	0.056
0	43	Skid Steer Loaders	50	0.380	0.938	1.497	0.017
50	71		120	0.873	1.981	1.752	0.020
120	153		175	0.000	0.000	0.000	0.000
175	201		250	0.000	0.000	0.000	0.000
250	277		500	0.000	0.000	0.000	0.000
500	530		750	0.000	0.000	0.000	0.000
750	1000		1000	0.046	0.136	0.261	0.002
0	36	Surfacing Equipment	50	0.993	2.187	1.993	0.022
50	89		120	0.837	2.365	4.951	0.036
120	151		175	0.432	1.503	3.568	0.027
175	216		250	0.363	1.073	3.747	0.030

250	362		500	0.316	1.467	3.399	0.025
500	615		750	0.000	0.000	0.000	0.000
750	814		1000	0.000	0.000	0.000	0.000
1000	1141		9999	0.161	0.731	1.731	0.013
0	36	Sweepers/Scrubbers	50	0.189	0.929	1.334	0.022
50	78		120	0.156	0.509	1.075	0.014
120	159		175	0.597	1.286	1.023	0.011
175	204		250	0.452	1.241	2.481	0.018
250	303		500	0.370	1.223	2.853	0.022
500	848		1000	0.100	0.265	1.106	0.009
0	38	Tractors/Loaders/Backho	50	0.393	1.036	1.867	0.022
50	83		120	1.074	2.348	1.876	0.020
120	144		175	0.430	1.210	2.387	0.018
175	204		250	0.386	1.324	3.023	0.024
250	320		500	0.282	0.758	3.074	0.026
500	575		750	0.278	0.952	3.086	0.029
750	871		1000	0.000	0.000	0.000	0.000
1000	2006		9999	0.122	0.409	1.370	0.012
0	40	Trenchers	50	0.126	0.589	0.846	0.014
50	82		120	0.272	0.807	1.704	0.022
120	144		175	0.715	1.518	1.218	0.013
175	218		250	0.402	1.072	2.303	0.015
250	359		500	0.360	1.183	2.835	0.019
500	619		750	0.263	0.764	2.451	0.017
750	860		1000	0.234	1.264	2.278	0.015
0	11	Welders	15	0.620	1.961	3.489	0.037
15	20		25	0.720	1.746	2.699	0.030
25	46		50	1.449	3.183	2.842	0.031
50	70		120	0.651	1.838	3.781	0.028
120	174		175	0.424	1.463	3.456	0.027
175	211		250	0.302	0.862	3.262	0.027
250	297		500	0.268	1.135	3.010	0.023
0	29	Water Trucks	50	3.689	12.100	27.758	0.204
50	87		120	1.142	3.013	11.682	0.091
120	159		175	0.915	3.182	9.358	0.071
175	211		250	1.130	3.886	11.783	0.089
250	372		500	0.000	0.000	0.000	0.000
500	656		750	0.000	0.000	0.000	0.000
750	897		1000	0.000	0.000	0.000	0.000
1000	1764		9999	0.218	0.793	2.310	0.015

2016

AvgHP

0

50

2016		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
Equipment	MaxHP	ROG	CO	NOX	SOX
Aerial Lifts	50	0.073	0.866	1.133	0.002
	120	0.053	0.778	0.839	0.002



120	130		175	0.048	0.778	0.606	0.002
175	210		250	0.355	0.778	3.652	0.002
250	380		500	0.078	0.778	1.430	0.002
0	12	Air Compressors	15	0.389	1.739	2.419	0.004
15	24		25	0.411	1.250	2.311	0.003
25	37		50	0.824	2.817	2.455	0.004
50	78		120	0.367	1.837	2.353	0.003
120	147		175	0.258	1.549	2.003	0.003
175	218		250	0.177	0.570	1.758	0.003
250	385		500	0.166	0.557	1.521	0.003
500	595		750	0.167	0.557	1.582	0.003
750	808		1000	0.189	0.624	2.373	0.003
0	39	Bore/Drill Rigs	50	0.457	1.208	2.662	0.003
50	82		120	0.161	1.026	1.920	0.002
120	149		175	0.150	1.067	1.817	0.003
175	208		250	0.101	1.047	1.458	0.002
250	349		500	0.090	1.032	1.261	0.002
500	612		750	0.080	1.074	1.089	0.003
750	919		1000	0.061	1.055	1.512	0.003
1000	2667		9999	0.097	1.056	2.150	0.003
0	9	Cement and Mortar Mixer	15	0.371	1.943	2.326	0.005
15	25		25	0.441	1.398	2.596	0.004
0	18	Concrete/Industrial Saws	25	0.500	1.708	3.163	0.005
25	33		50	0.968	3.674	3.519	0.005
50	81		120	0.454	2.644	3.239	0.005
120	175		175	0.318	2.245	2.712	0.005
0	41	Cranes	50	0.642	0.826	1.760	0.002
50	89		120	0.348	0.749	2.768	0.001
120	148		175	0.224	0.757	2.272	0.001
175	217		250	0.188	0.754	2.126	0.001
250	336		500	0.134	0.752	1.627	0.001
500	567		750	0.088	0.751	1.243	0.001
750	938		1000	0.316	0.748	3.355	0.001
1000	1030		9999	0.043	0.752	0.665	0.001
0	43	Crawler Tractors	50	1.131	1.328	2.709	0.002
50	87		120	0.390	1.227	3.150	0.002
120	150		175	0.280	1.215	2.882	0.002
175	203		250	0.201	1.218	2.593	0.002
250	341		500	0.179	1.225	2.264	0.002
500	570		750	0.155	1.218	2.026	0.002
750	828		1000	0.217	1.224	3.215	0.002
1000	1527		9999	0.155	1.168	2.611	0.002
0	45	Crushing/Proc. Equipmen	50	1.246	4.529	3.906	0.006
50	85		120	0.563	2.983	3.616	0.005
120	171		175	0.402	2.528	3.034	0.005
175	250		250	0.282	0.919	2.642	0.005
250	382		500	0.266	0.895	2.287	0.004
500	602		750	0.265	0.890	2.356	0.004
750	1337		9999	0.310	0.994	3.666	0.004
0	16	Dumpers/Tenders	25	0.262	0.890	1.664	0.003
0	36	Excavators	50	0.326	1.083	1.842	0.002
50	82		120	0.190	0.962	1.798	0.002

120	146		175	0.143	0.973	1.559	0.002
175	218		250	0.105	0.973	1.401	0.002
250	329		500	0.085	0.969	1.075	0.002
500	578		750	0.097	0.964	1.282	0.002
750	843		1000	0.127	0.970	2.123	0.002
1000	1569		9999	0.089	0.963	1.389	0.002
0	42	Forklifts	50	0.392	0.638	1.138	0.001
50	82		120	0.152	0.572	1.251	0.001
120	141		175	0.111	0.573	1.141	0.001
175	208		250	0.113	0.574	1.277	0.001
250	344		500	0.074	0.575	0.812	0.001
500	880		1000	0.327	0.573	3.140	0.001
0	11	Generator Sets	15	0.535	2.680	3.696	0.007
15	19		25	0.573	1.927	3.563	0.005
25	33		50	0.869	3.298	3.512	0.005
50	84		120	0.443	2.576	3.337	0.005
120	153		175	0.301	2.176	2.842	0.005
175	229		250	0.200	0.802	2.486	0.005
250	363		500	0.181	0.798	2.194	0.004
500	586		750	0.187	0.798	2.278	0.004
750	1130		9999	0.245	0.893	3.420	0.004
0	39	Graders	50	1.319	1.158	2.665	0.002
50	91		120	0.510	1.103	3.848	0.002
120	148		175	0.346	1.131	3.372	0.002
175	204		250	0.170	1.121	2.314	0.002
250	293		500	0.143	1.110	1.506	0.002
500	796		1000	0.303	1.109	3.798	0.002
1000	1993		9999	0.193	1.107	2.690	0.002
0	38	Off-Highway Tractors	50	0.675	1.302	2.348	0.002
50	75		120	0.285	1.179	2.459	0.002
120	158		175	0.178	1.175	1.965	0.002
175	214		250	0.163	1.167	2.147	0.002
250	334		500	0.110	1.168	1.395	0.002
500	574		750	0.115	1.171	1.556	0.002
750	1000		1000	0.049	1.172	1.010	0.002
1000	1726		9999	0.098	1.199	1.635	0.002
0	29	Off-Highway Trucks	50	0.668	0.652	2.235	0.002
50	87		120	0.258	0.596	2.039	0.002
120	159		175	0.189	0.602	1.775	0.002
175	211		250	0.178	0.600	1.843	0.002
250	372		500	0.140	0.609	1.546	0.002
500	656		750	0.167	0.607	1.773	0.002
750	897		1000	0.157	0.604	2.305	0.002
1000	1764		9999	0.163	0.608	2.145	0.002
0	38	Other Construction Equip	50	0.557	1.338	2.284	0.002
50	82		120	0.306	1.192	2.628	0.002
120	152		175	0.228	1.189	2.417	0.002
175	217		250	0.166	1.203	2.194	0.002
250	357		500	0.134	1.203	1.699	0.002
500	598		750	0.109	1.197	1.556	0.002
750	830		1000	0.092	1.192	1.764	0.002
1000	1127		9999	0.130	1.167	2.072	0.002

0	35	Other General Industrial E	50	0.508	0.972	1.848	0.002
50	73		120	0.256	0.869	2.099	0.002
120	149		175	0.168	0.872	1.727	0.002
175	209		250	0.156	0.875	1.848	0.002
250	355		500	0.122	0.874	1.418	0.002
500	592		750	0.087	0.875	1.060	0.002
750	885		1000	0.087	0.872	1.622	0.002
1000	2000		9999	0.088	0.872	1.519	0.002
0	36	Other Material Handling E	50	0.730	1.196	2.293	0.002
50	93		120	0.213	1.081	1.897	0.002
120	145		175	0.202	1.078	2.060	0.002
175	218		250	0.165	1.076	2.054	0.002
250	331		500	0.133	1.074	1.602	0.002
500	565		750	0.106	1.078	1.390	0.002
750	923		1000	0.024	1.078	0.900	0.002
1000	1050		9999	0.066	1.078	1.379	0.002
0	39	Pavers	50	0.794	1.429	2.317	0.002
50	80		120	0.283	1.274	2.445	0.002
120	158		175	0.188	1.281	2.025	0.002
175	213		250	0.093	1.285	1.672	0.002
250	327		500	0.078	1.267	1.198	0.002
500	750		750	0.079	1.280	1.019	0.002
0	35	Paving Equipment	50	0.368	1.293	1.770	0.002
50	89		120	0.232	1.177	2.036	0.002
120	148		175	0.138	1.170	1.535	0.002
175	216		250	0.110	1.174	1.572	0.002
250	339		500	0.113	1.166	1.550	0.002
500	605		750	0.085	1.174	1.383	0.002
750	842		1000	0.085	1.175	1.643	0.002
0	8	Plate Compactors	15	0.284	1.492	1.781	0.004
0	13	Pressure Washers	15	0.217	1.087	1.498	0.003
15	19		25	0.232	0.781	1.445	0.002
25	38		50	0.266	1.127	1.371	0.002
50	64		120	0.155	0.995	1.291	0.002
0	8	Pumps	15	0.600	2.680	3.729	0.007
15	21		25	0.634	1.927	3.563	0.005
25	37		50	0.941	3.472	3.556	0.005
50	84		120	0.464	2.617	3.388	0.005
120	151		175	0.317	2.210	2.887	0.005
175	217		250	0.212	0.816	2.527	0.005
250	372		500	0.192	0.811	2.222	0.004
500	615		750	0.198	0.811	2.307	0.004
750	1460		9999	0.254	0.907	3.460	0.004
0	36	Rollers	50	0.495	1.180	1.964	0.002
50	87		120	0.247	1.064	2.178	0.002
120	144		175	0.133	1.059	1.590	0.002
175	213		250	0.121	1.063	1.649	0.002
250	335		500	0.131	1.075	1.672	0.002
500	521		750	0.026	1.061	0.260	0.002
0	47	Rough Terrain Forklifts	50	0.487	1.273	2.050	0.002
50	96		120	0.127	1.145	1.544	0.002
120	130		175	0.088	1.142	1.290	0.002

175	208		250	0.061	1.145	0.992	0.002
250	374		500	0.075	1.132	1.424	0.002
500	625		750	0.037	1.143	0.529	0.002
0	42	Rubber Tired Dozers	50	1.234	1.059	2.643	0.002
50	82		120	0.500	0.980	3.702	0.002
120	150		175	0.400	0.970	3.895	0.002
175	211		250	0.304	0.973	3.160	0.002
250	354		500	0.285	0.981	3.048	0.002
500	584		750	0.216	0.969	2.834	0.002
0	42	Rubber Tired Loaders	50	0.778	0.987	2.190	0.002
50	86		120	0.304	0.878	2.382	0.002
120	150		175	0.214	0.888	2.072	0.002
175	206		250	0.149	0.885	1.851	0.002
250	320		500	0.148	0.879	1.674	0.002
500	600		750	0.141	0.864	1.509	0.002
750	837		1000	0.161	0.887	2.433	0.002
1000	1521		9999	0.133	0.884	2.005	0.002
0	36	Scrapers	50	1.651	1.260	3.264	0.003
50	84		120	0.375	1.167	3.446	0.002
120	166		175	0.347	1.155	3.562	0.002
175	225		250	0.345	1.129	3.912	0.002
250	381		500	0.228	1.139	2.777	0.002
500	565		750	0.172	1.139	2.163	0.002
750	950		1000	0.593	1.138	6.460	0.002
1000	1923		9999	0.269	1.163	3.597	0.002
0	6	Signal Boards	15	0.542	2.845	3.397	0.007
15	37		50	1.022	3.842	3.715	0.006
50	82		120	0.484	2.804	3.447	0.005
120	158		175	0.336	2.377	2.897	0.005
175	216		250	0.277	1.049	3.043	0.006
0	43	Skid Steer Loaders	50	0.231	1.377	1.573	0.002
50	71		120	0.105	1.233	1.302	0.002
120	153		175	0.117	1.224	1.437	0.002
175	201		250	0.097	1.214	1.290	0.002
250	277		500	0.038	1.201	0.511	0.002
500	530		750	0.059	1.233	0.890	0.002
750	1000		1000	0.093	1.233	1.471	0.002
0	36	Surfacing Equipment	50	0.330	0.845	1.590	0.002
50	89		120	0.165	0.748	1.523	0.002
120	151		175	0.144	0.747	1.646	0.002
175	216		250	0.097	0.756	1.522	0.002
250	362		500	0.069	0.744	1.046	0.001
500	615		750	0.051	0.750	0.868	0.002
750	814		1000	0.096	0.752	1.740	0.002
1000	1141		9999	0.054	0.737	1.162	0.001
0	36	Sweepers/Scrubbers	50	0.849	1.544	2.609	0.003
50	78		120	0.373	1.393	2.940	0.002
120	159		175	0.356	1.390	3.548	0.002
175	204		250	0.248	1.381	3.090	0.002
250	303		500	0.226	1.387	2.767	0.002
500	848		1000	0.089	1.387	1.867	0.002
0	38	Tractors/Loaders/Backho	50	0.482	0.987	1.921	0.002

50	83		120	0.208	0.912	1.895	0.002
120	144		175	0.150	0.896	1.614	0.002
175	204		250	0.120	0.899	1.631	0.002
250	320		500	0.109	0.901	1.395	0.002
500	575		750	0.116	0.893	1.482	0.002
750	871		1000	0.072	0.912	1.418	0.002
1000	2006		9999	0.121	0.904	1.882	0.002
0	40	Trenchers	50	0.641	1.635	2.662	0.003
50	82		120	0.414	1.473	3.468	0.003
120	144		175	0.306	1.450	3.268	0.002
175	218		250	0.256	1.465	3.172	0.003
250	359		500	0.155	1.457	2.060	0.003
500	619		750	0.063	1.471	0.819	0.003
750	860		1000	0.599	1.462	6.619	0.003
0	11	Welders	15	0.365	1.630	2.268	0.004
15	20		25	0.386	1.172	2.167	0.003
25	46		50	0.711	2.461	2.252	0.003
50	70		120	0.323	1.676	2.160	0.003
120	174		175	0.224	1.413	1.841	0.003
175	211		250	0.152	0.521	1.614	0.003
250	297		500	0.141	0.512	1.403	0.003
0	29	Water Trucks	50	0.668	0.652	2.235	0.002
50	87		120	0.258	0.596	2.039	0.002
120	159		175	0.189	0.602	1.775	0.002
175	211		250	0.178	0.600	1.843	0.002
250	372		500	0.140	0.609	1.546	0.002
500	656		750	0.167	0.607	1.773	0.002
750	897		1000	0.157	0.604	2.305	0.002
1000	1764		9999	0.163	0.608	2.145	0.002

11 HP categories)

g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.063	85.116	6.24	25.16	40.80	0.57	2.92	3,924.79
0.055	67.164	13.39	32.84	52.07	0.59	4.10	4,971.40
0.078	68.185	41.88	94.78	95.58	1.07	10.19	8,896.20
0.093	82.234	40.30	118.01	243.45	1.89	19.63	17,269.09
0.095	254.079	92.45	383.91	1,094.58	8.84	36.25	96,549.91
0.295	273.029	7.93	25.10	44.66	0.48	3.54	3,276.35
0.230	273.029	18.42	44.70	69.09	0.78	5.52	6,552.70
0.377	273.029	62.09	134.80	114.01	1.22	13.94	10,102.08
0.369	273.029	56.35	156.59	321.46	2.33	28.79	21,296.26
0.204	273.029	69.40	234.85	554.03	4.21	29.94	40,135.27
0.133	273.029	73.32	205.25	775.27	6.25	29.02	59,520.34
0.119	273.029	114.44	472.52	1,256.74	9.63	45.90	105,116.18
0.121	273.029	180.97	730.26	1,987.76	15.25	71.72	162,452.35
0.128	273.029	296.38	1,199.77	3,098.55	20.70	103.74	220,607.55
0.076	119.487	6.33	28.65	43.18	0.68	2.99	4,692.69
0.054	88.089	11.73	33.71	69.07	0.86	4.44	7,252.34
0.104	94.779	60.29	146.15	141.15	1.70	15.52	14,078.06
0.190	168.382	72.69	234.76	424.58	3.83	39.44	34,981.87
0.106	183.260	81.87	341.89	703.97	6.72	37.08	63,991.18
0.036	139.423	59.45	164.35	871.43	8.96	21.84	85,321.58
0.036	153.653	82.57	265.41	1,255.01	12.94	33.25	141,207.33
0.026	104.626	174.37	524.40	2,626.79	26.18	68.14	279,001.55
0.261	318.534	5.05	19.12	31.77	0.42	2.35	2,866.80
0.264	318.534	21.65	52.96	83.53	0.94	6.59	7,963.35
0.244	415.232	11.17	33.13	69.99	0.89	4.38	7,474.17
0.535	415.232	76.52	168.43	152.30	1.65	17.65	13,702.64
0.522	415.232	84.49	239.63	496.80	3.68	42.26	33,633.77
0.288	415.232	119.27	411.93	982.16	7.63	50.35	72,665.57
0.409	258.865	77.52	164.40	124.59	1.27	16.62	10,517.31
0.394	255.738	67.46	179.79	374.17	2.49	35.03	22,746.74
0.211	246.433	71.05	230.75	547.45	3.83	31.28	36,443.68
0.141	234.444	75.73	211.37	730.20	5.34	30.63	50,874.41
0.129	243.055	107.60	470.89	1,068.90	7.48	43.46	81,692.58
0.130	242.350	183.67	792.34	1,837.16	12.90	73.84	137,458.77
0.000	0.000						
0.221	427.436	648.67	2,873.93	6,582.52	41.32	227.31	440,259.39
0.429	265.472	85.74	180.96	135.12	1.36	18.24	11,285.20
0.546	343.682	92.35	243.07	511.42	3.27	47.46	29,851.19
0.332	367.587	112.49	362.32	858.81	5.77	49.69	54,969.90
0.242	371.494	120.34	337.78	1,128.78	7.91	49.10	75,356.05
0.198	345.134	165.97	812.23	1,608.34	10.77	67.31	117,584.45
0.213	369.713	301.01	1,455.97	2,939.45	19.78	121.70	210,778.43
0.000	0.000						

0.110	195.553	466.38	2,282.40	4,620.15	28.01	167.66	298,511.78
0.634	443.672	128.51	277.35	227.43	2.41	28.52	19,965.25
0.620	443.672	102.16	281.26	575.56	4.13	52.73	37,712.14
0.342	443.672	134.52	449.96	1,059.61	7.97	58.50	75,867.95
0.220	443.672	138.79	383.59	1,459.81	11.65	54.94	110,918.06
0.197	443.672	187.12	758.17	2,039.15	15.53	75.08	169,482.75
0.195	443.673	296.85	1,140.84	3,276.85	25.06	117.25	267,090.87
0.209	443.672	804.53	3,169.39	8,401.81	55.67	279.99	593,190.07
0.162	216.148	7.90	20.28	34.93	0.41	2.59	3,458.37
0.117	208.660	10.23	31.46	68.47	0.88	4.19	7,457.11
0.213	138.765	79.34	171.60	130.98	1.37	17.40	11,347.77
0.344	228.669	93.03	255.89	507.03	3.66	50.21	33,394.86
0.189	232.995	92.57	309.18	708.09	5.35	41.38	50,902.87
0.106	219.014	89.82	239.09	944.20	7.56	34.98	71,977.30
0.080	183.446	117.27	408.18	1,245.70	9.71	46.20	106,020.59
0.000	0.000						
0.050	111.990	197.77	676.56	2,129.80	16.49	77.80	175,728.29
0.243	156.923	47.39	101.60	77.10	0.80	10.33	6,655.08
0.263	171.952	39.79	108.00	212.75	1.55	21.64	14,163.38
0.149	179.962	46.92	152.41	352.25	2.67	21.02	25,425.83
0.074	168.058	40.43	102.89	449.74	3.67	15.34	34,981.86
0.000	0.000						
0.023	57.204	51.47	157.37	579.17	4.61	20.06	50,339.75
0.372	420.920	9.77	35.47	61.52	0.67	4.09	4,630.12
0.318	420.920	17.43	54.55	84.32	0.95	6.04	7,997.48
0.470	420.920	62.94	143.39	148.41	1.68	15.52	13,890.35
0.467	420.920	81.02	239.01	493.51	3.87	39.21	35,357.26
0.257	420.920	95.82	346.67	821.88	6.76	39.31	64,400.76
0.168	420.920	101.01	301.38	1,160.24	10.12	38.36	96,390.64
0.155	420.920	143.93	583.22	1,720.86	14.00	56.09	152,793.82
0.156	420.920	239.60	941.50	2,844.26	23.15	91.62	246,659.19
0.186	420.920	592.62	2,232.54	6,307.92	44.64	210.60	475,639.23
0.487	318.965	87.67	187.89	145.24	1.51	19.07	12,491.08
0.558	373.677	97.11	263.57	539.18	3.72	50.82	34,003.48
0.314	379.933	105.12	348.19	814.41	5.90	46.48	56,209.86
0.211	382.031	107.46	297.10	1,075.74	8.20	43.11	78,069.26
0.174	355.058	126.48	531.39	1,301.18	9.54	50.99	104,092.33
0.000	0.000						
0.055	110.562	272.39	1,124.78	2,823.12	20.68	109.18	220,328.81
1.852	1128.991	139.05	358.90	775.24	4.66	69.75	42,518.60
0.763	793.736	129.61	410.04	985.50	6.21	56.90	59,156.32
0.279	374.226	106.59	303.14	952.09	6.21	44.08	59,156.32
0.787	1205.093	413.36	2,256.99	3,870.89	24.18	168.33	257,699.65
0.000	0.000						
0.000	0.000						
0.000	0.000						
0.135	213.965	632.80	3,478.70	6,033.23	34.66	233.18	369,357.14
1.652	1947.088	107.49	352.60	808.87	5.96	48.14	56,738.84
0.444	867.695	99.43	262.33	1,017.07	7.93	38.65	75,543.73
0.356	777.452	145.40	505.51	1,486.83	11.32	56.50	123,528.56
0.441	949.548	238.52	819.97	2,486.38	18.80	93.14	200,369.21
0.000	0.000						

0.000	0.000						
0.000	0.000						
0.075	160.623	385.23	1,399.26	4,075.38	26.59	132.82	283,369.92
0.077	120.626	6.18	27.99	42.18	0.67	2.92	4,584.61
0.045	73.505	9.69	27.86	57.10	0.71	3.67	5,995.27
0.108	83.257	71.25	158.51	139.02	1.53	16.50	12,695.85
0.216	169.092	90.21	260.91	520.29	4.02	46.80	36,676.89
0.093	135.388	76.87	272.65	627.24	5.07	33.34	48,314.78
0.000	0.000						
0.000	0.000						
0.040	102.356	111.41	414.97	1,283.74	10.56	44.63	115,320.64
0.051	82.643	3.61	17.71	25.43	0.42	1.79	2,900.93
0.053	95.123	9.25	29.38	63.95	0.82	3.87	6,962.24
0.102	66.128	70.34	150.10	115.15	1.19	15.24	9,863.18
0.203	134.599	80.71	217.63	443.44	3.08	42.52	28,139.07
0.102	122.674	81.85	267.65	627.13	4.57	36.23	43,514.00
0.054	103.965	81.01	219.57	834.94	6.46	32.00	61,499.80
0.063	136.032	140.10	555.75	1,483.29	11.03	56.04	120,388.75
0.047	99.212	234.97	915.99	2,504.08	18.62	93.45	198,423.85
0.587	384.920	96.63	206.51	160.00	1.66	21.00	13,759.53
0.441	295.388	78.22	211.62	431.70	3.01	41.06	27,519.05
0.315	383.028	103.17	338.69	794.32	5.82	45.54	55,373.69
0.156	301.336	86.03	234.07	888.97	6.91	34.03	65,777.25
0.121	262.307	100.36	400.49	1,067.44	7.96	40.21	86,919.87
0.000	0.000						
0.000	0.000						
0.155	320.256	467.78	1,886.58	4,865.80	30.81	162.32	336,269.32
0.171	219.130	20.63	52.00	86.65	1.00	6.61	8,463.90
0.248	159.529	92.00	194.53	150.59	1.53	19.72	12,695.85
0.304	198.483	95.65	252.98	540.30	3.44	48.00	31,386.97
0.240	272.918	117.41	381.71	912.45	6.11	51.23	58,189.31
0.181	269.306	143.56	411.44	1,331.09	9.26	59.19	88,165.67
0.083	141.065	151.93	793.83	1,469.39	9.69	62.13	105,798.77
0.101	164.512	9.26	26.62	54.55	0.68	3.50	5,727.92
0.188	122.494	77.73	164.48	128.43	1.31	16.70	10,852.90
0.252	166.573	74.75	198.08	423.68	2.71	37.41	24,720.50
0.185	212.473	91.53	298.51	714.72	4.81	39.84	45,823.37
0.000	0.000						
0.000	0.000						
0.044	65.879	89.70	258.27	833.30	5.83	37.00	55,470.42
0.162	244.589	2.75	12.06	18.70	0.28	1.30	1,956.71
0.151	170.643	4.68	17.00	29.48	0.32	1.96	2,218.36
0.129	170.643	7.07	22.12	34.18	0.38	2.45	3,242.22
0.169	170.643	24.32	57.51	67.42	0.78	6.43	6,484.44
0.169	170.643	23.09	70.61	146.12	1.20	10.82	10,921.16
0.455	420.920	8.16	25.80	45.90	0.49	3.64	3,367.36
0.354	420.920	24.85	60.30	93.20	1.05	7.44	8,839.32
0.488	420.920	74.66	168.38	167.90	1.88	18.06	15,574.03
0.484	420.920	83.13	242.51	500.38	3.87	40.62	35,357.26
0.267	420.920	97.13	347.20	822.35	6.67	40.24	63,558.87
0.174	420.920	98.68	291.04	1,114.90	9.59	37.85	91,339.61
0.160	420.920	151.48	628.14	1,782.21	14.34	59.44	156,582.14



0.162	420.920	257.88	1,038.45	3,016.30	24.29	99.40	258,865.51
0.189	420.920	776.90	3,009.65	8,230.93	57.67	276.01	614,542.92
0.051	80.351	3.87	17.50	26.38	0.42	1.83	2,866.80
0.043	69.676	9.79	28.13	57.64	0.72	3.70	6,052.15
0.116	81.971	75.53	162.86	134.91	1.42	16.75	11,785.75
0.174	125.472	73.55	201.83	421.53	2.93	37.19	26,756.85
0.114	146.485	88.28	296.77	705.57	5.15	38.09	49,054.23
0.075	133.411	96.16	275.62	954.92	7.29	38.87	69,440.42
0.482	324.798	103.65	223.68	176.33	1.85	22.79	15,357.89
0.425	294.068	77.55	213.73	432.18	3.10	40.90	28,326.77
0.345	437.172	101.39	339.20	791.40	5.95	44.65	56,653.55
0.189	371.911	99.18	271.38	1,024.63	8.14	39.32	77,472.00
0.000	0.000						
0.084	186.206	131.53	491.22	1,394.74	10.66	52.73	116,378.64
1.410	1412.268	132.93	415.76	997.93	6.17	58.63	58,729.68
0.782	1020.078	154.71	436.27	1,366.70	8.74	63.81	83,228.32
0.536	802.660	197.64	1,085.43	1,808.56	11.01	80.17	120,144.18
0.576	857.369	299.41	1,634.21	2,765.29	16.98	121.54	180,887.43
0.000	0.000						
0.299	459.645	470.87	2,601.73	4,457.47	25.20	174.42	268,478.61
0.108	184.165	11.48	34.04	71.91	0.91	4.50	7,678.94
0.248	164.013	98.02	210.36	163.73	1.70	21.38	14,129.25
0.264	178.155	75.61	205.84	420.64	2.93	39.55	26,722.73
0.191	234.204	89.28	296.54	694.04	5.06	39.39	48,223.75
0.115	211.376	91.86	254.11	924.52	7.10	36.80	67,574.71
0.087	179.033	128.94	534.31	1,334.40	9.85	51.96	107,505.17
0.129	263.180	269.01	1,094.57	2,803.13	20.67	107.70	220,232.08
0.086	177.105	374.44	1,550.43	3,899.12	25.28	130.40	269,377.34
1.868	1178.450	132.08	347.30	734.02	4.66	67.53	42,592.54
0.721	796.487	137.81	444.05	1,054.99	7.05	60.77	67,165.12
0.379	571.806	153.69	433.61	1,432.89	9.98	62.93	95,014.12
0.377	648.067	208.32	1,039.40	2,010.88	13.36	84.71	145,797.48
0.000	0.000						
0.000	0.000						
0.000	0.000						
0.077	130.956	364.14	1,795.59	3,539.19	23.64	147.55	251,869.33
0.288	466.425	3.66	17.09	24.53	0.41	1.73	2,798.55
0.549	443.672	86.63	192.27	179.78	1.98	20.33	16,415.87
0.543	443.672	89.47	256.02	526.72	3.98	44.49	36,381.11
0.299	443.672	112.29	392.79	928.22	7.36	47.32	70,100.20
0.236	536.104	131.01	377.70	1,445.61	12.16	50.99	115,798.41
0.117	143.940	16.54	40.77	65.08	0.74	5.07	6,256.92
0.207	164.106	61.59	139.76	123.57	1.40	14.58	11,575.30
0.000	0.000						
0.000	0.000						
0.000	0.000						
0.000	0.000						
0.024	19.396	45.75	136.13	261.14	2.12	24.34	19,396.43
0.229	179.415	35.40	77.99	71.09	0.77	8.18	6,399.12
0.412	326.162	74.21	209.70	439.03	3.17	36.53	28,924.01
0.183	257.701	65.16	226.86	538.69	4.09	27.55	38,906.65
0.144	283.137	78.44	231.80	809.68	6.42	31.16	61,175.59

0.127	276.905	114.51	531.64	1,231.50	9.19	45.86	100,338.15
0.000	0.000						
0.000	0.000						
0.064	137.965	183.85	834.09	1,974.76	14.77	72.66	157,418.31
0.094	152.169	6.74	33.06	47.47	0.79	3.34	5,415.08
0.065	114.751	12.11	39.45	83.31	1.05	5.06	8,896.19
0.132	89.742	95.22	205.07	163.21	1.73	21.01	14,311.27
0.240	166.517	92.36	253.57	507.09	3.73	49.00	34,037.62
0.163	208.420	111.81	370.07	863.09	6.62	49.30	63,046.94
0.039	86.663	84.97	224.30	937.92	7.72	32.81	73,490.32
0.134	187.845	15.05	39.68	71.50	0.85	5.11	7,195.45
0.240	166.547	88.77	194.07	155.09	1.66	19.84	13,765.22
0.230	163.015	61.94	174.21	343.54	2.57	33.16	23,463.45
0.171	225.193	78.88	270.34	617.31	4.83	35.02	45,988.35
0.110	243.327	90.28	242.68	984.13	8.18	35.13	77,898.58
0.110	272.221	159.48	546.91	1,773.39	16.43	63.40	156,422.88
0.000	0.000						
0.048	116.988	245.16	820.37	2,747.98	24.64	96.68	234,634.43
0.060	96.524	5.02	23.44	33.65	0.56	2.37	3,839.47
0.107	181.964	22.32	66.18	139.82	1.77	8.76	14,931.28
0.155	103.783	102.82	218.46	175.19	1.80	22.29	14,931.28
0.199	134.767	87.88	234.22	502.99	3.22	43.46	29,435.96
0.156	182.058	129.23	423.99	1,016.53	6.85	55.88	65,271.02
0.109	163.272	163.16	472.91	1,518.03	10.62	67.19	101,106.09
0.096	164.194	201.16	1,086.78	1,959.16	12.94	82.17	141,207.23
0.277	255.965	6.82	21.57	38.38	0.41	3.04	2,815.61
0.216	255.965	14.39	34.92	53.97	0.61	4.31	5,119.30
0.333	255.965	66.66	146.40	130.73	1.42	15.32	11,774.38
0.327	255.965	45.56	128.63	264.64	1.96	22.92	17,917.54
0.181	255.965	73.85	254.59	601.40	4.68	31.46	44,537.86
0.119	255.965	63.81	181.80	688.27	5.67	25.09	54,008.57
0.107	255.965	79.63	337.05	893.99	6.96	31.79	76,021.52
1.652	1947.088	107.486	352.601	808.870	5.958	48.137	56738.842
0.444	867.695	99.434	262.331	1017.072	7.933	38.649	75543.734
0.356	777.452	145.401	505.515	1486.832	11.316	56.505	123528.562
0.441	949.548	238.524	819.969	2486.377	18.803	93.135	200369.215
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.075	160.623	385.226	1399.263	4075.377	26.593	132.816	283369.917

g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.032	179.282	3.39	39.91	52.24	0.08	1.49	8,267
0.034	161.199	3.95	57.61	62.10	0.11	2.55	11,932

0.026	161.168	6.29	101.52	79.00	0.20	3.44	21,028
0.190	161.179	74.45	163.42	766.87	0.32	39.84	33,848
0.032	161.179	29.73	295.70	543.33	0.58	12.11	61,248
0.141	272.784	4.67	20.86	29.03	0.05	1.69	3,273
0.124	272.784	9.87	30.00	55.47	0.08	2.97	6,547
0.206	272.784	30.48	104.23	90.85	0.13	7.61	10,093
0.197	272.784	28.66	143.32	183.57	0.25	15.37	21,277
0.109	272.784	37.88	227.72	294.49	0.45	15.95	40,099
0.054	272.784	38.58	124.26	383.27	0.67	11.82	59,467
0.051	272.784	63.85	214.31	585.52	1.03	19.44	105,022
0.052	272.784	99.63	331.21	941.47	1.63	30.77	162,306
0.065	272.784	152.42	503.88	1,917.46	2.22	52.40	220,409
0.192	300.786	17.96	47.46	104.56	0.11	7.55	11,813
0.111	255.267	13.29	84.43	158.07	0.20	9.16	21,016
0.081	265.536	22.31	158.45	269.88	0.38	12.08	39,441
0.043	260.705	21.04	217.59	302.97	0.52	8.89	54,162
0.039	256.880	31.42	360.36	440.34	0.86	13.59	89,698
0.036	267.327	49.22	657.23	666.18	1.56	22.10	163,594
0.030	262.715	55.76	969.95	1,389.24	2.31	27.38	241,435
0.053	262.792	257.46	2,815.34	5,733.38	6.69	141.78	700,778
0.094	318.248	3.34	17.49	20.93	0.04	0.84	2,864
0.128	318.248	11.03	34.95	64.91	0.10	3.19	7,956
0.118	414.859	9.01	30.75	56.93	0.09	2.12	7,467
0.256	414.859	31.94	121.25	116.13	0.18	8.45	13,690
0.244	414.859	36.76	214.16	262.39	0.39	19.79	33,604
0.136	414.859	55.71	392.85	474.54	0.82	23.86	72,600
0.176	165.341	26.10	33.55	71.52	0.06	7.14	6,718
0.204	149.909	30.94	66.58	246.20	0.13	18.18	13,334
0.123	151.502	33.16	111.88	336.04	0.21	18.20	22,405
0.096	150.967	40.76	163.59	461.42	0.31	20.94	32,760
0.067	150.650	44.89	252.85	546.97	0.48	22.58	50,634
0.044	150.346	49.97	425.83	704.92	0.81	24.98	85,275
0.166	149.778	295.85	701.27	3,145.89	1.34	156.07	140,432
0.016	150.667	44.01	774.95	685.05	1.48	16.75	155,187
0.314	245.102	48.06	56.46	115.15	0.10	13.36	10,419
0.265	226.518	33.88	106.61	273.59	0.19	23.06	19,675
0.159	224.198	41.91	181.67	430.94	0.32	23.76	33,527
0.100	224.784	40.85	247.06	526.01	0.44	20.28	45,596
0.088	226.106	60.87	417.40	771.21	0.74	29.88	77,033
0.075	224.739	88.49	694.26	1,154.81	1.22	42.48	128,127
0.095	225.808	179.35	1,013.30	2,662.96	1.79	78.73	187,007
0.070	215.490	237.27	1,782.39	3,985.53	3.14	106.21	328,945
0.312	443.274	56.07	203.80	175.77	0.26	14.05	19,947
0.297	443.274	47.88	253.57	307.37	0.44	25.21	37,678
0.165	443.274	68.70	432.36	518.79	0.85	28.19	75,800
0.082	443.274	70.42	229.80	660.44	1.25	20.57	110,818
0.077	443.274	101.59	341.70	873.69	1.66	29.37	169,331
0.077	443.274	159.51	535.64	1,418.28	2.68	46.63	266,851
0.100	443.274	414.51	1,329.60	4,901.23	5.96	133.10	592,657
0.067	215.954	4.20	14.24	26.62	0.04	1.07	3,455
0.137	222.472	11.64	38.71	65.84	0.08	4.89	7,951
0.131	197.677	15.55	78.70	147.04	0.15	10.75	16,165

0.077	199.859	20.87	142.10	227.61	0.28	11.20	29,187
0.044	199.878	22.90	212.60	305.98	0.42	9.66	43,668
0.035	198.989	28.01	318.38	353.25	0.62	11.37	65,396
0.042	197.951	55.84	556.98	741.08	1.09	24.33	114,404
0.057	199.204	107.17	817.45	1,789.35	1.60	48.09	167,904
0.036	197.811	139.07	1,511.16	2,180.26	2.96	57.22	310,393
0.117	117.014	16.63	27.04	48.27	0.05	4.97	4,963
0.105	105.000	12.53	47.13	103.01	0.08	8.61	8,649
0.062	105.128	15.75	80.94	161.15	0.14	8.81	14,853
0.056	105.400	23.62	119.55	265.80	0.21	11.71	21,939
0.035	105.464	25.49	197.53	279.26	0.35	12.00	36,250
0.175	105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
0.198	420.542	5.89	29.48	40.66	0.07	2.18	4,626
0.183	420.542	10.89	36.62	67.70	0.10	3.47	7,990
0.243	420.542	28.68	108.82	115.91	0.18	8.03	13,878
0.237	420.542	37.24	216.41	280.31	0.41	19.87	35,326
0.130	420.542	46.04	332.95	434.85	0.72	19.91	64,343
0.069	420.542	45.90	183.66	569.26	1.08	15.75	96,304
0.064	420.542	65.65	289.79	796.37	1.50	23.41	152,657
0.066	420.542	109.66	467.82	1,334.62	2.48	38.63	246,438
0.086	420.542	277.31	1,008.57	3,864.37	4.78	97.20	475,212
0.353	223.068	51.67	45.33	104.35	0.08	13.83	8,736
0.319	212.476	46.43	100.33	350.14	0.18	29.00	19,335
0.189	217.953	51.24	167.32	498.82	0.31	28.02	32,245
0.075	216.080	34.81	229.13	472.95	0.42	15.36	44,157
0.059	213.889	41.92	325.38	441.63	0.60	17.25	62,706
0.132	213.737	241.58	882.83	3,023.02	1.62	105.21	170,135
0.082	213.348	383.95	2,206.16	5,361.41	4.06	163.30	425,161
0.220	253.086	25.43	49.03	88.44	0.09	8.30	9,531
0.198	229.238	21.22	87.89	183.27	0.16	14.73	17,085
0.100	228.420	28.17	185.75	310.54	0.34	15.76	36,108
0.074	226.842	34.96	249.54	459.12	0.46	15.91	48,508
0.048	226.996	36.88	390.53	466.68	0.72	16.06	75,915
0.051	227.579	65.86	671.45	892.36	1.25	29.25	130,525
0.025	227.753	48.90	1,171.61	1,010.30	2.17	24.96	227,753
0.042	233.086	168.64	2,069.85	2,822.13	3.84	71.89	402,366
0.232	215.360	19.47	19.00	65.12	0.06	6.77	6,276
0.164	196.937	22.50	51.91	177.51	0.16	14.30	17,146
0.098	198.697	30.04	95.59	281.98	0.30	15.63	31,571
0.079	198.272	37.60	126.67	388.95	0.40	16.74	41,838
0.058	201.187	52.30	226.85	575.73	0.72	21.72	74,925
0.071	200.607	109.57	398.38	1,162.91	1.26	46.75	131,582
0.067	199.554	140.90	542.09	2,067.97	1.71	60.11	179,046
0.066	200.748	288.37	1,072.26	3,783.95	3.38	116.54	354,157
0.204	243.350	21.16	50.85	86.82	0.09	7.77	9,249
0.206	216.898	24.94	97.26	214.31	0.17	16.79	17,691
0.127	216.304	34.77	181.33	368.51	0.31	19.38	32,984
0.081	218.792	35.92	260.90	475.80	0.45	17.54	47,457
0.063	218.769	47.72	429.19	606.26	0.75	22.33	78,070
0.050	217.690	65.00	715.27	930.09	1.24	30.18	130,108
0.045	216.833	76.23	989.58	1,464.06	1.72	37.29	180,005
0.058	212.338	146.37	1,315.20	2,334.98	2.28	65.03	239,235

0.173	199.186	17.83	34.13	64.85	0.07	6.07	6,992
0.177	177.921	18.73	63.57	153.66	0.12	12.95	13,022
0.094	178.621	25.08	130.06	257.61	0.25	14.05	26,642
0.074	179.141	32.66	182.83	386.28	0.36	15.52	37,451
0.054	179.029	43.39	310.02	502.96	0.61	19.26	63,504
0.034	179.232	51.39	517.60	627.01	1.01	20.30	106,023
0.038	178.698	76.68	772.06	1,435.27	1.51	33.86	158,148
0.041	178.698	176.19	1,744.77	3,038.91	3.41	81.97	357,397
0.235	229.351	26.10	42.74	81.98	0.08	8.38	8,198
0.145	207.401	19.81	100.73	176.71	0.18	13.52	19,322
0.110	206.802	29.23	155.86	297.83	0.29	15.97	29,897
0.075	206.479	35.98	234.96	448.38	0.43	16.30	45,071
0.062	205.960	44.24	355.79	530.93	0.65	20.40	68,248
0.049	206.729	60.02	608.45	784.52	1.11	27.56	116,716
0.007	206.729	22.15	994.72	831.01	1.82	6.66	190,811
0.028	206.729	68.86	1,131.59	1,448.10	2.07	29.14	217,066
0.236	242.601	30.69	55.20	89.51	0.09	9.13	9,370
0.190	216.225	22.48	101.38	194.60	0.16	15.09	17,208
0.101	217.410	29.79	202.54	320.17	0.33	15.91	34,380
0.043	218.066	19.79	273.91	356.38	0.44	9.22	46,494
0.040	215.005	25.66	414.68	392.33	0.67	13.09	70,388
0.045	217.241	59.36	959.87	764.54	1.56	33.45	162,931
0.143	204.623	12.82	45.02	61.63	0.07	4.99	7,124
0.156	186.353	20.52	104.32	180.38	0.16	13.79	16,511
0.076	185.219	20.51	173.68	227.75	0.26	11.30	27,488
0.052	185.724	23.81	253.09	339.13	0.38	11.31	40,055
0.055	184.481	38.42	394.88	525.24	0.60	18.76	62,495
0.033	185.774	51.25	710.17	836.95	1.07	20.10	112,393
0.041	185.931	71.79	989.20	1,383.00	1.50	34.13	156,554
0.070	244.369	2.28	11.94	14.25	0.03	0.56	1,955
0.080	170.490	2.82	14.13	19.48	0.03	1.05	2,216
0.074	170.490	4.41	14.85	27.45	0.04	1.41	3,239
0.083	170.490	10.10	42.82	52.12	0.08	3.17	6,479
0.082	170.490	9.93	63.68	82.62	0.13	5.24	10,911
0.217	420.542	4.80	21.44	29.84	0.05	1.73	3,364
0.191	420.542	13.31	40.47	74.83	0.11	4.01	8,831
0.256	420.542	34.80	128.45	131.57	0.20	9.47	15,560
0.248	420.542	38.95	219.85	284.62	0.41	20.84	35,326
0.137	420.542	47.80	333.67	435.87	0.71	20.62	63,502
0.072	420.542	46.02	176.97	548.29	1.03	15.54	91,258
0.067	420.542	71.59	301.62	826.42	1.54	24.92	156,442
0.068	420.542	121.86	498.65	1,418.72	2.60	42.11	258,633
0.088	420.542	371.15	1,324.36	5,052.17	6.17	128.66	613,991
0.172	218.635	17.64	42.11	70.09	0.07	6.15	7,801
0.160	197.013	21.43	92.39	189.21	0.16	13.93	17,113
0.074	196.123	19.07	152.24	228.66	0.27	10.63	28,198
0.056	196.817	25.79	226.60	351.64	0.40	12.00	41,971
0.065	199.035	43.92	359.85	559.90	0.64	21.75	66,652
0.003	196.512	13.68	552.23	135.12	0.98	1.74	102,285
0.167	233.997	23.05	60.17	96.93	0.11	7.89	11,064
0.086	210.615	12.22	110.33	148.70	0.19	8.25	20,288
0.050	210.004	11.38	148.00	167.16	0.26	6.48	27,215

0.024	210.544	12.61	238.51	206.71	0.42	4.91	43,858
0.031	208.184	27.98	423.31	532.33	0.74	11.74	77,838
0.004	210.233	22.83	714.57	330.69	1.25	2.27	131,396
0.350	226.464	51.32	44.05	109.92	0.09	14.56	9,418
0.332	209.594	40.77	79.99	302.01	0.16	27.08	17,101
0.224	207.394	59.95	145.21	583.01	0.30	33.47	31,043
0.156	208.083	64.22	205.36	666.79	0.42	32.97	43,901
0.142	209.655	100.82	347.22	1,079.11	0.71	50.21	74,229
0.103	207.184	126.44	566.07	1,655.10	1.16	59.96	121,016
0.239	210.053	32.45	41.17	91.31	0.08	9.95	8,758
0.204	186.760	26.18	75.64	205.19	0.15	17.61	16,089
0.116	188.830	32.10	133.15	310.72	0.27	17.33	28,324
0.063	188.278	30.66	182.25	381.06	0.37	13.00	38,767
0.063	187.073	47.35	281.15	535.23	0.57	20.10	59,805
0.059	183.891	84.78	519.10	906.30	1.05	35.63	110,422
0.072	188.699	134.50	742.33	2,035.78	1.51	59.89	157,906
0.056	187.956	201.95	1,343.95	3,050.21	2.73	84.43	285,882
0.441	279.274	59.67	45.54	117.98	0.10	15.95	10,094
0.262	258.769	31.61	98.45	290.58	0.21	22.09	21,821
0.191	255.913	57.68	191.85	591.92	0.41	31.80	42,524
0.177	250.340	77.71	254.10	880.01	0.54	39.82	56,320
0.112	252.381	87.10	434.23	1,059.17	0.92	42.69	96,245
0.081	252.525	96.94	643.65	1,222.10	1.36	45.65	142,664
0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.137	257.796	517.49	2,236.99	6,917.29	4.73	263.94	495,821
0.133	466.006	3.25	17.07	20.38	0.04	0.80	2,796
0.269	443.274	37.81	142.16	137.46	0.21	9.94	16,401
0.258	443.274	39.66	229.93	282.67	0.43	21.19	36,348
0.143	443.274	53.13	375.62	457.78	0.79	22.62	70,037
0.089	535.623	59.81	226.48	657.22	1.30	19.24	115,694
0.089	215.209	10.05	59.86	68.36	0.09	3.85	9,355
0.073	192.771	7.43	87.00	91.87	0.13	5.13	13,597
0.067	191.332	17.89	187.21	219.78	0.28	10.23	29,260
0.047	189.689	19.37	243.38	258.73	0.36	9.45	38,039
0.013	187.666	10.50	332.20	141.33	0.50	3.72	51,921
0.037	192.714	31.48	653.51	471.70	0.98	19.85	102,138
0.047	192.714	93.31	1,233.03	1,471.46	1.84	46.84	192,714
0.122	177.820	11.76	30.13	56.70	0.06	4.37	6,342
0.105	157.345	14.61	66.30	135.06	0.13	9.32	13,953
0.080	157.180	21.80	112.75	248.44	0.23	12.07	23,730
0.045	159.095	20.94	163.33	328.84	0.33	9.66	34,375
0.033	156.530	24.83	269.49	378.90	0.54	12.14	56,719
0.028	157.930	31.41	461.54	534.00	0.93	17.18	97,139
0.043	158.248	77.81	612.26	1,416.54	1.23	34.90	128,859
0.027	155.194	61.90	841.35	1,326.18	1.69	30.32	177,076
0.275	265.154	30.23	54.93	92.84	0.09	9.77	9,436
0.260	239.305	28.93	108.00	227.96	0.18	20.16	18,552
0.191	238.803	56.70	221.69	565.80	0.36	30.43	38,082
0.123	237.291	50.75	282.36	631.64	0.46	25.13	48,504
0.121	238.264	68.49	419.57	836.87	0.69	36.53	72,075
0.049	238.264	75.67	1,176.17	1,583.48	1.93	41.88	202,048
0.168	210.705	18.47	37.80	73.59	0.08	6.42	8,071

0.146	194.693	17.15	75.36	156.62	0.15	12.06	16,091
0.082	191.374	21.61	129.00	232.29	0.26	11.77	27,545
0.053	192.049	24.47	183.67	333.08	0.37	10.90	39,220
0.048	192.380	35.05	288.43	446.71	0.59	15.46	61,588
0.053	190.737	66.52	513.28	851.56	1.05	30.58	109,601
0.032	194.680	62.32	794.47	1,235.33	1.62	28.20	169,644
0.056	193.002	242.62	1,812.80	3,775.55	3.70	113.13	387,090
0.239	293.864	25.50	65.04	105.90	0.11	9.49	11,689
0.272	264.741	34.00	120.87	284.60	0.21	22.32	21,724
0.165	260.525	44.07	208.54	470.14	0.36	23.69	37,482
0.126	263.310	55.99	319.99	692.75	0.55	27.59	57,513
0.075	261.890	55.74	522.40	738.48	0.90	26.97	93,892
0.027	264.347	38.99	910.79	507.24	1.56	16.76	163,697
0.302	262.792	515.43	1,257.44	5,692.37	2.16	259.50	226,001
0.132	255.735	4.01	17.93	24.95	0.04	1.45	2,813
0.116	255.735	7.71	23.44	43.34	0.06	2.32	5,115
0.181	255.735	32.70	113.22	103.61	0.15	8.32	11,764
0.174	255.735	22.63	117.32	151.20	0.21	12.18	17,901
0.096	255.735	39.05	245.92	320.30	0.50	16.67	44,498
0.049	255.735	32.14	109.96	340.60	0.61	10.24	53,960
0.045	255.735	41.87	152.04	416.74	0.75	13.44	75,953
0.232	215.360	19.472	19.000	65.119	0.060	6.769	6275.662
0.164	196.937	22.504	51.911	177.515	0.164	14.297	17145.800
0.098	198.697	30.036	95.585	281.983	0.301	15.635	31570.801
0.079	198.272	37.596	126.672	388.949	0.400	16.741	41838.390
0.058	201.187	52.301	226.848	575.730	0.715	21.720	74925.493
0.071	200.607	109.574	398.383	1162.915	1.257	46.754	131581.753
0.067	199.554	140.901	542.086	2067.973	1.710	60.107	179045.521
0.066	200.748	288.370	1072.261	3783.945	3.382	116.536	354156.761

**2006**

2006 data has not been updated and not used in this model  
 (OFFROAD2007 rows were added or deleted to match OFFROAD2011 HP categories)

AvgHP		2006		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
		Equipment	MaxHP	ROG	CO	NOX	SOX	PM
0	46	Aerial Lifts	50	0.125	0.536	0.822	0.012	0.059
50	74		120	0.171	0.427	0.689	0.008	0.054
120	130		175	0.306	0.710	0.721	0.008	0.076
175	210		250	0.182	0.556	1.122	0.009	0.090
250	380		500	0.225	0.928	2.726	0.023	0.089
0	12	Air Compressors	15	0.631	2.053	3.582	0.040	0.283
15	24		25	0.728	1.794	2.820	0.032	0.223
25	37		50	1.615	3.579	3.037	0.033	0.369
50	78		120	0.690	1.988	3.994	0.030	0.359
120	147		175	0.452	1.587	3.649	0.029	0.198
175	218		250	0.315	0.881	3.437	0.029	0.124
250	385		500	0.278	1.114	3.095	0.025	0.112
500	595		750	0.284	1.114	3.171	0.026	0.113
750	808		1000	0.348	1.368	3.732	0.026	0.122
0	39	Bore/Drill Rigs	50	0.151	0.730	0.998	0.017	0.071
50	82		120	0.131	0.392	0.802	0.010	0.052
120	149		175	0.351	0.930	0.925	0.011	0.097
175	208		250	0.304	1.111	1.933	0.018	0.171
250	349		500	0.208	0.979	1.894	0.019	0.097
500	612		750	0.090	0.265	1.354	0.015	0.034
750	919		1000	0.084	0.284	1.225	0.014	0.035
1000	2667		9999	0.061	0.193	0.881	0.010	0.024
0	9	Cement and Mortar	15	0.496	2.043	3.206	0.046	0.232
15	25		25	0.819	2.038	3.268	0.038	0.256
0	18	Concrete/Industrial	25	0.573	1.775	3.698	0.049	0.236
25	33		50	2.199	4.967	4.530	0.050	0.518
50	81		120	0.984	2.920	5.913	0.045	0.501
120	175		175	0.645	2.334	5.404	0.044	0.276
0	41	Cranes	50	1.824	3.954	3.020	0.031	0.398
50	89		120	0.720	1.992	4.052	0.028	0.380
120	148		175	0.458	1.541	3.565	0.026	0.204
175	217		250	0.328	0.914	3.238	0.025	0.132
250	336		500	0.302	1.260	3.004	0.022	0.121
500	567		750	0.305	1.256	3.062	0.023	0.122
750	938		1000	0.000	0.000	0.000	0.000	0.000
1000	1030		9999	0.596	2.528	6.188	0.040	0.209
0	43	Crawler Tractors	50	1.932	4.163	3.134	0.032	0.418
50	87		120	1.013	2.761	5.691	0.038	0.528
120	150		175	0.720	2.395	5.545	0.039	0.320
175	203		250	0.562	1.577	5.371	0.039	0.228
250	341		500	0.463	2.197	4.481	0.032	0.187
500	570		750	0.501	2.353	4.897	0.035	0.202
750	828		1000	0.000	0.000	0.000	0.000	0.000



1000	1527		9999	0.291	1.382	2.936	0.018	0.105
0	45	Crushing/Proc. Eq	50	2.740	6.046	4.977	0.054	0.619
50	85		120	1.144	3.275	6.549	0.049	0.601
120	171		175	0.751	2.614	5.985	0.047	0.331
175	250		250	0.518	1.431	5.631	0.047	0.204
250	382		500	0.457	1.795	5.041	0.041	0.184
500	602		750	0.462	1.724	5.166	0.042	0.183
750	1337		9999	0.572	2.189	6.119	0.042	0.199
0	16	Dumpers/Tenders	25	0.439	1.173	2.094	0.026	0.151
0	36	Excavators	50	0.270	0.864	1.809	0.025	0.115
50	82		120	0.905	2.028	1.570	0.017	0.204
120	146		175	0.596	1.731	3.333	0.025	0.327
175	218		250	0.399	1.409	3.101	0.024	0.180
250	329		500	0.255	0.681	2.751	0.023	0.099
500	578		750	0.191	0.649	2.007	0.017	0.074
750	843		1000	0.000	0.000	0.000	0.000	0.000
1000	1569		9999	0.118	0.396	1.265	0.011	0.046
0	42	Forklifts	50	1.054	2.326	1.784	0.019	0.235
50	82		120	0.457	1.298	2.485	0.019	0.253
120	141		175	0.315	1.075	2.392	0.019	0.143
175	208		250	0.179	0.454	2.071	0.018	0.067
250	344		500	0.000	0.000	0.000	0.000	0.000
500	880		1000	0.054	0.159	0.614	0.005	0.021
0	11	Generator Sets	15	0.843	3.164	5.383	0.061	0.356
15	19		25	0.865	2.766	4.347	0.050	0.308
25	33		50	1.817	4.248	4.426	0.051	0.458
50	84		120	0.915	2.814	5.688	0.046	0.451
120	153		175	0.595	2.249	5.195	0.044	0.248
175	229		250	0.410	1.232	4.893	0.044	0.157
250	363		500	0.367	1.479	4.489	0.039	0.145
500	586		750	0.379	1.479	4.600	0.040	0.147
750	1130		9999	0.496	1.840	5.426	0.040	0.177
0	39	Graders	50	2.125	4.675	3.648	0.038	0.472
50	91		120	1.007	2.857	5.703	0.041	0.536
120	148		175	0.674	2.331	5.292	0.040	0.301
175	204		250	0.493	1.366	5.062	0.040	0.197
250	293		500	0.406	1.641	4.175	0.033	0.163
500	796		1000	0.000	0.000	0.000	0.000	0.000
1000	1993		9999	0.128	0.511	1.333	0.010	0.051
0	38	Off-Highway Tractor	50	3.549	9.413	19.997	0.124	1.803
50	75		120	1.675	5.438	12.828	0.083	0.740
120	158		175	0.644	1.833	5.841	0.039	0.266
175	214		250	1.849	9.889	17.338	0.113	0.753
250	334		500	0.000	0.000	0.000	0.000	0.000
500	574		750	0.000	0.000	0.000	0.000	0.000
750	1000		1000	0.000	0.000	0.000	0.000	0.000
1000	1726		9999	0.351	1.892	3.403	0.020	0.130
0	29	Off-Highway Truck	50	3.482	12.035	26.541	0.204	1.569
50	87		120	1.071	2.822	11.177	0.091	0.412
120	159		175	0.864	2.918	8.729	0.071	0.332
175	211		250	1.065	3.564	10.997	0.089	0.412
250	372		500	0.000	0.000	0.000	0.000	0.000

500	656		750	0.000	0.000	0.000	0.000	0.000
750	897		1000	0.000	0.000	0.000	0.000	0.000
1000	1764		9999	0.206	0.728	2.230	0.015	0.072
0	38	Other Construction	50	0.153	0.737	1.007	0.018	0.072
50	82		120	0.109	0.327	0.669	0.009	0.043
120	152		175	0.435	1.004	0.892	0.010	0.104
175	217		250	0.386	1.187	2.302	0.019	0.205
250	357		500	0.201	0.760	1.682	0.014	0.089
500	598		750	0.000	0.000	0.000	0.000	0.000
750	830		1000	0.000	0.000	0.000	0.000	0.000
1000	1127		9999	0.091	0.337	1.059	0.009	0.037
0	35	Other General Indu	50	0.090	0.505	0.630	0.012	0.047
50	73		120	0.122	0.394	0.826	0.011	0.052
120	149		175	0.454	0.988	0.762	0.008	0.100
175	209		250	0.370	1.032	2.055	0.015	0.198
250	355		500	0.222	0.750	1.711	0.013	0.099
500	592		750	0.129	0.347	1.364	0.011	0.050
750	885		1000	0.149	0.570	1.588	0.012	0.059
1000	2000		9999	0.110	0.416	1.188	0.009	0.044
0	36	Other Material Har	50	2.604	5.679	4.416	0.046	0.575
50	93		120	0.804	2.252	4.491	0.032	0.430
120	145		175	0.686	2.330	5.318	0.040	0.307
175	218		250	0.370	1.002	3.935	0.032	0.145
250	331		500	0.285	1.097	3.053	0.024	0.114
500	565		750	0.000	0.000	0.000	0.000	0.000
750	923		1000	0.000	0.000	0.000	0.000	0.000
1000	1050		9999	0.424	1.654	4.512	0.029	0.148
0	39	Pavers	50	0.481	1.255	2.159	0.026	0.161
50	80		120	1.114	2.399	1.867	0.019	0.242
120	158		175	0.577	1.578	3.307	0.022	0.294
175	213		250	0.527	1.767	4.139	0.029	0.232
250	327		500	0.415	1.192	3.930	0.028	0.171
500	750		750	0.192	0.977	1.865	0.013	0.079
0	35	Paving Equipment	50	0.244	0.732	1.498	0.019	0.097
50	89		120	0.847	1.823	1.430	0.015	0.184
120	148		175	0.481	1.316	2.762	0.018	0.244
175	216		250	0.406	1.365	3.205	0.022	0.178
250	339		500	0.000	0.000	0.000	0.000	0.000
500	605		750	0.000	0.000	0.000	0.000	0.000
750	842		1000	0.101	0.291	0.956	0.007	0.042
0	8	Plate Compactors	15	0.321	1.496	2.147	0.036	0.152
0	13	Pressure Washers	15	0.342	1.283	2.182	0.025	0.144
15	19		25	0.351	1.121	1.762	0.020	0.125
25	38		50	0.605	1.476	1.745	0.021	0.164
50	64		120	0.341	1.091	2.210	0.019	0.163
0	8	Pumps	15	0.973	3.164	5.523	0.061	0.436
15	21		25	1.122	2.766	4.347	0.050	0.344
25	37		50	1.926	4.453	4.467	0.051	0.475
50	84		120	0.940	2.855	5.768	0.046	0.467
120	151		175	0.612	2.282	5.267	0.044	0.258
175	217		250	0.423	1.255	4.962	0.044	0.163
250	372		500	0.378	1.551	4.537	0.039	0.150

500	615		750	0.389	1.551	4.649	0.040	0.152
750	1460		9999	0.504	1.916	5.480	0.040	0.179
0	36	Rollers	50	0.102	0.491	0.671	0.012	0.048
50	87		120	0.103	0.310	0.635	0.008	0.041
120	144		175	0.503	1.108	0.924	0.010	0.113
175	213		250	0.326	0.933	1.905	0.014	0.168
250	335		500	0.251	0.875	2.030	0.015	0.109
500	521		750	0.173	0.498	1.767	0.014	0.070
0	47	Rough Terrain For	50	2.065	4.588	3.658	0.039	0.465
50	96		120	0.757	2.191	4.315	0.032	0.407
120	130		175	0.740	2.601	5.861	0.046	0.330
175	208		250	0.441	1.213	4.718	0.039	0.174
250	374		500	0.000	0.000	0.000	0.000	0.000
500	625		750	0.196	0.715	2.088	0.017	0.078
0	42	Rubber Tired Doze	50	3.081	9.882	23.272	0.148	1.365
50	82		120	1.817	5.118	16.240	0.107	0.746
120	150		175	1.270	6.813	11.573	0.074	0.512
175	211		250	1.363	7.277	12.560	0.080	0.551
250	354		500	0.000	0.000	0.000	0.000	0.000
500	584		750	0.774	4.190	7.434	0.043	0.287
0	42	Rubber Tired Load	50	0.254	0.787	1.640	0.022	0.105
50	86		120	1.080	2.380	1.869	0.020	0.241
120	150		175	0.475	1.353	2.699	0.020	0.253
175	206		250	0.411	1.427	3.240	0.025	0.184
250	320		500	0.269	0.746	2.780	0.022	0.107
500	600		750	0.202	0.804	2.090	0.016	0.081
750	837		1000	0.302	1.182	3.152	0.025	0.121
1000	1521		9999	0.232	0.927	2.479	0.017	0.081
0	36	Scrapers	50	3.484	9.477	19.630	0.129	1.808
50	84		120	1.564	5.202	12.083	0.084	0.695
120	166		175	0.876	2.471	8.325	0.060	0.357
175	225		250	0.880	4.253	8.490	0.059	0.357
250	381		500	0.000	0.000	0.000	0.000	0.000
500	565		750	0.000	0.000	0.000	0.000	0.000
750	950		1000	0.000	0.000	0.000	0.000	0.000
1000	1923		9999	0.180	0.859	1.749	0.012	0.073
0	6	Signal Boards	15	0.558	2.848	3.552	0.068	0.263
15	37		50	2.227	5.072	4.777	0.054	0.534
50	82		120	1.032	3.084	6.203	0.049	0.523
120	158		175	0.674	2.466	5.666	0.047	0.288
175	216		250	0.563	1.631	6.446	0.056	0.220
0	43	Skid Steer Loaders	50	0.353	0.891	1.456	0.017	0.112
50	71		120	0.798	1.903	1.711	0.020	0.197
120	153		175	0.000	0.000	0.000	0.000	0.000
175	201		250	0.000	0.000	0.000	0.000	0.000
250	277		500	0.000	0.000	0.000	0.000	0.000
500	530		750	0.000	0.000	0.000	0.000	0.000
750	1000		1000	0.042	0.134	0.249	0.002	0.023
0	36	Surfacing Equipme	50	0.946	2.138	1.961	0.022	0.223
50	89		120	0.789	2.331	4.774	0.036	0.396
120	151		175	0.409	1.485	3.439	0.027	0.175
175	216		250	0.340	1.012	3.612	0.030	0.136

250	362		500	0.296	1.345	3.210	0.025	0.120
500	615		750	0.000	0.000	0.000	0.000	0.000
750	814		1000	0.000	0.000	0.000	0.000	0.000
1000	1141		9999	0.151	0.670	1.635	0.013	0.060
0	36	Sweepers/Scrubbers	50	0.165	0.929	1.159	0.022	0.086
50	78		120	0.151	0.491	1.024	0.014	0.064
120	159		175	0.578	1.271	1.011	0.011	0.130
175	204		250	0.434	1.234	2.411	0.018	0.235
250	303		500	0.357	1.222	2.770	0.022	0.159
500	848		1000	0.094	0.248	1.072	0.009	0.036
0	38	Tractors/Loaders/Excavators	50	0.343	0.950	1.783	0.022	0.124
50	83		120	1.000	2.268	1.838	0.020	0.230
120	144		175	0.400	1.195	2.290	0.018	0.219
175	204		250	0.362	1.319	2.891	0.024	0.163
250	320		500	0.262	0.709	2.944	0.026	0.101
500	575		750	0.259	0.874	2.868	0.029	0.103
750	871		1000	0.000	0.000	0.000	0.000	0.000
1000	2006		9999	0.114	0.375	1.274	0.012	0.045
0	40	Trenchers	50	0.115	0.589	0.735	0.014	0.054
50	82		120	0.251	0.778	1.620	0.022	0.103
120	144		175	0.690	1.492	1.201	0.013	0.152
175	218		250	0.384	1.058	2.232	0.015	0.193
250	359		500	0.345	1.168	2.745	0.019	0.151
500	619		750	0.250	0.727	2.373	0.017	0.103
750	860		1000	0.222	1.172	2.172	0.015	0.091
0	11	Welders	15	0.592	1.924	3.359	0.037	0.265
15	20		25	0.683	1.682	2.643	0.030	0.209
25	46		50	1.390	3.120	2.799	0.031	0.325
50	70		120	0.620	1.818	3.661	0.028	0.317
120	174		175	0.405	1.452	3.344	0.027	0.175
175	211		250	0.282	0.806	3.150	0.027	0.111
250	297		500	0.250	1.030	2.852	0.023	0.100
0	29	Water Trucks	50	3.482	12.035	26.541	0.204	1.569
50	87		120	1.071	2.822	11.177	0.091	0.412
120	159		175	0.864	2.918	8.729	0.071	0.332
175	211		250	1.065	3.564	10.997	0.089	0.412
250	372		500	0.000	0.000	0.000	0.000	0.000
500	656		750	0.000	0.000	0.000	0.000	0.000
750	897		1000	0.000	0.000	0.000	0.000	0.000
1000	1764		9999	0.206	0.728	2.230	0.015	0.072

2017

AvgHP

0

50

2017		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	
Equipment	MaxHP	ROG	CO	NOX	SOX	PM	
46	Aerial Lifts	50	0.067	0.866	1.069	0.002	0.024
74		120	0.046	0.778	0.728	0.002	0.026

120	130		175	0.046	0.778	0.576	0.002	0.025
175	210		250	0.355	0.778	3.657	0.002	0.190
250	380		500	0.079	0.778	1.436	0.002	0.032
0	12	Air Compressors	15	0.380	1.730	2.364	0.004	0.134
15	24		25	0.401	1.235	2.281	0.003	0.119
25	37		50	0.751	2.770	2.404	0.004	0.190
50	78		120	0.340	1.831	2.215	0.003	0.179
120	147		175	0.242	1.554	1.847	0.003	0.099
175	218		250	0.171	0.564	1.612	0.003	0.050
250	385		500	0.162	0.544	1.401	0.003	0.047
500	595		750	0.163	0.544	1.448	0.003	0.048
750	808		1000	0.183	0.605	2.276	0.003	0.062
0	39	Bore/Drill Rigs	50	0.423	1.195	2.544	0.003	0.176
50	82		120	0.157	1.028	1.852	0.002	0.106
120	149		175	0.129	1.067	1.499	0.003	0.066
175	208		250	0.091	1.047	1.267	0.002	0.036
250	349		500	0.087	1.037	1.190	0.002	0.036
500	612		750	0.081	1.070	1.084	0.003	0.036
750	919		1000	0.063	1.055	1.518	0.003	0.030
1000	2667		9999	0.099	1.056	2.156	0.003	0.054
0	9	Cement and Mortar	15	0.371	1.943	2.321	0.005	0.093
15	25		25	0.430	1.381	2.558	0.004	0.121
0	18	Concrete/Industrial	25	0.500	1.708	3.163	0.005	0.118
25	33		50	0.859	3.574	3.396	0.005	0.229
50	81		120	0.408	2.625	2.983	0.005	0.215
120	175		175	0.289	2.243	2.422	0.005	0.121
0	41	Cranes	50	0.655	0.826	1.770	0.002	0.179
50	89		120	0.331	0.749	2.637	0.001	0.195
120	148		175	0.210	0.757	2.120	0.001	0.114
175	217		250	0.169	0.754	1.917	0.001	0.085
250	336		500	0.124	0.753	1.507	0.001	0.061
500	567		750	0.086	0.751	1.198	0.001	0.042
750	938		1000	0.316	0.748	3.359	0.001	0.167
1000	1030		9999	0.046	0.752	0.669	0.001	0.017
0	43	Crawler Tractors	50	1.104	1.328	2.662	0.002	0.305
50	87		120	0.381	1.227	3.062	0.002	0.259
120	150		175	0.276	1.215	2.809	0.002	0.156
175	203		250	0.193	1.219	2.470	0.002	0.094
250	341		500	0.173	1.225	2.157	0.002	0.083
500	570		750	0.146	1.217	1.870	0.002	0.068
750	828		1000	0.218	1.224	3.230	0.002	0.096
1000	1527		9999	0.157	1.168	2.622	0.002	0.070
0	45	Crushing/Proc. Eq	50	1.095	4.387	3.765	0.006	0.277
50	85		120	0.506	2.958	3.312	0.005	0.258
120	171		175	0.366	2.525	2.693	0.005	0.145
175	250		250	0.266	0.905	2.331	0.005	0.073
250	382		500	0.253	0.873	2.030	0.004	0.069
500	602		750	0.252	0.870	2.078	0.004	0.069
750	1337		9999	0.295	0.960	3.450	0.004	0.091
0	16	Dumpers/Tenders	25	0.261	0.889	1.658	0.003	0.065
0	36	Excavators	50	0.308	1.083	1.787	0.002	0.127
50	82		120	0.176	0.963	1.673	0.002	0.118

120	146		175	0.133	0.973	1.413	0.002	0.070
175	218		250	0.099	0.973	1.267	0.002	0.040
250	329		500	0.080	0.969	0.957	0.002	0.031
500	578		750	0.084	0.965	1.039	0.002	0.034
750	843		1000	0.099	0.962	1.805	0.002	0.043
1000	1569		9999	0.093	0.963	1.398	0.002	0.037
0	42	Forklifts	50	0.358	0.638	1.096	0.001	0.108
50	82		120	0.141	0.572	1.169	0.001	0.096
120	141		175	0.107	0.573	1.078	0.001	0.059
175	208		250	0.104	0.574	1.156	0.001	0.051
250	344		500	0.071	0.575	0.760	0.001	0.032
500	880		1000	0.327	0.573	3.140	0.001	0.175
0	11	Generator Sets	15	0.522	2.667	3.615	0.007	0.190
15	19		25	0.563	1.903	3.517	0.005	0.176
25	33		50	0.793	3.242	3.431	0.005	0.225
50	84		120	0.406	2.564	3.147	0.005	0.216
120	153		175	0.277	2.179	2.626	0.005	0.119
175	229		250	0.190	0.792	2.285	0.005	0.064
250	363		500	0.173	0.780	2.021	0.004	0.060
500	586		750	0.178	0.780	2.086	0.004	0.061
750	1130		9999	0.234	0.866	3.281	0.004	0.081
0	39	Graders	50	1.286	1.158	2.625	0.002	0.345
50	91		120	0.498	1.104	3.756	0.002	0.310
120	148		175	0.324	1.128	3.132	0.002	0.176
175	204		250	0.169	1.121	2.258	0.002	0.074
250	293		500	0.143	1.110	1.454	0.002	0.057
500	796		1000	0.303	1.109	3.798	0.002	0.132
1000	1993		9999	0.196	1.107	2.703	0.002	0.083
0	38	Off-Highway Tractor	50	0.613	1.303	2.264	0.002	0.202
50	75		120	0.267	1.179	2.316	0.002	0.184
120	158		175	0.162	1.174	1.753	0.002	0.089
175	214		250	0.149	1.167	1.908	0.002	0.066
250	334		500	0.099	1.167	1.173	0.002	0.041
500	574		750	0.113	1.170	1.447	0.002	0.049
750	1000		1000	0.054	1.172	1.019	0.002	0.026
1000	1726		9999	0.102	1.200	1.643	0.002	0.042
0	29	Off-Highway Truck	50	0.574	0.654	2.114	0.002	0.202
50	87		120	0.232	0.596	1.829	0.002	0.145
120	159		175	0.176	0.602	1.618	0.002	0.089
175	211		250	0.167	0.600	1.668	0.002	0.072
250	372		500	0.130	0.609	1.401	0.002	0.052
500	656		750	0.157	0.607	1.626	0.002	0.065
750	897		1000	0.145	0.603	2.159	0.002	0.061
1000	1764		9999	0.149	0.609	1.970	0.002	0.058
0	38	Other Construction	50	0.541	1.337	2.252	0.002	0.198
50	82		120	0.294	1.192	2.521	0.002	0.197
120	152		175	0.218	1.189	2.282	0.002	0.121
175	217		250	0.154	1.203	2.005	0.002	0.074
250	357		500	0.126	1.201	1.569	0.002	0.057
500	598		750	0.106	1.196	1.476	0.002	0.048
750	830		1000	0.078	1.190	1.590	0.002	0.038
1000	1127		9999	0.115	1.167	1.853	0.002	0.050

0	35	Other General Indu	50	0.483	0.972	1.803	0.002	0.164
50	73		120	0.236	0.869	1.955	0.002	0.161
120	149		175	0.156	0.872	1.549	0.002	0.085
175	209		250	0.147	0.875	1.716	0.002	0.068
250	355		500	0.119	0.874	1.349	0.002	0.052
500	592		750	0.078	0.875	0.886	0.002	0.029
750	885		1000	0.090	0.872	1.636	0.002	0.039
1000	2000		9999	0.094	0.872	1.534	0.002	0.042
0	36	Other Material Har	50	0.668	1.196	2.204	0.002	0.216
50	93		120	0.202	1.081	1.803	0.002	0.135
120	145		175	0.177	1.078	1.774	0.002	0.094
175	218		250	0.149	1.076	1.860	0.002	0.064
250	331		500	0.135	1.074	1.570	0.002	0.061
500	565		750	0.102	1.078	1.242	0.002	0.046
750	923		1000	0.027	1.078	0.908	0.002	0.007
1000	1050		9999	0.070	1.078	1.392	0.002	0.029
0	39	Pavers	50	0.752	1.429	2.258	0.002	0.224
50	80		120	0.272	1.274	2.365	0.002	0.182
120	158		175	0.169	1.282	1.808	0.002	0.089
175	213		250	0.091	1.283	1.582	0.002	0.041
250	327		500	0.073	1.263	1.033	0.002	0.036
500	750		750	0.082	1.280	1.024	0.002	0.045
0	35	Paving Equipment	50	0.344	1.292	1.679	0.002	0.128
50	89		120	0.209	1.178	1.849	0.002	0.139
120	148		175	0.127	1.171	1.384	0.002	0.069
175	216		250	0.107	1.174	1.463	0.002	0.050
250	339		500	0.106	1.165	1.416	0.002	0.051
500	605		750	0.077	1.174	1.192	0.002	0.029
750	842		1000	0.087	1.175	1.652	0.002	0.041
0	8	Plate Compactors	15	0.284	1.492	1.781	0.004	0.070
0	13	Pressure Washers	15	0.211	1.081	1.465	0.003	0.077
15	19		25	0.228	0.772	1.426	0.002	0.072
25	38		50	0.240	1.105	1.338	0.002	0.077
50	64		120	0.140	0.989	1.217	0.002	0.074
0	8	Pumps	15	0.586	2.667	3.645	0.007	0.207
15	21		25	0.618	1.903	3.517	0.005	0.184
25	37		50	0.860	3.416	3.475	0.005	0.237
50	84		120	0.426	2.606	3.196	0.005	0.227
120	151		175	0.293	2.213	2.668	0.005	0.125
175	217		250	0.202	0.805	2.323	0.005	0.066
250	372		500	0.185	0.791	2.047	0.004	0.062
500	615		750	0.189	0.791	2.113	0.004	0.063
750	1460		9999	0.243	0.879	3.320	0.004	0.083
0	36	Rollers	50	0.470	1.180	1.913	0.002	0.163
50	87		120	0.228	1.063	2.030	0.002	0.147
120	144		175	0.123	1.059	1.453	0.002	0.068
175	213		250	0.108	1.062	1.471	0.002	0.049
250	335		500	0.117	1.075	1.441	0.002	0.056
500	521		750	0.028	1.061	0.261	0.002	0.003
0	47	Rough Terrain For	50	0.466	1.273	1.971	0.002	0.154
50	96		120	0.114	1.145	1.374	0.002	0.073
120	130		175	0.082	1.142	1.166	0.002	0.045

175	208		250	0.062	1.145	0.995	0.002	0.024
250	374		500	0.077	1.132	1.434	0.002	0.032
500	625		750	0.038	1.143	0.531	0.002	0.004
0	42	Rubber Tired Doze	50	0.849	1.082	2.195	0.002	0.244
50	82		120	0.453	0.980	3.390	0.002	0.298
120	150		175	0.373	0.969	3.609	0.002	0.207
175	211		250	0.292	0.973	3.032	0.002	0.148
250	354		500	0.274	0.982	2.899	0.002	0.135
500	584		750	0.218	0.969	2.835	0.002	0.103
0	42	Rubber Tired Load	50	0.741	0.988	2.154	0.002	0.229
50	86		120	0.287	0.878	2.256	0.002	0.192
120	150		175	0.197	0.888	1.880	0.002	0.105
175	206		250	0.141	0.885	1.720	0.002	0.059
250	320		500	0.140	0.879	1.539	0.002	0.058
500	600		750	0.139	0.865	1.465	0.002	0.058
750	837		1000	0.157	0.887	2.371	0.002	0.069
1000	1521		9999	0.093	0.884	1.614	0.002	0.039
0	36	Scrapers	50	1.669	1.260	3.275	0.003	0.445
50	84		120	0.380	1.168	3.463	0.002	0.266
120	166		175	0.318	1.154	3.218	0.002	0.173
175	225		250	0.317	1.130	3.569	0.002	0.160
250	381		500	0.215	1.139	2.576	0.002	0.103
500	565		750	0.164	1.139	2.034	0.002	0.075
750	950		1000	0.593	1.138	6.460	0.002	0.301
1000	1923		9999	0.275	1.163	3.631	0.002	0.140
0	6	Signal Boards	15	0.542	2.845	3.397	0.007	0.133
15	37		50	0.905	3.733	3.580	0.006	0.239
50	82		120	0.432	2.782	3.167	0.005	0.227
120	158		175	0.304	2.375	2.579	0.005	0.126
175	216		250	0.258	1.032	2.694	0.006	0.079
0	43	Skid Steer Loaders	50	0.219	1.378	1.516	0.002	0.080
50	71		120	0.098	1.233	1.211	0.002	0.065
120	153		175	0.100	1.223	1.226	0.002	0.057
175	201		250	0.100	1.213	1.310	0.002	0.049
250	277		500	0.040	1.201	0.510	0.002	0.013
500	530		750	0.061	1.233	0.893	0.002	0.038
750	1000		1000	0.098	1.233	1.505	0.002	0.048
0	36	Surfacing Equipme	50	0.293	0.849	1.527	0.002	0.110
50	89		120	0.160	0.749	1.490	0.002	0.102
120	151		175	0.144	0.746	1.626	0.001	0.080
175	216		250	0.086	0.755	1.347	0.002	0.039
250	362		500	0.064	0.747	0.937	0.002	0.031
500	615		750	0.051	0.751	0.835	0.002	0.027
750	814		1000	0.096	0.752	1.744	0.002	0.043
1000	1141		9999	0.056	0.737	1.166	0.001	0.027
0	36	Sweepers/Scrubbe	50	0.816	1.544	2.563	0.003	0.265
50	78		120	0.344	1.393	2.743	0.002	0.237
120	159		175	0.339	1.390	3.383	0.002	0.180
175	204		250	0.244	1.381	2.965	0.002	0.120
250	303		500	0.230	1.387	2.773	0.002	0.122
500	848		1000	0.096	1.387	1.882	0.002	0.051
0	38	Tractors/Loaders/E	50	0.461	0.987	1.883	0.002	0.160



50	83		120	0.193	0.911	1.772	0.002	0.133
120	144		175	0.136	0.895	1.429	0.002	0.073
175	204		250	0.112	0.900	1.489	0.002	0.049
250	320		500	0.105	0.900	1.286	0.002	0.045
500	575		750	0.114	0.893	1.423	0.002	0.051
750	871		1000	0.075	0.912	1.427	0.002	0.033
1000	2006		9999	0.107	0.904	1.709	0.002	0.048
0	40	Trenchers	50	0.604	1.636	2.596	0.003	0.226
50	82		120	0.401	1.473	3.356	0.003	0.263
120	144		175	0.282	1.449	2.978	0.002	0.151
175	218		250	0.255	1.465	3.113	0.003	0.126
250	359		500	0.140	1.458	1.729	0.003	0.065
500	619		750	0.060	1.471	0.718	0.003	0.023
750	860		1000	0.602	1.462	6.635	0.003	0.303
0	11	Welders	15	0.356	1.622	2.216	0.004	0.126
15	20		25	0.376	1.157	2.139	0.003	0.112
25	46		50	0.651	2.422	2.204	0.003	0.168
50	70		120	0.299	1.670	2.036	0.003	0.159
120	174		175	0.210	1.417	1.700	0.003	0.088
175	211		250	0.147	0.515	1.483	0.003	0.045
250	297		500	0.137	0.500	1.293	0.003	0.042
0	29	Water Trucks	50	0.574	0.654	2.114	0.002	0.202
50	87		120	0.232	0.596	1.829	0.002	0.145
120	159		175	0.176	0.602	1.618	0.002	0.089
175	211		250	0.167	0.600	1.668	0.002	0.072
250	372		500	0.130	0.609	1.401	0.002	0.052
500	656		750	0.157	0.607	1.626	0.002	0.065
750	897		1000	0.145	0.603	2.159	0.002	0.061
1000	1764		9999	0.149	0.609	1.970	0.002	0.058

Equipment, Dumpers/Tenders, Generator Sets, Plate Compactors, Pressure Washers, Pumps, Signal Boards, Water Trucks, and Welders)

categories)

g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
CO2	ROG	CO	NOX	SOX	PM	CO2
85.116	5.77	24.71	37.92	0.57	2.71	3,924.79
67.164	12.68	31.62	50.98	0.59	3.98	4,971.41
68.185	39.92	92.67	94.05	1.07	9.92	8,896.20
82.234	38.22	116.68	235.60	1.89	18.95	17,269.09
254.079	85.64	352.47	1,035.89	8.84	33.99	96,549.89
273.029	7.58	24.63	42.99	0.48	3.40	3,276.35
273.029	17.47	43.06	67.67	0.78	5.35	6,552.70
273.029	59.75	132.43	112.39	1.22	13.64	10,102.07
273.029	53.81	155.08	311.54	2.33	27.98	21,296.27
273.029	66.48	233.33	536.34	4.21	29.07	40,135.28
273.029	68.57	191.95	749.17	6.25	27.10	59,520.34
273.029	106.98	429.08	1,191.50	9.63	43.07	105,116.19
273.029	169.10	663.12	1,886.67	15.25	67.35	162,452.30
273.029	281.46	1,105.43	3,015.58	20.70	98.69	220,607.43
119.487	5.94	28.65	39.19	0.68	2.81	4,692.69
88.089	10.76	32.25	66.05	0.86	4.27	7,252.33
94.779	52.08	138.16	137.35	1.70	14.43	14,078.06
168.382	63.25	230.82	401.49	3.83	35.48	34,981.86
183.260	72.46	341.92	661.21	6.72	33.77	63,991.20
139.423	55.12	161.92	828.71	8.96	20.77	85,321.61
153.653	77.62	260.60	1,125.68	12.94	31.86	141,207.22
104.626	162.02	514.89	2,350.30	26.18	65.09	279,001.60
318.534	4.47	18.39	28.85	0.42	2.09	2,866.81
318.534	20.48	50.96	81.71	0.94	6.39	7,963.35
415.232	10.32	31.96	66.56	0.89	4.25	7,474.17
415.232	72.56	163.90	149.50	1.65	17.09	13,702.65
415.232	79.68	236.54	478.98	3.68	40.60	33,633.76
415.232	112.85	408.43	945.66	7.63	48.39	72,665.55
258.865	74.11	160.63	122.70	1.27	16.18	10,517.31
255.738	64.00	177.16	360.40	2.49	33.81	22,746.73
246.433	67.77	227.88	527.20	3.83	30.10	36,443.69
234.444	71.21	198.27	702.68	5.34	28.64	50,874.41
243.055	101.53	423.34	1,009.71	7.48	40.84	81,692.54
242.351	173.00	712.33	1,736.88	12.90	69.43	137,458.80
0.000						
427.436	614.23	2,603.77	6,373.92	41.32	215.02	440,259.30
265.471	82.12	176.98	133.21	1.36	17.77	11,285.19
343.682	87.98	239.79	494.28	3.27	45.88	29,851.20
367.587	107.60	358.16	829.15	5.77	47.92	54,969.88
371.494	114.01	319.94	1,089.55	7.91	46.35	75,356.01
345.134	157.83	748.46	1,526.58	10.77	63.79	117,584.50
369.713	285.71	1,341.66	2,791.61	19.78	115.40	210,778.44
0.000						

195.553	443.73	2,109.10	4,482.45	28.01	159.82	298,511.82
443.672	123.30	272.06	223.96	2.41	27.83	19,965.26
443.672	97.22	278.39	556.65	4.13	51.12	37,712.14
443.672	128.49	447.06	1,023.48	7.97	56.69	75,867.94
443.672	129.39	357.71	1,407.72	11.65	51.09	110,918.08
443.672	174.51	685.87	1,925.70	15.53	70.22	169,482.83
443.672	278.11	1,037.65	3,110.19	25.06	110.40	267,090.80
443.672	764.82	2,926.45	8,180.59	55.67	266.72	593,189.83
216.148	7.02	18.77	33.50	0.41	2.42	3,458.37
208.660	9.65	30.86	64.66	0.88	4.12	7,457.11
138.765	74.04	165.82	128.42	1.37	16.71	11,347.77
228.669	86.97	252.73	486.79	3.66	47.75	33,394.87
232.995	87.19	307.76	677.52	5.35	39.41	50,902.87
219.014	83.79	223.83	904.16	7.56	32.41	71,977.28
183.446	110.18	374.88	1,159.90	9.71	43.03	106,020.62
0.000						
111.990	185.09	621.35	1,984.87	16.49	72.55	175,728.27
156.923	44.70	98.63	75.66	0.80	9.98	6,655.08
171.952	37.61	106.89	204.66	1.55	20.82	14,163.38
179.962	44.57	151.85	338.01	2.67	20.21	25,425.82
168.058	37.30	94.41	431.00	3.67	13.96	34,981.85
0.000						
57.204	47.77	139.86	540.58	4.61	18.41	50,339.72
420.920	9.27	34.81	59.21	0.67	3.92	4,630.12
420.920	16.43	52.56	82.59	0.95	5.86	7,997.47
420.920	59.97	140.19	146.04	1.68	15.10	13,890.35
420.920	76.83	236.37	477.78	3.87	37.84	35,357.26
420.920	91.08	344.11	794.78	6.76	37.96	64,400.73
420.920	93.93	282.06	1,120.47	10.12	35.92	96,390.62
420.920	133.33	536.97	1,629.46	14.00	52.64	152,793.90
420.920	222.15	866.84	2,695.71	23.15	86.04	246,659.08
420.920	560.98	2,079.03	6,131.17	44.64	199.95	475,639.29
318.965	83.21	183.08	142.85	1.51	18.49	12,491.08
373.677	91.61	259.95	518.91	3.72	48.80	34,003.49
379.933	99.76	344.83	782.98	5.90	44.58	56,209.86
382.031	100.79	279.05	1,034.35	8.20	40.26	78,069.24
355.058	119.10	481.21	1,223.97	9.54	47.87	104,092.32
0.000						
110.562	255.91	1,018.56	2,657.16	20.68	102.57	220,328.73
1128.991	133.67	354.50	753.09	4.66	67.90	42,518.60
793.735	124.84	405.26	956.04	6.21	55.19	59,156.29
374.226	101.82	289.70	923.26	6.21	42.01	59,156.27
1205.092	395.37	2,114.60	3,707.65	24.18	160.98	257,699.48
0.000						
0.000						
0.000						
213.965	606.47	3,265.59	5,875.26	34.66	223.58	369,357.03
1947.088	101.48	350.69	773.41	5.96	45.73	56,738.84
867.695	93.28	245.70	973.11	7.93	35.84	75,543.74
777.452	137.29	463.62	1,387.00	11.32	52.69	123,528.55
949.548	224.81	752.02	2,320.54	18.80	86.89	200,369.21
0.000						

0.000						
0.000						
160.623	363.13	1,284.07	3,933.37	26.59	126.53	283,370.03
120.626	5.81	27.99	38.29	0.67	2.74	4,584.61
73.505	8.89	26.66	54.60	0.71	3.53	5,995.26
83.257	66.33	153.11	136.09	1.53	15.83	12,695.85
169.093	83.74	257.50	499.36	4.02	44.37	36,676.92
135.388	71.81	271.27	600.28	5.07	31.73	48,314.78
0.000						
0.000						
102.356	102.63	379.60	1,193.13	10.56	41.49	115,320.65
82.643	3.14	17.71	22.10	0.42	1.64	2,900.93
95.123	8.95	28.82	60.44	0.82	3.84	6,962.24
66.128	67.68	147.43	113.61	1.19	14.91	9,863.17
134.599	77.33	215.74	429.67	3.08	41.43	28,139.05
122.674	78.70	266.19	606.92	4.57	35.23	43,514.01
103.965	76.06	205.18	806.61	6.46	29.82	61,499.79
136.032	131.96	504.38	1,405.78	11.03	52.52	120,388.74
99.212	220.90	831.31	2,376.65	18.62	87.69	198,423.93
384.920	93.09	203.01	157.86	1.66	20.56	13,759.53
295.388	74.94	209.80	418.35	3.01	40.03	27,519.05
383.028	99.19	336.86	768.88	5.82	44.31	55,373.70
301.336	80.71	218.69	858.97	6.91	31.70	65,777.26
262.307	94.40	363.40	1,011.82	7.96	37.68	86,919.96
0.000						
0.000						
320.256	445.38	1,737.08	4,737.19	30.81	155.20	336,269.26
219.130	18.58	48.47	83.38	1.00	6.21	8,463.90
159.529	88.67	190.91	148.56	1.53	19.28	12,695.85
198.483	91.31	249.49	522.95	3.44	46.53	31,386.97
272.918	112.42	376.83	882.49	6.11	49.51	58,189.31
269.306	136.01	390.27	1,286.67	9.26	56.02	88,165.61
141.065	144.19	732.49	1,398.78	9.69	59.02	105,798.77
164.512	8.50	25.47	52.17	0.68	3.37	5,727.92
122.494	75.00	161.53	126.72	1.31	16.34	10,852.90
166.573	71.35	195.25	409.88	2.71	36.28	24,720.50
212.473	87.63	294.43	691.19	4.81	38.49	45,823.36
0.000						
0.000						
65.879	84.92	244.65	805.31	5.83	35.00	55,470.39
244.589	2.57	11.97	17.17	0.28	1.21	1,956.71
170.643	4.44	16.68	28.37	0.32	1.88	2,218.36
170.643	6.66	21.31	33.48	0.38	2.37	3,242.22
170.643	23.01	56.08	66.30	0.78	6.24	6,484.44
170.643	21.82	69.81	141.41	1.20	10.40	10,921.16
420.920	7.79	25.31	44.18	0.49	3.49	3,367.36
420.920	23.57	58.09	91.29	1.05	7.22	8,839.31
420.920	71.27	164.75	165.26	1.88	17.59	15,574.03
420.920	78.92	239.86	484.48	3.87	39.24	35,357.25
420.920	92.43	344.64	795.33	6.67	38.89	63,558.88
420.920	91.86	272.37	1,076.72	9.59	35.44	91,339.57
420.920	140.53	576.95	1,687.86	14.34	55.78	156,582.10

420.920	239.42	953.83	2,859.37	24.29	93.36	258,865.67
420.920	735.71	2,796.88	8,001.41	57.67	262.06	614,542.97
80.351	3.63	17.50	23.94	0.42	1.71	2,866.80
69.676	8.98	26.91	55.12	0.72	3.56	6,052.14
81.971	72.27	159.36	132.80	1.42	16.31	11,785.75
125.472	69.57	198.86	406.30	2.93	35.84	26,756.85
146.485	83.91	293.13	679.89	5.15	36.62	49,054.21
133.411	90.25	259.12	919.73	7.29	36.48	69,440.38
324.798	97.66	216.93	172.98	1.85	22.00	15,357.89
294.068	72.91	211.06	415.69	3.10	39.17	28,326.77
437.172	95.83	337.02	759.47	5.95	42.80	56,653.52
371.911	91.96	252.65	982.75	8.14	36.32	77,471.99
0.000						
186.206	122.29	446.94	1,304.91	10.66	49.01	116,378.64
1412.268	128.13	410.96	967.79	6.17	56.77	58,729.69
1020.078	148.23	417.59	1,325.04	8.74	60.88	83,228.35
802.660	190.10	1,019.73	1,732.28	11.01	76.69	120,144.17
857.369	287.57	1,535.29	2,649.91	16.98	116.32	180,887.36
0.000						
459.645	452.06	2,447.28	4,341.93	25.20	167.62	268,478.57
184.165	10.60	32.83	68.39	0.91	4.36	7,678.94
164.013	93.05	205.00	161.02	1.70	20.73	14,129.25
178.155	71.30	203.02	404.83	2.93	37.98	26,722.73
234.204	84.71	293.73	667.21	5.06	37.79	48,223.75
211.376	86.08	238.49	888.83	7.10	34.33	67,574.68
179.033	121.28	483.00	1,254.77	9.85	48.74	107,505.17
263.180	252.46	989.46	2,637.42	20.67	101.09	220,232.12
177.105	353.23	1,409.23	3,770.59	25.28	123.30	269,377.32
1178.450	125.92	342.53	709.50	4.66	65.35	42,592.55
796.487	131.87	438.66	1,018.89	7.05	58.62	67,165.14
571.806	145.58	410.64	1,383.38	9.98	59.40	95,014.09
648.067	197.99	956.77	1,910.09	13.36	80.29	145,797.48
0.000						
0.000						
0.000						
130.956	345.48	1,652.84	3,363.66	23.64	139.91	251,869.36
466.425	3.35	17.09	21.31	0.41	1.58	2,798.55
443.672	82.41	187.65	176.73	1.98	19.74	16,415.87
443.672	84.59	252.91	508.63	3.98	42.85	36,381.11
443.672	106.49	389.58	895.23	7.36	45.58	70,100.20
536.104	121.50	352.25	1,392.44	12.16	47.48	115,798.43
143.940	15.37	38.75	63.29	0.74	4.87	6,256.91
164.106	56.27	134.20	120.72	1.40	13.88	11,575.30
0.000						
0.000						
0.000						
0.000						
19.396	41.79	134.27	249.22	2.12	22.79	19,396.44
179.415	33.75	76.24	69.95	0.77	7.95	6,399.12
326.162	70.00	206.67	423.37	3.17	35.11	28,924.01
257.701	61.73	224.25	519.21	4.09	26.45	38,906.65
283.137	73.56	218.60	780.39	6.42	29.35	61,175.57

276.905	107.33	487.35	1,163.32	9.19	43.32	100,338.17
0.000						
0.000						
137.965	172.20	764.59	1,866.00	14.77	68.66	157,418.33
152.169	5.87	33.06	41.25	0.79	3.06	5,415.08
114.751	11.70	38.06	79.35	1.05	4.97	8,896.19
89.742	92.19	202.62	161.26	1.73	20.65	14,311.27
166.517	88.71	252.15	492.80	3.73	47.94	34,037.62
208.420	107.85	369.61	838.01	6.62	48.20	63,046.95
86.663	79.90	209.97	909.45	7.72	30.61	73,490.34
187.845	13.13	36.39	68.30	0.85	4.74	7,195.46
166.547	82.67	187.46	151.94	1.66	19.04	13,765.22
163.015	57.64	172.05	329.64	2.57	31.48	23,463.43
225.193	73.98	269.26	590.46	4.83	33.34	45,988.34
243.327	83.74	227.13	942.46	8.18	32.48	77,898.61
272.221	148.64	502.05	1,647.90	16.43	59.01	156,422.90
0.000						
116.988	227.71	753.07	2,554.85	24.64	90.05	234,634.35
96.524	4.59	23.44	29.24	0.56	2.17	3,839.47
181.964	20.62	63.84	132.97	1.77	8.48	14,931.28
103.783	99.25	214.65	172.86	1.80	21.82	14,931.27
134.766	83.95	231.07	487.43	3.22	42.14	29,435.94
182.058	123.76	418.71	984.19	6.85	54.04	65,271.00
163.272	154.91	450.00	1,469.22	10.62	63.89	101,106.10
164.194	191.12	1,008.06	1,867.91	12.94	78.34	141,207.24
255.965	6.51	21.17	36.94	0.41	2.92	2,815.61
255.965	13.65	33.64	52.87	0.61	4.18	5,119.30
255.965	63.94	143.54	128.77	1.42	14.95	11,774.38
255.965	43.39	127.27	256.29	1.96	22.21	17,917.53
255.965	70.53	252.73	581.80	4.68	30.47	44,537.87
255.965	59.55	170.00	664.74	5.67	23.43	54,008.58
255.965	74.21	305.91	847.07	6.96	29.82	76,021.53
1947.088	101.475	350.693	773.413	5.958	45.734	56738.841
867.695	93.279	245.704	973.112	7.933	35.835	75543.737
777.452	137.290	463.621	1387.002	11.316	52.692	123528.552
949.548	224.813	752.015	2320.541	18.803	86.894	200369.206
0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000
160.623	363.134	1284.070	3933.373	26.593	126.530	283370.026

g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
CO2	ROG	CO	NOX	SOX	PM	CO2
179.282	3.11	39.91	49.31	0.08	1.12	8,267
161.199	3.41	57.61	53.92	0.11	1.90	11,932

161.168	6.04	101.52	75.14	0.20	3.25	21,028
161.179	74.56	163.42	768.00	0.32	39.89	33,848
161.179	30.12	295.70	545.49	0.58	12.25	61,248
272.784	4.56	20.76	28.37	0.05	1.61	3,273
272.784	9.62	29.63	54.75	0.08	2.86	6,547
272.784	27.78	102.49	88.93	0.13	7.03	10,093
272.784	26.54	142.84	172.79	0.25	13.98	21,277
272.784	35.52	228.38	271.44	0.45	14.56	40,099
272.784	37.37	122.87	351.41	0.67	10.93	59,467
272.784	62.43	209.51	539.26	1.03	18.11	105,022
272.784	97.19	323.79	861.65	1.63	28.52	162,306
272.784	147.66	488.69	1,839.18	2.22	49.73	220,409
297.409	16.61	46.93	99.93	0.11	6.92	11,680
255.958	12.90	84.66	152.47	0.20	8.73	21,073
265.687	19.10	158.54	222.61	0.38	9.80	39,464
260.607	18.96	217.51	263.23	0.52	7.57	54,142
258.141	30.46	362.13	415.41	0.86	12.69	90,138
266.402	49.80	654.96	663.17	1.56	21.98	163,028
262.709	58.28	969.93	1,394.86	2.31	27.66	241,429
262.792	263.63	2,815.34	5,749.17	6.69	143.11	700,778
318.248	3.34	17.49	20.89	0.04	0.83	2,864
318.248	10.75	34.53	63.94	0.10	3.03	7,956
414.859	9.01	30.75	56.93	0.09	2.12	7,467
414.859	28.34	117.94	112.08	0.18	7.56	13,690
414.859	33.02	212.61	241.66	0.39	17.45	33,604
414.859	50.62	392.60	423.87	0.82	21.16	72,600
165.333	26.62	33.54	71.93	0.06	7.26	6,717
149.903	29.41	66.58	234.57	0.13	17.37	13,333
151.518	31.04	111.89	313.58	0.21	16.93	22,407
150.998	36.68	163.62	416.07	0.31	18.55	32,766
150.715	41.57	252.96	506.61	0.48	20.57	50,657
150.337	49.02	425.81	679.43	0.81	24.04	85,269
149.770	296.49	701.23	3,149.83	1.34	156.34	140,424
150.667	47.24	774.95	689.07	1.48	17.06	155,187
245.129	46.91	56.46	113.17	0.10	12.97	10,420
226.499	33.11	106.60	265.96	0.19	22.48	19,673
224.179	41.24	181.65	420.13	0.32	23.32	33,524
224.947	39.10	247.24	500.98	0.44	19.12	45,630
226.113	58.85	417.41	734.73	0.74	28.43	77,035
224.620	83.00	693.89	1,066.13	1.22	39.03	128,059
225.868	180.58	1,013.57	2,674.84	1.79	79.31	187,056
215.490	240.12	1,782.39	4,002.75	3.14	107.35	328,945
443.274	49.27	197.41	169.43	0.26	12.45	19,947
443.274	43.00	251.39	281.49	0.44	21.94	37,678
443.274	62.58	431.72	460.44	0.85	24.73	75,800
443.274	66.44	226.25	582.86	1.25	18.33	110,818
443.274	96.72	333.35	775.44	1.66	26.38	169,331
443.274	151.72	523.54	1,251.07	2.68	41.68	266,851
443.274	394.66	1,283.92	4,612.77	5.96	122.08	592,657
215.954	4.18	14.23	26.52	0.04	1.04	3,455
222.420	11.01	38.70	63.85	0.08	4.53	7,949
197.769	14.38	78.74	136.78	0.15	9.69	16,173

199.819	19.47	142.07	206.34	0.28	10.15	29,182
199.784	21.54	212.50	276.90	0.42	8.77	43,647
199.132	26.25	318.61	314.67	0.62	10.18	65,443
198.227	48.48	557.75	600.20	1.09	19.85	114,563
197.524	83.05	810.55	1,521.57	1.59	36.37	166,488
197.811	145.37	1,511.16	2,194.11	2.96	58.01	310,393
117.014	15.19	27.04	46.46	0.05	4.57	4,963
105.000	11.64	47.13	96.32	0.08	7.95	8,649
105.128	15.10	80.94	152.27	0.14	8.34	14,853
105.400	21.71	119.55	240.62	0.21	10.53	21,939
105.464	24.42	197.53	261.13	0.35	11.15	36,250
105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
420.542	5.74	29.33	39.76	0.07	2.09	4,626
420.542	10.70	36.16	66.82	0.10	3.35	7,990
420.542	26.15	107.00	113.23	0.18	7.42	13,878
420.542	34.07	215.39	264.37	0.41	18.12	35,326
420.542	42.41	333.34	401.82	0.72	18.21	64,343
420.542	43.43	181.30	523.22	1.08	14.55	96,304
420.542	62.82	283.24	733.66	1.50	21.77	152,657
420.542	104.16	457.23	1,222.40	2.48	35.74	246,438
420.542	264.41	978.67	3,707.08	4.78	91.68	475,212
223.086	50.37	45.33	102.80	0.08	13.50	8,736
212.724	45.32	100.44	341.83	0.18	28.21	19,357
217.370	47.91	166.87	463.33	0.31	26.03	32,159
216.106	34.62	229.16	461.43	0.42	15.05	44,162
213.874	41.91	325.36	426.21	0.60	16.69	62,702
213.737	241.58	882.83	3,023.02	1.62	105.21	170,135
213.348	391.03	2,206.16	5,386.81	4.06	164.95	425,161
253.337	23.09	49.08	85.28	0.09	7.60	9,541
229.108	19.92	87.84	172.58	0.16	13.72	17,075
228.194	25.64	185.56	277.15	0.34	14.11	36,072
226.938	31.92	249.64	408.10	0.46	14.08	48,529
226.807	32.97	390.20	392.35	0.72	13.58	75,852
227.450	64.71	671.07	830.13	1.25	27.93	130,451
227.753	53.92	1,171.61	1,018.86	2.17	25.60	227,753
233.221	176.84	2,071.05	2,835.69	3.84	72.86	402,598
215.970	16.73	19.05	61.59	0.06	5.88	6,293
196.923	20.23	51.91	159.25	0.16	12.65	17,145
198.777	28.03	95.62	257.07	0.30	14.16	31,584
198.324	35.19	126.71	351.99	0.40	15.21	41,849
200.987	48.42	226.62	521.74	0.71	19.37	74,851
200.491	103.21	398.15	1,066.25	1.26	42.63	131,505
199.255	129.84	541.27	1,936.85	1.71	54.50	178,777
201.280	263.24	1,075.11	3,474.59	3.39	103.14	355,096
243.278	20.56	50.83	85.58	0.09	7.54	9,246
216.850	23.97	97.23	205.64	0.17	16.09	17,687
216.217	33.18	181.26	348.03	0.31	18.39	32,971
218.794	33.39	260.90	434.97	0.45	16.02	47,457
218.484	44.96	428.63	559.91	0.74	20.49	77,969
217.608	63.08	715.00	882.30	1.24	28.51	130,059
216.552	64.87	988.30	1,319.83	1.72	31.19	179,771
212.304	129.24	1,314.99	2,087.49	2.28	55.81	239,196



199.186	16.94	34.13	63.29	0.07	5.75	6,992
177.921	17.28	63.57	143.09	0.12	11.77	13,022
178.621	23.31	130.06	231.06	0.25	12.72	26,642
179.141	30.75	182.83	358.78	0.36	14.21	37,451
179.029	42.34	310.02	478.65	0.61	18.43	63,504
179.232	46.37	517.60	523.90	1.01	17.43	106,023
178.698	79.33	772.06	1,447.46	1.51	34.61	158,148
178.698	187.46	1,744.77	3,067.75	3.41	84.39	357,397
229.351	23.89	42.74	78.77	0.08	7.71	8,198
207.401	18.80	100.73	167.97	0.18	12.57	19,322
206.802	25.53	155.86	256.48	0.29	13.59	29,897
206.479	32.46	234.96	405.95	0.43	14.07	45,071
205.960	44.57	355.79	520.15	0.65	20.11	68,248
206.729	57.59	608.45	701.10	1.11	25.73	116,716
206.729	24.91	994.72	838.36	1.82	6.88	190,811
206.729	73.41	1,131.59	1,461.09	2.07	29.98	217,066
242.604	29.06	55.20	87.23	0.09	8.66	9,371
216.215	21.63	101.37	188.19	0.16	14.46	17,207
217.541	26.74	202.66	285.95	0.33	14.07	34,401
217.800	19.31	273.57	337.33	0.44	8.83	46,438
214.409	23.87	413.53	338.18	0.67	11.89	70,193
217.241	61.79	959.87	767.75	1.56	33.92	162,931
204.478	11.98	44.98	58.45	0.07	4.44	7,119
186.409	18.54	104.36	163.83	0.16	12.29	16,516
185.284	18.89	173.74	205.33	0.26	10.26	27,497
185.875	23.08	253.29	315.61	0.38	10.84	40,087
184.356	36.06	394.61	479.78	0.60	17.33	62,452
185.776	46.62	710.18	721.23	1.07	17.37	112,395
185.931	73.46	989.20	1,390.69	1.50	34.65	156,554
244.369	2.28	11.94	14.25	0.03	0.56	1,955
170.490	2.75	14.05	19.05	0.03	1.00	2,216
170.490	4.34	14.66	27.09	0.04	1.36	3,239
170.490	9.11	42.01	50.84	0.08	2.91	6,479
170.490	8.98	63.31	77.91	0.13	4.76	10,911
420.542	4.69	21.33	29.16	0.05	1.65	3,364
420.542	12.98	39.97	73.86	0.11	3.86	8,831
420.542	31.82	126.38	128.58	0.20	8.77	15,560
420.542	35.75	218.89	268.44	0.41	19.04	35,326
420.542	44.21	334.18	402.79	0.71	18.88	63,502
420.542	43.74	174.72	504.00	1.03	14.37	91,258
420.542	68.82	294.32	761.53	1.54	23.19	156,442
420.542	116.38	486.59	1,299.71	2.60	38.99	258,633
420.542	355.27	1,283.33	4,847.36	6.17	121.48	613,991
218.562	16.78	42.10	68.24	0.07	5.83	7,798
196.955	19.78	92.36	176.36	0.16	12.78	17,108
196.072	17.72	152.20	208.98	0.27	9.73	28,191
196.778	22.96	226.56	313.72	0.40	10.35	41,963
199.192	39.03	360.13	482.54	0.64	18.86	66,704
196.512	14.58	552.23	135.72	0.98	1.77	102,285
234.006	22.04	60.17	93.19	0.11	7.26	11,065
210.608	10.98	110.33	132.34	0.19	7.03	20,287
210.021	10.60	148.01	151.16	0.26	5.84	27,217

210.537	12.96	238.51	207.16	0.42	4.95	43,857
208.148	28.62	423.23	536.24	0.74	11.90	77,824
210.233	23.87	714.57	331.72	1.25	2.29	131,396
231.359	35.30	45.00	91.27	0.09	10.17	9,621
209.578	36.96	79.99	276.62	0.16	24.30	17,100
207.198	55.90	145.07	540.17	0.30	31.05	31,014
208.085	61.67	205.36	639.75	0.42	31.32	43,902
209.870	96.92	347.57	1,026.37	0.71	47.68	74,305
207.180	127.07	566.06	1,656.04	1.16	60.06	121,014
210.210	30.89	41.20	89.82	0.08	9.55	8,765
186.770	24.69	75.64	194.35	0.15	16.51	16,090
188.858	29.62	133.17	281.94	0.27	15.71	28,328
188.325	29.06	182.29	354.21	0.37	12.07	38,777
186.930	44.70	280.94	491.93	0.57	18.54	59,760
183.927	83.48	519.21	879.98	1.05	34.74	110,444
188.685	131.33	742.27	1,984.04	1.51	58.08	157,894
188.123	141.29	1,345.15	2,454.88	2.73	58.66	286,135
279.274	60.32	45.54	118.36	0.10	16.09	10,094
258.777	32.08	98.45	292.05	0.21	22.41	21,822
255.850	52.79	191.81	534.71	0.41	28.81	42,513
250.378	71.21	254.14	802.96	0.54	36.10	56,328
252.370	81.84	434.21	982.27	0.92	39.42	96,241
252.489	92.66	643.56	1,149.13	1.36	42.46	142,644
252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
257.796	528.87	2,236.99	6,983.96	4.73	268.74	495,821
466.006	3.25	17.07	20.38	0.04	0.80	2,796
443.274	33.48	138.13	132.46	0.21	8.85	16,401
443.274	35.44	228.12	259.68	0.43	18.61	36,348
443.274	47.96	375.23	407.51	0.79	19.95	70,037
535.623	55.76	222.90	581.91	1.30	17.17	115,694
215.314	9.53	59.88	65.88	0.09	3.48	9,359
192.732	6.94	86.98	85.42	0.13	4.59	13,594
191.123	15.24	187.01	187.50	0.28	8.78	29,228
189.554	20.14	243.21	262.80	0.36	9.76	38,012
187.666	10.95	332.20	141.06	0.50	3.69	51,921
192.714	32.51	653.51	473.06	0.98	20.05	102,138
192.714	97.68	1,233.03	1,504.64	1.84	48.27	192,714
178.622	10.45	30.27	54.46	0.06	3.93	6,371
157.700	14.22	66.45	132.14	0.13	9.02	13,985
157.040	21.69	112.65	245.48	0.23	12.01	23,709
158.804	18.65	163.03	291.05	0.33	8.41	34,312
157.234	23.29	270.71	339.37	0.54	11.21	56,975
158.128	31.14	462.12	513.60	0.93	16.77	97,261
158.252	78.44	612.27	1,420.49	1.23	35.15	128,862
155.194	63.52	841.35	1,330.37	1.69	30.63	177,076
265.154	29.05	54.93	91.21	0.09	9.43	9,436
239.305	26.63	108.00	212.64	0.18	18.38	18,552
238.803	54.03	221.69	539.42	0.36	28.67	38,082
237.291	49.96	282.36	606.17	0.46	24.61	48,504
238.264	69.61	419.57	838.87	0.69	36.78	72,075
238.264	81.45	1,176.17	1,596.21	1.93	43.00	202,048
210.756	17.64	37.81	72.12	0.08	6.11	8,073

194.460	15.95	75.27	146.46	0.15	11.01	16,072
191.025	19.63	128.76	205.73	0.26	10.46	27,495
192.159	22.94	183.78	304.07	0.37	9.92	39,242
192.263	33.58	288.25	411.71	0.59	14.39	61,551
190.654	65.68	513.05	817.76	1.05	29.52	109,553
194.658	65.21	794.38	1,243.79	1.62	28.75	169,625
193.002	214.94	1,812.80	3,427.42	3.70	97.01	387,090
294.003	24.04	65.07	103.26	0.11	8.97	11,695
264.749	32.86	120.87	275.39	0.21	21.57	21,724
260.410	40.58	208.45	428.51	0.36	21.71	37,465
263.292	55.79	319.97	679.87	0.55	27.45	57,509
262.127	50.03	522.88	620.02	0.90	23.22	93,977
264.323	37.07	910.70	444.85	1.56	14.23	163,682
262.792	517.60	1,257.44	5,705.74	2.16	260.95	226,001
255.735	3.92	17.84	24.38	0.04	1.38	2,813
255.735	7.52	23.15	42.77	0.06	2.24	5,115
255.735	29.95	111.43	101.38	0.15	7.71	11,764
255.735	20.93	116.91	142.53	0.21	11.13	17,901
255.735	36.50	246.54	295.79	0.50	15.28	44,498
255.735	30.95	108.65	312.90	0.61	9.48	53,960
255.735	40.76	148.52	384.05	0.75	12.52	75,953
215.970	16.726	19.054	61.589	0.060	5.884	6293.442
196.923	20.230	51.908	159.253	0.164	12.648	17144.580
198.777	28.026	95.624	257.069	0.302	14.162	31583.527
198.324	35.187	126.705	351.991	0.400	15.209	41849.455
200.987	48.418	226.623	521.744	0.715	19.368	74851.114
200.491	103.211	398.152	1066.246	1.256	42.629	131505.380
199.255	129.838	541.275	1936.855	1.707	54.503	178777.420
201.280	263.245	1075.105	3474.591	3.391	103.144	355096.192

2007

2007 data has not been updated and not used in this model  
 (OFFROAD2007 rows were added or deleted to match OFFROAD2011 HP categories)

AvgHP	2007	Equipment	MaxHP	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
				ROG	CO	NOX	SOX
0	46	Aerial Lifts	50	0.117	0.529	0.769	0.001
50	74		120	0.160	0.408	0.672	0.001
120	130		175	0.294	0.698	0.711	0.001
175	210		250	0.174	0.551	1.090	0.001
250	380		500	0.211	0.857	2.596	0.002
0	12	Air Compressors	15	0.605	2.019	3.461	0.004
15	24		25	0.694	1.736	2.768	0.003
25	37		50	1.564	3.537	3.003	0.004
50	78		120	0.663	1.974	3.887	0.003
120	147		175	0.434	1.581	3.495	0.003
175	218		250	0.296	0.830	3.286	0.003
250	385		500	0.263	1.018	2.950	0.003
500	595		750	0.268	1.018	3.025	0.003
750	808		1000	0.331	1.267	3.634	0.003
0	39	Bore/Drill Rigs	50	0.143	0.730	0.911	0.002
50	82		120	0.122	0.380	0.769	0.001
120	149		175	0.300	0.882	0.904	0.001
175	208		250	0.264	1.094	1.838	0.002
250	349		500	0.180	0.979	1.680	0.002
500	612		750	0.084	0.262	1.211	0.002
750	919		1000	0.080	0.280	1.103	0.002
1000	2667		9999	0.057	0.191	0.791	0.001
0	9	Cement and Mortar Mixers	15	0.463	2.010	3.005	0.005
15	25		25	0.775	1.963	3.198	0.004
0	18	Concrete/Industrial Saws	25	0.541	1.737	3.531	0.005
25	33		50	2.078	4.830	4.449	0.005
50	81		120	0.926	2.884	5.702	0.005
120	175		175	0.606	2.316	5.102	0.005
0	41	Cranes	50	1.735	3.856	2.975	0.003
50	89		120	0.683	1.966	3.908	0.003
120	148		175	0.435	1.526	3.377	0.003
175	217		250	0.308	0.859	3.065	0.003
250	336		500	0.286	1.141	2.838	0.002
500	567		750	0.288	1.138	2.895	0.002
750	938		1000	0.000	0.000	0.000	0.000
1000	1030		9999	0.563	2.305	5.976	0.004
0	43	Crawler Tractors	50	1.843	4.067	3.090	0.003
50	87		120	0.964	2.725	5.500	0.004
120	150		175	0.685	2.369	5.267	0.004
175	203		250	0.532	1.495	5.102	0.004
250	341		500	0.442	2.023	4.251	0.003
500	570		750	0.477	2.167	4.647	0.004
750	828		1000	0.000	0.000	0.000	0.000

1000	1527		9999	0.276	1.275	2.840	0.002
0	45	Crushing/Proc. Equipment	50	2.643	5.961	4.916	0.006
50	85		120	1.095	3.250	6.360	0.005
120	171		175	0.719	2.604	5.710	0.005
175	250		250	0.486	1.345	5.363	0.005
250	382		500	0.431	1.635	4.787	0.004
500	602		750	0.437	1.577	4.925	0.004
750	1337		9999	0.544	2.031	5.956	0.004
0	16	Dumpers/Tenders	25	0.388	1.086	2.010	0.003
0	36	Excavators	50	0.261	0.859	1.717	0.003
50	82		120	0.839	1.957	1.541	0.002
120	146		175	0.556	1.710	3.201	0.003
175	218		250	0.373	1.403	2.888	0.003
250	329		500	0.238	0.640	2.563	0.002
500	578		750	0.180	0.599	1.868	0.002
750	843		1000	0.000	0.000	0.000	0.000
1000	1569		9999	0.111	0.366	1.178	0.001
0	42	Forklifts	50	0.978	2.239	1.747	0.002
50	82		120	0.427	1.282	2.379	0.002
120	141		175	0.295	1.070	2.230	0.002
175	208		250	0.164	0.413	1.926	0.002
250	344		500	0.000	0.000	0.000	0.000
500	880		1000	0.050	0.141	0.568	0.001
0	11	Generator Sets	15	0.804	3.112	5.200	0.007
15	19		25	0.820	2.676	4.267	0.005
25	33		50	1.741	4.172	4.366	0.005
50	84		120	0.871	2.788	5.526	0.005
120	153		175	0.566	2.236	4.962	0.005
175	229		250	0.383	1.161	4.667	0.005
250	363		500	0.343	1.368	4.271	0.004
500	586		750	0.354	1.368	4.381	0.004
750	1130		9999	0.470	1.720	5.273	0.004
0	39	Graders	50	2.008	4.550	3.591	0.004
50	91		120	0.949	2.820	5.493	0.004
120	148		175	0.636	2.311	4.986	0.004
175	204		250	0.463	1.286	4.768	0.004
250	293		500	0.384	1.491	3.928	0.003
500	796		1000	0.000	0.000	0.000	0.000
1000	1993		9999	0.121	0.464	1.255	0.001
0	38	Off-Highway Tractors	50	3.408	9.299	19.420	0.013
50	75		120	1.607	5.376	12.292	0.009
120	158		175	0.615	1.751	5.595	0.004
175	214		250	1.771	9.255	16.597	0.012
250	334		500	0.000	0.000	0.000	0.000
500	574		750	0.000	0.000	0.000	0.000
750	1000		1000	0.000	0.000	0.000	0.000
1000	1726		9999	0.336	1.773	3.305	0.002
0	29	Off-Highway Trucks	50	3.264	11.982	24.736	0.022
50	87		120	1.006	2.651	10.421	0.010
120	159		175	0.818	2.692	8.140	0.008
175	211		250	1.008	3.287	10.257	0.010
250	372		500	0.000	0.000	0.000	0.000

500	656		750	0.000	0.000	0.000	0.000
750	897		1000	0.000	0.000	0.000	0.000
1000	1764		9999	0.194	0.671	2.142	0.002
0	38	Other Construction Equipment	50	0.144	0.737	0.919	0.002
50	82		120	0.102	0.317	0.642	0.001
120	152		175	0.403	0.970	0.875	0.001
175	217		250	0.358	1.173	2.212	0.002
250	357		500	0.186	0.757	1.565	0.002
500	598		750	0.000	0.000	0.000	0.000
750	830		1000	0.000	0.000	0.000	0.000
1000	1127		9999	0.084	0.309	0.985	0.001
0	35	Other General Industrial Equipmen	50	0.086	0.505	0.607	0.001
50	73		120	0.119	0.392	0.784	0.001
120	149		175	0.438	0.975	0.754	0.001
175	209		250	0.356	1.025	1.999	0.002
250	355		500	0.214	0.748	1.639	0.001
500	592		750	0.122	0.327	1.304	0.001
750	885		1000	0.142	0.521	1.514	0.001
1000	2000		9999	0.105	0.380	1.134	0.001
0	36	Other Material Handling Equipment	50	2.517	5.603	4.370	0.005
50	93		120	0.775	2.238	4.369	0.003
120	145		175	0.661	2.322	5.096	0.004
175	218		250	0.350	0.945	3.765	0.003
250	331		500	0.272	1.002	2.911	0.003
500	565		750	0.000	0.000	0.000	0.000
750	923		1000	0.000	0.000	0.000	0.000
1000	1050		9999	0.405	1.531	4.395	0.003
0	39	Pavers	50	0.431	1.170	2.079	0.003
50	80		120	1.071	2.352	1.842	0.002
120	158		175	0.551	1.557	3.201	0.002
175	213		250	0.503	1.746	3.946	0.003
250	327		500	0.393	1.131	3.745	0.003
500	750		750	0.183	0.900	1.775	0.001
0	35	Paving Equipment	50	0.228	0.709	1.437	0.002
50	89		120	0.815	1.789	1.412	0.002
120	148		175	0.459	1.298	2.673	0.002
175	216		250	0.388	1.348	3.057	0.002
250	339		500	0.000	0.000	0.000	0.000
500	605		750	0.000	0.000	0.000	0.000
750	842		1000	0.095	0.275	0.912	0.001
0	8	Plate Compactors	15	0.305	1.493	1.990	0.004
0	13	Pressure Washers	15	0.326	1.262	2.108	0.003
15	19		25	0.333	1.085	1.730	0.002
25	38		50	0.576	1.444	1.720	0.002
50	64		120	0.323	1.080	2.146	0.002
0	8	Pumps	15	0.933	3.112	5.336	0.007
15	21		25	1.070	2.676	4.267	0.005
25	37		50	1.849	4.377	4.407	0.005
50	84		120	0.896	2.830	5.604	0.005
120	151		175	0.583	2.269	5.033	0.005
175	217		250	0.396	1.183	4.735	0.005
250	372		500	0.354	1.431	4.318	0.004

500	615		750	0.364	1.431	4.429	0.004
750	1460		9999	0.477	1.787	5.327	0.004
0	36	Rollers	50	0.096	0.491	0.612	0.001
50	87		120	0.097	0.300	0.608	0.001
120	144		175	0.479	1.083	0.910	0.001
175	213		250	0.309	0.920	1.839	0.001
250	335		500	0.237	0.866	1.922	0.002
500	521		750	0.162	0.469	1.672	0.002
0	47	Rough Terrain Forklifts	50	1.937	4.445	3.592	0.004
50	96		120	0.711	2.165	4.152	0.003
120	130		175	0.694	2.586	5.497	0.005
175	208		250	0.409	1.131	4.422	0.004
250	374		500	0.000	0.000	0.000	0.000
500	625		750	0.183	0.651	1.952	0.002
0	42	Rubber Tired Dozers	50	2.959	9.771	22.295	0.016
50	82		120	1.741	4.899	15.555	0.011
120	150		175	1.223	6.394	11.080	0.008
175	211		250	1.311	6.830	12.027	0.009
250	354		500	0.000	0.000	0.000	0.000
500	584		750	0.742	3.937	7.222	0.005
0	42	Rubber Tired Loaders	50	0.240	0.770	1.566	0.002
50	86		120	1.020	2.316	1.839	0.002
120	150		175	0.448	1.336	2.600	0.002
175	206		250	0.388	1.415	3.052	0.003
250	320		500	0.252	0.702	2.618	0.002
500	600		750	0.191	0.731	1.965	0.002
750	837		1000	0.284	1.074	2.965	0.003
1000	1521		9999	0.218	0.845	2.389	0.002
0	36	Scrapers	50	3.318	9.352	18.977	0.014
50	84		120	1.490	5.143	11.492	0.009
120	166		175	0.830	2.342	7.915	0.006
175	225		250	0.838	3.912	8.062	0.006
250	381		500	0.000	0.000	0.000	0.000
500	565		750	0.000	0.000	0.000	0.000
750	950		1000	0.000	0.000	0.000	0.000
1000	1923		9999	0.171	0.791	1.662	0.001
0	6	Signal Boards	15	0.546	2.848	3.428	0.007
15	37		50	2.132	4.977	4.709	0.006
50	82		120	0.981	3.054	6.014	0.005
120	158		175	0.640	2.451	5.393	0.005
175	216		250	0.525	1.534	6.128	0.006
0	43	Skid Steer Loaders	50	0.328	0.848	1.417	0.002
50	71		120	0.725	1.828	1.676	0.002
120	153		175	0.000	0.000	0.000	0.000
175	201		250	0.000	0.000	0.000	0.000
250	277		500	0.000	0.000	0.000	0.000
500	530		750	0.000	0.000	0.000	0.000
750	1000		1000	0.038	0.133	0.238	0.000
0	36	Surfacing Equipment	50	0.900	2.089	1.931	0.002
50	89		120	0.744	2.299	4.609	0.004
120	151		175	0.385	1.470	3.254	0.003
175	216		250	0.319	0.955	3.417	0.003

250	362		500	0.278	1.233	3.034	0.003
500	615		750	0.000	0.000	0.000	0.000
750	814		1000	0.000	0.000	0.000	0.000
1000	1141		9999	0.142	0.615	1.546	0.001
0	36	Sweepers/Scrubbers	50	0.159	0.929	1.119	0.002
50	78		120	0.147	0.480	0.978	0.001
120	159		175	0.548	1.238	0.994	0.001
175	204		250	0.411	1.222	2.326	0.002
250	303		500	0.338	1.218	2.615	0.002
500	848		1000	0.087	0.228	1.010	0.001
0	38	Tractors/Loaders/Backhoes	50	0.300	0.878	1.709	0.002
50	83		120	0.925	2.188	1.803	0.002
120	144		175	0.372	1.181	2.200	0.002
175	204		250	0.337	1.315	2.687	0.003
250	320		500	0.243	0.667	2.738	0.003
500	575		750	0.242	0.810	2.665	0.003
750	871		1000	0.000	0.000	0.000	0.000
1000	2006		9999	0.106	0.348	1.184	0.001
0	40	Trenchers	50	0.113	0.589	0.709	0.002
50	82		120	0.237	0.761	1.548	0.002
120	144		175	0.664	1.465	1.186	0.001
175	218		250	0.367	1.044	2.163	0.002
250	359		500	0.329	1.154	2.621	0.002
500	619		750	0.237	0.691	2.264	0.002
750	860		1000	0.211	1.086	2.070	0.002
0	11	Welders	15	0.568	1.893	3.245	0.004
15	20		25	0.651	1.627	2.595	0.003
25	46		50	1.341	3.076	2.765	0.003
50	70		120	0.594	1.803	3.560	0.003
120	174		175	0.388	1.445	3.199	0.003
175	211		250	0.265	0.759	3.009	0.003
250	297		500	0.235	0.940	2.716	0.003
0	29	Water Trucks	50	3.264	11.982	24.736	0.022
50	87		120	1.006	2.651	10.421	0.010
120	159		175	0.818	2.692	8.140	0.008
175	211		250	1.008	3.287	10.257	0.010
250	372		500	0.000	0.000	0.000	0.000
500	656		750	0.000	0.000	0.000	0.000
750	897		1000	0.000	0.000	0.000	0.000
1000	1764		9999	0.194	0.671	2.142	0.002

2018

AvgHP

0  
50

2018		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
Equipment	MaxHP	ROG	CO	NOX	SOX
Aerial Lifts	50	0.059	0.866	0.989	0.002
	120	0.039	0.778	0.636	0.002



120	130		175	0.030	0.778	0.302	0.002
175	210		250	0.356	0.778	3.662	0.002
250	380		500	0.020	0.778	0.195	0.002
0	12	Air Compressors	15	0.372	1.722	2.311	0.004
15	24		25	0.392	1.221	2.252	0.003
25	37		50	0.675	2.719	2.349	0.004
50	78		120	0.312	1.825	2.073	0.003
120	147		175	0.226	1.558	1.690	0.003
175	218		250	0.166	0.558	1.466	0.003
250	385		500	0.158	0.535	1.288	0.003
500	595		750	0.159	0.535	1.325	0.003
750	808		1000	0.177	0.591	2.177	0.003
0	39	Bore/Drill Rigs	50	0.403	1.193	2.447	0.003
50	82		120	0.141	1.033	1.708	0.002
120	149		175	0.107	1.066	1.184	0.003
175	208		250	0.081	1.043	1.082	0.002
250	349		500	0.071	1.046	0.877	0.002
500	612		750	0.066	1.054	0.844	0.003
750	919		1000	0.066	1.055	1.523	0.003
1000	2667		9999	0.101	1.056	2.160	0.003
0	9	Cement and Mortar Mixers	15	0.370	1.943	2.320	0.005
15	25		25	0.420	1.366	2.522	0.004
0	18	Concrete/Industrial Saws	25	0.500	1.708	3.163	0.005
25	33		50	0.755	3.479	3.279	0.005
50	81		120	0.364	2.608	2.740	0.005
120	175		175	0.262	2.243	2.150	0.005
0	41	Cranes	50	0.625	0.826	1.730	0.002
50	89		120	0.281	0.749	2.285	0.001
120	148		175	0.187	0.756	1.889	0.001
175	217		250	0.146	0.754	1.663	0.001
250	336		500	0.111	0.753	1.335	0.001
500	567		750	0.082	0.750	1.086	0.001
750	938		1000	0.277	0.748	2.980	0.001
1000	1030		9999	0.049	0.752	0.673	0.001
0	43	Crawler Tractors	50	1.097	1.328	2.643	0.002
50	87		120	0.358	1.226	2.883	0.002
120	150		175	0.249	1.214	2.512	0.002
175	203		250	0.179	1.218	2.268	0.002
250	341		500	0.154	1.223	1.875	0.002
500	570		750	0.133	1.217	1.644	0.002
750	828		1000	0.219	1.224	3.243	0.002
1000	1527		9999	0.159	1.168	2.632	0.002
0	45	Crushing/Proc. Equipment	50	0.956	4.260	3.632	0.006
50	85		120	0.453	2.936	3.028	0.005
120	171		175	0.333	2.523	2.378	0.005
175	250		250	0.251	0.894	2.045	0.005
250	382		500	0.242	0.858	1.803	0.004
500	602		750	0.241	0.856	1.839	0.004
750	1337		9999	0.282	0.935	3.252	0.004
0	16	Dumpers/Tenders	25	0.261	0.889	1.653	0.003
0	36	Excavators	50	0.275	1.081	1.679	0.002
50	82		120	0.147	0.964	1.437	0.002

120	146		175	0.109	0.973	1.117	0.002
175	218		250	0.081	0.972	0.991	0.002
250	329		500	0.070	0.970	0.783	0.002
500	578		750	0.075	0.967	0.865	0.002
750	843		1000	0.069	0.962	1.436	0.002
1000	1569		9999	0.058	0.963	1.175	0.002
0	42	Forklifts	50	0.293	0.638	1.015	0.001
50	82		120	0.119	0.572	1.008	0.001
120	141		175	0.090	0.573	0.890	0.001
175	208		250	0.089	0.574	0.992	0.001
250	344		500	0.059	0.575	0.607	0.001
500	880		1000	0.327	0.573	3.140	0.001
0	11	Generator Sets	15	0.509	2.655	3.536	0.007
15	19		25	0.554	1.882	3.471	0.005
25	33		50	0.714	3.185	3.347	0.005
50	84		120	0.368	2.552	2.954	0.005
120	153		175	0.254	2.182	2.411	0.005
175	229		250	0.179	0.783	2.084	0.005
250	363		500	0.166	0.767	1.860	0.004
500	586		750	0.170	0.767	1.910	0.004
750	1130		9999	0.223	0.846	3.140	0.004
0	39	Graders	50	1.201	1.158	2.526	0.002
50	91		120	0.460	1.103	3.482	0.002
120	148		175	0.283	1.125	2.699	0.002
175	204		250	0.164	1.120	2.154	0.002
250	293		500	0.139	1.109	1.367	0.002
500	796		1000	0.303	1.109	3.798	0.002
1000	1993		9999	0.200	1.107	2.716	0.002
0	38	Off-Highway Tractors	50	0.538	1.303	2.156	0.002
50	75		120	0.238	1.177	2.085	0.002
120	158		175	0.144	1.174	1.523	0.002
175	214		250	0.124	1.167	1.504	0.002
250	334		500	0.084	1.166	0.929	0.002
500	574		750	0.089	1.171	0.943	0.002
750	1000		1000	0.059	1.172	1.027	0.002
1000	1726		9999	0.107	1.200	1.650	0.002
0	29	Off-Highway Trucks	50	0.445	0.659	1.954	0.002
50	87		120	0.228	0.596	1.778	0.002
120	159		175	0.153	0.602	1.353	0.002
175	211		250	0.136	0.601	1.318	0.002
250	372		500	0.115	0.609	1.180	0.002
500	656		750	0.139	0.607	1.409	0.002
750	897		1000	0.119	0.601	1.855	0.002
1000	1764		9999	0.124	0.611	1.683	0.002
0	38	Other Construction Equipment	50	0.508	1.337	2.190	0.002
50	82		120	0.260	1.193	2.260	0.002
120	152		175	0.190	1.188	1.975	0.002
175	217		250	0.134	1.202	1.717	0.002
250	357		500	0.109	1.201	1.316	0.002
500	598		750	0.095	1.197	1.249	0.002
750	830		1000	0.081	1.190	1.592	0.002
1000	1127		9999	0.117	1.167	1.867	0.002

0	35	Other General Industrial Equipmen	50	0.413	0.972	1.701	0.002
50	73		120	0.199	0.869	1.693	0.002
120	149		175	0.114	0.872	1.106	0.002
175	209		250	0.108	0.875	1.247	0.002
250	355		500	0.091	0.874	0.993	0.002
500	592		750	0.077	0.875	0.827	0.002
750	885		1000	0.092	0.872	1.644	0.002
1000	2000		9999	0.099	0.872	1.548	0.002
0	36	Other Material Handling Equipment	50	0.533	1.196	2.049	0.002
50	93		120	0.168	1.081	1.559	0.002
120	145		175	0.135	1.078	1.317	0.002
175	218		250	0.131	1.076	1.618	0.002
250	331		500	0.122	1.074	1.393	0.002
500	565		750	0.096	1.078	1.039	0.002
750	923		1000	0.030	1.078	0.916	0.002
1000	1050		9999	0.074	1.078	1.404	0.002
0	39	Pavers	50	0.669	1.428	2.127	0.002
50	80		120	0.233	1.274	2.085	0.002
120	158		175	0.147	1.282	1.557	0.002
175	213		250	0.086	1.283	1.443	0.002
250	327		500	0.071	1.264	0.964	0.002
500	750		750	0.086	1.280	1.028	0.002
0	35	Paving Equipment	50	0.274	1.294	1.531	0.002
50	89		120	0.167	1.177	1.516	0.002
120	148		175	0.105	1.171	1.126	0.002
175	216		250	0.096	1.174	1.274	0.002
250	339		500	0.089	1.165	1.134	0.002
500	605		750	0.079	1.174	1.197	0.002
750	842		1000	0.029	1.175	0.814	0.002
0	8	Plate Compactors	15	0.284	1.492	1.781	0.004
0	13	Pressure Washers	15	0.206	1.076	1.433	0.003
15	19		25	0.225	0.763	1.407	0.002
25	38		50	0.213	1.084	1.303	0.002
50	64		120	0.125	0.984	1.143	0.002
0	8	Pumps	15	0.573	2.655	3.563	0.007
15	21		25	0.604	1.882	3.471	0.005
25	37		50	0.777	3.357	3.392	0.005
50	84		120	0.387	2.595	2.999	0.005
120	151		175	0.269	2.217	2.449	0.005
175	217		250	0.191	0.797	2.118	0.005
250	372		500	0.179	0.777	1.884	0.004
500	615		750	0.182	0.777	1.935	0.004
750	1460		9999	0.233	0.858	3.178	0.004
0	36	Rollers	50	0.418	1.180	1.817	0.002
50	87		120	0.189	1.063	1.745	0.002
120	144		175	0.104	1.059	1.194	0.002
175	213		250	0.083	1.062	1.124	0.002
250	335		500	0.096	1.076	1.162	0.002
500	521		750	0.030	1.061	0.262	0.002
0	47	Rough Terrain Forklifts	50	0.450	1.273	1.903	0.002
50	96		120	0.093	1.145	1.144	0.002
120	130		175	0.069	1.142	0.941	0.002

175	208		250	0.064	1.145	1.000	0.002
250	374		500	0.061	1.133	1.086	0.002
500	625		750	0.040	1.143	0.532	0.002
0	42	Rubber Tired Dozers	50	0.496	1.072	1.758	0.002
50	82		120	0.418	0.979	3.139	0.002
120	150		175	0.332	0.969	3.171	0.002
175	211		250	0.277	0.973	2.849	0.002
250	354		500	0.247	0.982	2.570	0.002
500	584		750	0.210	0.969	2.659	0.002
0	42	Rubber Tired Loaders	50	0.668	0.989	2.055	0.002
50	86		120	0.248	0.878	1.979	0.002
120	150		175	0.170	0.888	1.580	0.002
175	206		250	0.126	0.885	1.495	0.002
250	320		500	0.126	0.879	1.348	0.002
500	600		750	0.125	0.864	1.282	0.002
750	837		1000	0.127	0.886	2.053	0.002
1000	1521		9999	0.078	0.884	1.476	0.002
0	36	Scrapers	50	1.686	1.260	3.285	0.003
50	84		120	0.374	1.167	3.394	0.002
120	166		175	0.272	1.154	2.721	0.002
175	225		250	0.281	1.130	3.166	0.002
250	381		500	0.186	1.139	2.203	0.002
500	565		750	0.148	1.139	1.807	0.002
750	950		1000	0.593	1.138	6.460	0.002
1000	1923		9999	0.281	1.163	3.666	0.002
0	6	Signal Boards	15	0.542	2.845	3.397	0.007
15	37		50	0.795	3.633	3.453	0.006
50	82		120	0.385	2.763	2.904	0.005
120	158		175	0.274	2.374	2.285	0.005
175	216		250	0.241	1.019	2.372	0.006
0	43	Skid Steer Loaders	50	0.188	1.377	1.433	0.002
50	71		120	0.083	1.232	1.054	0.002
120	153		175	0.074	1.220	0.935	0.002
175	201		250	0.044	1.204	0.632	0.002
250	277		500	0.025	1.201	0.221	0.002
500	530		750	0.063	1.233	0.895	0.002
750	1000		1000	0.102	1.233	1.540	0.002
0	36	Surfacing Equipment	50	0.246	0.849	1.453	0.002
50	89		120	0.131	0.751	1.292	0.002
120	151		175	0.118	0.746	1.349	0.001
175	216		250	0.076	0.755	1.203	0.002
250	362		500	0.050	0.745	0.664	0.001
500	615		750	0.045	0.747	0.684	0.002
750	814		1000	0.097	0.752	1.749	0.002
1000	1141		9999	0.057	0.737	1.170	0.001
0	36	Sweepers/Scrubbers	50	0.737	1.544	2.460	0.003
50	78		120	0.286	1.393	2.340	0.002
120	159		175	0.281	1.390	2.766	0.002
175	204		250	0.167	1.381	1.960	0.002
250	303		500	0.234	1.387	2.778	0.002
500	848		1000	0.103	1.387	1.897	0.002
0	38	Tractors/Loaders/Backhoes	50	0.383	0.987	1.756	0.002

50	83		120	0.162	0.909	1.531	0.002
120	144		175	0.115	0.894	1.167	0.002
175	204		250	0.100	0.901	1.275	0.002
250	320		500	0.086	0.895	0.983	0.002
500	575		750	0.105	0.893	1.254	0.002
750	871		1000	0.070	0.911	1.425	0.002
1000	2006		9999	0.083	0.904	1.458	0.002
0	40	Trenchers	50	0.546	1.635	2.492	0.003
50	82		120	0.346	1.472	2.972	0.003
120	144		175	0.247	1.449	2.577	0.002
175	218		250	0.220	1.466	2.661	0.003
250	359		500	0.135	1.460	1.614	0.003
500	619		750	0.049	1.475	0.515	0.003
750	860		1000	0.604	1.462	6.650	0.003
0	11	Welders	15	0.349	1.614	2.167	0.004
15	20		25	0.367	1.145	2.111	0.003
25	46		50	0.589	2.380	2.153	0.003
50	70		120	0.274	1.664	1.909	0.003
120	174		175	0.195	1.421	1.558	0.003
175	211		250	0.141	0.510	1.351	0.003
250	297		500	0.134	0.492	1.190	0.003
0	29	Water Trucks	50	0.445	0.659	1.954	0.002
50	87		120	0.228	0.596	1.778	0.002
120	159		175	0.153	0.602	1.353	0.002
175	211		250	0.136	0.601	1.318	0.002
250	372		500	0.115	0.609	1.180	0.002
500	656		750	0.139	0.607	1.409	0.002
750	897		1000	0.119	0.601	1.855	0.002
1000	1764		9999	0.124	0.611	1.683	0.002

g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.054	85.116	5.41	24.40	35.45	0.06	2.48	3,924.79
0.050	67.164	11.87	30.21	49.73	0.06	3.72	4,971.40
0.072	68.185	38.34	91.13	92.83	0.12	9.38	8,896.20
0.085	82.234	36.47	115.64	229.00	0.20	17.79	17,269.09
0.082	254.079	80.21	325.50	986.55	0.95	31.08	96,549.90
0.265	273.029	7.27	24.23	41.53	0.05	3.18	3,276.35
0.211	273.029	16.65	41.65	66.43	0.08	5.06	6,552.70
0.350	273.029	57.88	130.87	111.11	0.13	12.95	10,102.07
0.339	273.029	51.69	154.01	303.17	0.25	26.43	21,296.27
0.186	273.029	63.81	232.43	513.72	0.45	27.40	40,135.27
0.113	273.029	64.62	180.97	716.34	0.67	24.65	59,520.34
0.102	273.029	101.08	391.93	1,135.65	1.03	39.37	105,116.18
0.104	273.029	159.63	605.71	1,799.98	1.63	61.63	162,452.25
0.113	273.029	267.83	1,023.73	2,936.38	2.22	91.28	220,607.45
0.066	119.487	5.61	28.65	35.76	0.07	2.58	4,692.69
0.049	88.089	10.05	31.26	63.34	0.09	4.04	7,252.34
0.088	94.779	44.56	131.05	134.27	0.18	13.08	14,078.06
0.149	168.382	54.92	227.38	381.85	0.41	30.92	34,981.86
0.085	183.260	62.92	342.01	586.74	0.72	29.54	63,991.20
0.032	139.423	51.12	160.20	741.01	0.96	19.32	85,321.59
0.033	153.653	73.91	257.56	1,013.86	1.39	29.91	141,207.18
0.023	104.626	152.65	508.89	2,109.80	2.81	60.86	279,001.63
0.212	318.534	4.17	18.09	27.04	0.04	1.91	2,866.81
0.241	318.534	19.38	49.07	79.96	0.10	6.02	7,963.35
0.225	415.232	9.74	31.26	63.57	0.09	4.05	7,474.17
0.484	415.232	68.57	159.39	146.82	0.18	15.97	13,702.65
0.465	415.232	75.04	233.64	461.86	0.39	37.65	33,633.77
0.256	415.232	106.02	405.34	892.81	0.82	44.80	72,665.51
0.373	258.865	70.51	156.66	120.87	0.14	15.17	10,517.31
0.354	255.738	60.71	174.84	347.62	0.27	31.48	22,746.74
0.189	246.433	64.34	225.60	499.35	0.41	27.91	36,443.70
0.119	234.444	66.94	186.39	665.01	0.57	25.85	50,874.44
0.110	243.055	96.06	383.61	953.74	0.80	37.05	81,692.56
0.111	242.350	163.37	645.48	1,641.91	1.38	63.05	137,458.74
0.000	0.000						
0.191	427.436	580.34	2,374.31	6,155.42	4.43	197.18	440,259.42
0.393	265.472	78.36	172.91	131.37	0.15	16.69	11,285.20
0.492	343.682	83.71	236.64	477.70	0.35	42.74	29,851.18
0.297	367.587	102.42	354.30	787.69	0.62	44.45	54,969.87
0.208	371.494	108.00	303.23	1,034.83	0.85	42.17	75,356.01
0.171	345.134	150.44	689.29	1,448.14	1.15	58.29	117,584.50
0.185	369.712	271.83	1,235.59	2,649.60	2.12	105.52	210,778.36
0.000	0.000						

0.096	195.553	420.99	1,946.71	4,334.62	3.00	147.04	298,511.81
0.586	443.672	118.93	268.23	221.21	0.26	26.37	19,965.25
0.567	443.672	93.05	276.29	540.58	0.44	48.16	37,712.15
0.312	443.672	122.93	445.28	976.43	0.85	53.29	75,867.93
0.185	443.672	121.54	336.34	1,340.82	1.25	46.26	110,918.01
0.167	443.672	164.55	624.51	1,828.50	1.66	63.98	169,482.84
0.168	443.672	262.98	949.58	2,964.92	2.69	101.17	267,090.73
0.185	443.672	727.94	2,715.69	7,962.88	5.96	247.04	593,189.60
0.137	216.148	6.20	17.37	32.15	0.04	2.20	3,458.37
0.112	208.660	9.32	30.70	61.36	0.09	3.99	7,457.11
0.189	138.765	68.60	160.02	126.03	0.15	15.50	11,347.77
0.300	228.669	81.15	249.76	467.52	0.39	43.77	33,394.85
0.165	232.995	81.45	306.58	630.86	0.57	36.09	50,902.87
0.088	219.014	78.25	210.23	842.30	0.81	29.06	71,977.29
0.067	183.446	104.01	346.35	1,079.52	1.04	38.84	106,020.56
0.000	0.000						
0.042	111.990	174.24	574.07	1,848.18	1.77	65.52	175,728.29
0.218	156.923	41.47	94.95	74.08	0.09	9.25	6,655.08
0.233	171.952	35.20	105.63	195.96	0.17	19.22	14,163.39
0.132	179.962	41.70	151.23	315.05	0.29	18.61	25,425.83
0.058	168.058	34.04	86.04	400.92	0.39	12.18	34,981.85
0.000	0.000						
0.018	57.204	44.08	124.23	500.19	0.49	16.20	50,339.74
0.332	420.920	8.84	34.23	57.20	0.07	3.65	4,630.12
0.291	420.920	15.59	50.84	81.08	0.10	5.53	7,997.48
0.432	420.920	57.45	137.67	144.06	0.18	14.25	13,890.36
0.422	420.920	73.20	234.21	464.17	0.41	35.48	35,357.28
0.232	420.920	86.56	342.11	759.16	0.72	35.53	64,400.75
0.143	420.920	87.81	265.93	1,068.80	1.08	32.73	96,390.64
0.132	420.920	124.55	496.76	1,550.49	1.50	48.09	152,793.88
0.134	420.920	207.65	801.93	2,567.09	2.48	78.65	246,659.05
0.163	420.920	531.08	1,943.41	5,958.62	4.78	184.33	475,639.51
0.442	318.965	78.62	178.17	140.61	0.16	17.30	12,491.08
0.497	373.677	86.38	256.62	499.88	0.40	45.23	34,003.50
0.278	379.933	94.15	341.96	737.66	0.63	41.19	56,209.87
0.178	382.031	94.60	262.76	974.41	0.88	36.33	78,069.24
0.148	355.057	112.61	437.21	1,151.56	1.02	43.45	104,092.31
0.000	0.000						
0.047	110.562	241.41	925.42	2,501.22	2.22	93.17	220,328.78
1.690	1128.991	128.36	350.19	731.37	0.50	63.64	42,518.60
0.691	793.735	119.80	400.69	916.12	0.67	51.48	59,156.29
0.244	374.226	97.22	276.86	884.38	0.67	38.54	59,156.28
0.693	1205.093	378.71	1,979.01	3,549.24	2.59	148.26	257,699.59
0.000	0.000						
0.000	0.000						
0.000	0.000						
0.120	213.965	579.87	3,061.08	5,706.12	3.71	206.64	369,357.05
1.434	1947.089	95.10	349.17	720.80	0.64	41.79	56,738.86
0.369	867.695	87.63	230.78	907.26	0.85	32.14	75,543.73
0.300	777.453	130.05	427.67	1,293.39	1.21	47.60	123,528.58
0.372	949.548	212.73	693.70	2,164.31	2.01	78.52	200,369.19
0.000	0.000						

0.000	0.000						
0.000	0.000						
0.066	160.623	341.61	1,183.31	3,778.28	2.85	116.57	283,369.94
0.066	120.626	5.48	27.99	34.94	0.07	2.52	4,584.61
0.041	73.505	8.31	25.84	52.36	0.08	3.34	5,995.26
0.096	83.257	61.52	147.92	133.42	0.16	14.69	12,695.85
0.188	169.093	77.68	254.36	479.82	0.43	40.68	36,676.90
0.082	135.388	66.51	270.09	558.63	0.54	29.09	48,314.78
0.000	0.000						
0.000	0.000						
0.033	102.356	94.90	348.14	1,109.49	1.13	37.37	115,320.66
0.044	82.643	3.03	17.71	21.32	0.05	1.56	2,900.93
0.051	95.123	8.71	28.67	57.36	0.09	3.72	6,962.24
0.095	66.128	65.36	145.38	112.42	0.13	14.15	9,863.18
0.187	134.599	74.46	214.35	417.96	0.33	39.17	28,139.06
0.094	122.674	75.81	265.28	581.40	0.49	33.20	43,514.01
0.046	103.965	72.12	193.62	771.53	0.69	27.12	61,499.79
0.054	136.032	125.96	461.05	1,339.94	1.18	48.02	120,388.75
0.040	99.212	210.37	759.89	2,268.28	2.00	80.29	198,423.94
0.546	384.920	89.98	200.30	156.21	0.18	19.52	13,759.52
0.406	295.388	72.18	208.47	407.04	0.32	37.87	27,519.05
0.289	383.028	95.56	335.73	736.77	0.62	41.80	55,373.68
0.132	301.336	76.47	206.34	821.82	0.74	28.83	65,777.27
0.104	262.307	89.98	332.13	964.71	0.85	34.46	86,919.90
0.000	0.000						
0.000	0.000						
0.138	320.257	425.48	1,607.54	4,614.30	3.30	144.49	336,269.46
0.147	219.130	16.66	45.17	80.29	0.11	5.68	8,463.90
0.228	159.529	85.24	187.20	146.62	0.16	18.16	12,695.85
0.275	198.483	87.12	246.17	506.23	0.37	43.48	31,386.96
0.216	272.918	107.20	372.31	841.38	0.65	46.05	58,189.32
0.156	269.306	128.69	370.14	1,225.98	0.99	51.01	88,165.63
0.072	141.065	136.97	674.97	1,331.18	1.04	53.99	105,798.74
0.092	164.512	7.94	24.69	50.02	0.07	3.19	5,727.92
0.174	122.494	72.20	158.51	125.08	0.14	15.41	10,852.90
0.229	166.573	68.09	192.58	396.62	0.29	33.92	24,720.50
0.166	212.473	83.57	290.68	659.28	0.52	35.80	45,823.38
0.000	0.000						
0.000	0.000						
0.038	65.879	80.29	231.72	767.55	0.62	31.86	55,470.41
0.140	244.589	2.44	11.95	15.92	0.03	1.12	1,956.71
0.135	170.643	4.24	16.40	27.41	0.03	1.75	2,218.36
0.118	170.643	6.32	20.61	32.87	0.04	2.24	3,242.22
0.154	170.643	21.87	54.88	65.34	0.08	5.87	6,484.44
0.152	170.643	20.70	69.12	137.32	0.13	9.72	10,921.16
0.408	420.920	7.47	24.90	42.69	0.05	3.26	3,367.36
0.325	420.920	22.47	56.19	89.61	0.11	6.82	8,839.31
0.449	420.920	68.41	161.94	163.07	0.20	16.62	15,574.04
0.438	420.920	75.28	237.71	470.76	0.41	36.83	35,357.27
0.241	420.920	87.98	342.69	759.96	0.72	36.43	63,558.91
0.149	420.920	85.99	256.79	1,027.40	1.03	32.28	91,339.60
0.137	420.920	131.52	532.28	1,606.42	1.54	50.96	156,582.13



0.139	420.920	224.15	879.98	2,723.62	2.60	85.35	258,865.67
0.165	420.920	696.92	2,608.50	7,777.98	6.18	241.61	614,543.09
0.044	80.351	3.43	17.50	21.85	0.04	1.58	2,866.81
0.039	69.676	8.39	26.08	52.85	0.08	3.37	6,052.14
0.106	81.971	68.91	155.73	130.78	0.15	15.31	11,785.75
0.156	125.472	65.80	196.19	392.08	0.31	33.32	26,756.86
0.101	146.485	79.34	290.11	643.74	0.55	33.92	49,054.22
0.063	133.411	84.55	243.90	870.24	0.78	33.01	69,440.37
0.433	324.798	91.58	210.19	169.87	0.20	20.49	15,357.89
0.376	294.068	68.48	208.59	399.93	0.33	36.23	28,326.77
0.305	437.172	89.97	335.16	712.35	0.64	39.53	56,653.54
0.156	371.911	85.20	235.57	921.04	0.87	32.41	77,471.99
0.000	0.000						
0.070	186.206	114.09	407.04	1,220.21	1.14	44.05	116,378.63
1.270	1412.268	123.04	406.34	927.14	0.66	52.81	58,729.66
0.685	1020.079	142.03	399.73	1,269.15	0.94	55.91	83,228.37
0.472	802.660	182.99	957.06	1,658.43	1.18	70.66	120,144.13
0.508	857.369	276.65	1,440.93	2,537.51	1.82	107.20	180,887.41
0.000	0.000						
0.266	459.645	433.29	2,299.84	4,218.63	2.70	155.13	268,478.45
0.100	184.165	10.01	32.12	65.31	0.10	4.16	7,678.94
0.225	164.013	87.91	199.50	158.47	0.18	19.39	14,129.25
0.235	178.155	67.20	200.45	389.99	0.31	35.20	26,722.73
0.170	234.204	79.90	291.39	628.35	0.54	34.91	48,223.76
0.097	211.376	80.68	224.42	836.96	0.76	30.95	67,574.71
0.074	179.033	114.48	438.81	1,179.95	1.06	44.21	107,505.14
0.110	263.180	237.78	898.93	2,481.43	2.21	91.76	220,232.03
0.074	177.105	332.11	1,285.26	3,633.06	2.71	112.89	269,377.16
1.686	1178.450	119.93	337.99	685.89	0.50	60.94	42,592.53
0.645	796.487	125.63	433.69	969.06	0.76	54.42	67,165.16
0.325	571.806	137.89	389.18	1,315.25	1.07	54.04	95,014.12
0.326	648.067	188.62	880.16	1,813.71	1.43	73.37	145,797.59
0.000	0.000						
0.000	0.000						
0.000	0.000						
0.067	130.956	328.57	1,520.50	3,195.63	2.53	127.93	251,869.30
0.251	466.425	3.27	17.09	20.57	0.04	1.50	2,798.55
0.503	443.672	78.89	184.14	174.25	0.21	18.62	16,415.87
0.489	443.672	80.42	250.47	493.19	0.43	40.11	36,381.13
0.270	443.672	101.06	387.23	852.16	0.79	42.59	70,100.19
0.199	536.104	113.44	331.27	1,323.73	1.30	43.07	115,798.40
0.104	143.940	14.27	36.86	61.58	0.08	4.54	6,256.92
0.181	164.106	51.16	128.96	118.20	0.15	12.80	11,575.30
0.000	0.000						
0.000	0.000						
0.000	0.000						
0.000	0.000						
0.021	19.396	38.16	132.62	238.47	0.23	20.67	19,396.44
0.209	179.415	32.10	74.50	68.87	0.08	7.46	6,399.12
0.367	326.162	66.01	203.89	408.71	0.34	32.58	28,924.02
0.162	257.701	58.15	221.96	491.25	0.44	24.46	38,906.64
0.123	283.137	68.86	206.41	738.21	0.69	26.66	61,175.59

0.109	276.905	100.73	446.93	1,099.22	0.98	39.50	100,338.18
0.000	0.000						
0.000	0.000						
0.055	137.965	161.48	701.18	1,763.64	1.58	62.62	157,418.28
0.082	152.169	5.66	33.06	39.81	0.08	2.91	5,415.07
0.062	114.751	11.37	37.22	75.81	0.11	4.79	8,896.20
0.121	89.742	87.34	197.42	158.54	0.19	19.37	14,311.27
0.219	166.517	84.07	249.87	475.42	0.40	44.83	34,037.62
0.149	208.420	102.11	368.43	790.92	0.71	44.98	63,046.94
0.032	86.663	73.66	193.69	856.51	0.83	27.11	73,490.31
0.112	187.845	11.50	33.61	65.45	0.09	4.30	7,195.46
0.213	166.547	76.46	180.80	149.03	0.18	17.64	13,765.21
0.200	163.015	53.56	170.05	316.62	0.28	28.84	23,463.43
0.150	225.193	68.76	268.45	548.64	0.52	30.55	45,988.35
0.091	243.327	77.70	213.54	876.40	0.88	29.12	77,898.62
0.093	272.221	139.30	465.18	1,531.25	1.76	53.29	156,422.89
0.000	0.000						
0.041	116.988	212.70	697.77	2,374.73	2.64	81.37	234,634.29
0.052	96.524	4.49	23.44	28.22	0.06	2.06	3,839.47
0.099	181.964	19.47	62.45	126.99	0.19	8.10	14,931.28
0.143	103.783	95.58	210.72	170.62	0.19	20.57	14,931.27
0.180	134.766	80.14	228.05	472.39	0.35	39.39	29,435.94
0.140	182.058	118.02	413.75	939.50	0.73	50.28	65,271.01
0.094	163.272	146.84	428.14	1,401.95	1.14	58.45	101,106.09
0.084	164.194	181.69	933.82	1,780.40	1.39	71.91	141,207.20
0.248	255.965	6.24	20.82	35.69	0.04	2.73	2,815.61
0.197	255.965	13.01	32.54	51.90	0.06	3.95	5,119.30
0.308	255.965	61.71	141.48	127.19	0.15	14.16	11,774.38
0.299	255.965	41.55	126.24	249.17	0.21	20.92	17,917.53
0.165	255.965	67.46	251.45	556.60	0.50	28.63	44,537.86
0.101	255.965	55.95	160.20	634.92	0.61	21.31	54,008.58
0.092	255.965	69.84	279.22	806.74	0.75	27.23	76,021.53
1.434	1947.089	95.101	349.171	720.804	0.638	41.793	56738.855
0.369	867.695	87.625	230.776	907.255	0.850	32.143	75543.727
0.300	777.453	130.047	427.667	1293.393	1.212	47.599	123528.582
0.372	949.548	212.726	693.696	2164.308	2.015	78.519	200369.187
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.066	160.623	341.606	1183.315	3778.284	2.849	116.574	283369.941

g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.017	179.282	2.70	39.91	45.62	0.08	0.77	8,267
0.018	161.199	2.91	57.61	47.08	0.11	1.30	11,932

0.010	161.168	3.87	101.52	39.37	0.20	1.27	21,028
0.190	161.179	74.67	163.42	769.12	0.32	39.94	33,848
0.003	161.179	7.63	295.70	74.21	0.58	1.03	61,248
0.127	272.784	4.46	20.66	27.73	0.05	1.53	3,273
0.115	272.784	9.41	29.30	54.04	0.08	2.76	6,547
0.173	272.784	24.97	100.59	86.91	0.13	6.42	10,093
0.160	272.784	24.37	142.32	161.73	0.25	12.52	21,277
0.089	272.784	33.17	229.02	248.40	0.45	13.16	40,099
0.046	272.784	36.14	121.71	319.49	0.67	10.05	59,467
0.044	272.784	61.01	206.15	496.05	1.03	16.86	105,022
0.044	272.784	94.78	318.60	788.26	1.63	26.43	162,306
0.058	272.784	143.02	477.35	1,759.13	2.22	47.01	220,409
0.166	296.975	15.84	46.86	96.09	0.11	6.50	11,663
0.093	257.036	11.65	85.02	140.65	0.20	7.63	21,162
0.052	265.289	15.87	158.31	175.90	0.38	7.72	39,405
0.031	259.656	16.89	216.72	224.77	0.52	6.35	53,944
0.026	260.261	24.77	365.10	306.29	0.87	9.17	90,879
0.027	262.426	40.55	645.18	516.23	1.53	16.75	160,595
0.030	262.701	60.53	969.90	1,399.95	2.31	27.90	241,422
0.054	262.792	268.09	2,815.34	5,760.59	6.69	144.07	700,778
0.092	318.248	3.33	17.49	20.88	0.04	0.82	2,864
0.115	318.248	10.49	34.16	63.06	0.10	2.88	7,956
0.118	414.859	9.01	30.75	56.93	0.09	2.13	7,467
0.203	414.859	24.90	114.82	108.20	0.18	6.69	13,690
0.188	414.859	29.49	211.21	221.95	0.39	15.20	33,604
0.106	414.859	45.90	392.50	376.33	0.82	18.61	72,600
0.180	165.325	25.39	33.54	70.28	0.06	7.30	6,717
0.168	149.962	24.99	66.61	203.23	0.13	14.94	13,338
0.101	151.476	27.70	111.86	279.37	0.21	14.96	22,401
0.072	150.973	31.61	163.60	360.91	0.31	15.62	32,761
0.054	150.814	37.47	253.13	448.75	0.48	18.11	50,690
0.039	150.250	46.28	425.56	615.85	0.81	22.36	85,220
0.146	149.761	259.69	701.19	2,794.45	1.34	136.86	140,416
0.017	150.667	50.40	774.95	693.03	1.48	17.35	155,187
0.302	245.159	46.65	56.47	112.35	0.10	12.83	10,422
0.243	226.311	31.10	106.51	250.38	0.19	21.07	19,657
0.140	224.061	37.24	181.56	375.69	0.32	20.87	33,507
0.086	224.795	36.26	247.08	460.09	0.44	17.41	45,599
0.073	225.666	52.59	416.59	638.88	0.73	24.75	76,883
0.061	224.639	75.65	693.95	937.18	1.22	34.58	128,070
0.096	225.938	181.71	1,013.88	2,685.99	1.79	79.85	187,114
0.071	215.490	242.73	1,782.39	4,018.42	3.14	108.42	328,945
0.242	443.274	43.03	191.69	163.44	0.26	10.91	19,947
0.222	443.274	38.51	249.52	257.34	0.44	18.87	37,678
0.126	443.274	57.01	431.40	406.72	0.85	21.53	75,800
0.065	443.274	62.77	223.48	511.36	1.25	16.28	110,818
0.062	443.274	92.28	327.66	688.84	1.66	23.71	169,331
0.062	443.274	144.81	515.33	1,107.37	2.68	37.37	266,851
0.084	443.274	377.13	1,250.27	4,347.38	5.96	111.93	592,657
0.064	215.954	4.18	14.23	26.45	0.04	1.03	3,455
0.109	222.094	9.82	38.64	59.99	0.08	3.88	7,937
0.096	197.948	12.03	78.81	117.54	0.15	7.82	16,188

0.054	199.828	15.94	142.08	163.06	0.28	7.91	29,183
0.030	199.658	17.63	212.36	216.41	0.42	6.58	43,620
0.025	199.188	22.94	318.70	257.35	0.63	8.34	65,462
0.029	198.598	43.63	558.80	500.07	1.10	16.76	114,778
0.029	197.497	58.28	810.44	1,210.01	1.59	24.85	166,466
0.022	197.811	90.28	1,511.16	1,843.44	2.96	34.47	310,393
0.090	117.014	12.43	27.04	43.06	0.05	3.81	4,963
0.080	105.000	9.83	47.13	83.03	0.08	6.63	8,649
0.048	105.128	12.70	80.94	125.80	0.14	6.85	14,853
0.042	105.400	18.62	119.55	206.58	0.21	8.67	21,939
0.025	105.464	20.39	197.53	208.55	0.35	8.60	36,250
0.175	105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
0.181	420.542	5.60	29.20	38.89	0.07	1.99	4,626
0.170	420.542	10.52	35.77	65.95	0.10	3.24	7,990
0.206	420.542	23.57	105.10	110.46	0.18	6.79	13,878
0.194	420.542	30.87	214.40	248.14	0.41	16.32	35,326
0.108	420.542	38.85	333.81	368.81	0.72	16.50	64,343
0.058	420.542	41.05	179.34	477.17	1.08	13.38	96,304
0.056	420.542	60.42	278.50	675.07	1.50	20.24	152,657
0.056	420.542	99.52	449.59	1,119.05	2.48	33.10	246,437
0.076	420.542	251.86	955.95	3,548.04	4.78	86.27	475,212
0.323	223.107	47.05	45.34	98.91	0.08	12.64	8,737
0.285	212.554	41.85	100.36	316.85	0.18	25.92	19,342
0.152	216.773	41.85	166.42	399.36	0.31	22.45	32,071
0.070	215.925	33.59	228.96	440.22	0.42	14.31	44,125
0.053	213.809	40.66	325.26	400.75	0.60	15.51	62,682
0.132	213.737	241.58	882.83	3,023.02	1.62	105.21	170,135
0.084	213.348	397.82	2,206.16	5,411.58	4.06	166.50	425,161
0.179	253.214	20.28	49.06	81.21	0.09	6.72	9,536
0.162	228.895	17.73	87.76	155.38	0.16	12.10	17,059
0.076	228.171	22.69	185.54	240.79	0.34	12.09	36,068
0.052	226.947	26.48	249.65	321.68	0.46	11.04	48,531
0.032	226.662	28.21	389.95	310.72	0.72	10.62	75,804
0.035	227.646	51.11	671.64	540.91	1.25	20.12	130,563
0.026	227.753	58.83	1,171.61	1,027.23	2.17	26.22	227,753
0.043	233.363	184.89	2,072.31	2,848.83	3.85	73.82	402,843
0.162	217.804	12.95	19.22	56.93	0.06	4.72	6,347
0.140	196.753	19.88	51.86	154.83	0.16	12.16	17,130
0.073	198.757	24.35	95.61	214.97	0.30	11.66	31,580
0.054	198.591	28.73	126.88	278.08	0.40	11.38	41,906
0.043	200.982	42.73	226.62	439.47	0.71	16.04	74,849
0.055	200.415	91.19	398.00	924.46	1.26	35.84	131,455
0.048	198.654	106.37	539.64	1,664.44	1.70	43.33	178,238
0.046	201.845	219.07	1,078.12	2,968.46	3.40	80.73	356,092
0.187	243.167	19.31	50.81	83.23	0.09	7.09	9,242
0.173	217.066	21.19	97.33	184.35	0.17	14.12	17,704
0.104	216.166	28.93	181.22	301.20	0.31	15.85	32,963
0.062	218.670	29.04	260.75	372.51	0.45	13.48	47,430
0.048	218.547	38.93	428.76	469.47	0.74	16.99	77,991
0.041	217.818	56.76	715.69	746.70	1.24	24.55	130,184
0.038	216.515	66.96	988.13	1,321.83	1.72	31.52	179,741
0.050	212.268	132.35	1,314.76	2,103.15	2.28	56.56	239,155

0.141	199.186	14.49	34.13	59.71	0.07	4.96	6,992
0.134	177.921	14.59	63.57	123.91	0.12	9.80	13,022
0.059	178.621	16.94	130.06	164.96	0.25	8.77	26,642
0.046	179.141	22.66	182.83	260.61	0.36	9.63	37,451
0.035	179.029	32.16	310.02	352.39	0.61	12.56	63,504
0.028	179.232	45.79	517.60	489.02	1.01	16.70	106,023
0.040	178.698	81.44	772.06	1,454.59	1.51	35.03	158,148
0.043	178.698	198.72	1,744.77	3,096.60	3.41	86.82	357,397
0.181	229.351	19.07	42.74	73.23	0.08	6.45	8,198
0.107	207.401	15.69	100.73	145.23	0.18	9.99	19,322
0.068	206.802	19.53	155.86	190.43	0.29	9.86	29,897
0.053	206.479	28.55	234.96	353.08	0.43	11.65	45,071
0.053	205.960	40.57	355.79	461.66	0.65	17.49	68,248
0.041	206.729	54.02	608.45	586.46	1.11	22.97	116,716
0.008	206.729	27.67	994.72	845.71	1.82	7.10	190,811
0.029	206.729	77.96	1,131.59	1,474.09	2.07	30.81	217,066
0.199	242.343	25.84	55.14	82.17	0.09	7.67	9,360
0.156	216.253	18.53	101.39	165.93	0.16	12.40	17,210
0.076	217.644	23.29	202.76	246.15	0.33	12.03	34,417
0.038	217.742	18.37	273.50	307.72	0.44	8.17	46,425
0.034	214.524	23.39	413.75	315.51	0.67	11.23	70,231
0.046	217.241	64.15	959.87	770.87	1.56	34.38	162,931
0.102	204.715	9.54	45.04	53.32	0.07	3.54	7,128
0.107	186.352	14.80	104.32	134.35	0.16	9.51	16,511
0.055	185.248	15.65	173.71	167.17	0.26	8.18	27,492
0.044	185.809	20.70	253.20	274.67	0.38	9.41	40,073
0.041	184.391	30.16	394.68	384.17	0.60	13.95	62,464
0.029	185.779	48.09	710.19	724.37	1.07	17.62	112,396
0.013	185.931	24.39	989.20	685.38	1.50	10.77	156,554
0.070	244.369	2.28	11.94	14.25	0.03	0.56	1,955
0.073	170.490	2.68	13.99	18.63	0.03	0.95	2,216
0.069	170.490	4.27	14.50	26.74	0.04	1.31	3,239
0.070	170.490	8.11	41.18	49.53	0.08	2.65	6,479
0.067	170.490	8.02	62.96	73.13	0.13	4.27	10,911
0.196	420.542	4.59	21.24	28.50	0.05	1.57	3,364
0.177	420.542	12.69	39.53	72.90	0.11	3.72	8,831
0.217	420.542	28.76	124.20	125.49	0.20	8.03	15,560
0.204	420.542	32.52	217.95	251.96	0.41	17.16	35,326
0.113	420.542	40.69	334.77	369.72	0.71	17.13	63,502
0.061	420.542	41.55	172.85	459.66	1.03	13.21	91,258
0.058	420.542	66.44	289.21	700.93	1.54	21.57	156,442
0.059	420.542	111.69	478.13	1,190.15	2.60	36.13	258,633
0.078	420.542	339.85	1,252.81	4,640.01	6.17	114.45	613,991
0.145	218.575	14.91	42.10	64.81	0.07	5.18	7,798
0.120	196.938	16.41	92.36	151.56	0.16	10.43	17,106
0.055	196.125	14.97	152.24	171.62	0.27	7.94	28,199
0.035	196.719	17.69	226.49	239.63	0.40	7.50	41,950
0.045	199.252	32.19	360.24	389.27	0.64	14.96	66,725
0.003	196.512	15.45	552.23	136.31	0.98	1.79	102,285
0.144	234.007	21.28	60.17	90.00	0.11	6.81	11,065
0.055	210.576	9.00	110.31	110.17	0.19	5.27	20,284
0.035	210.051	8.92	148.03	121.99	0.26	4.56	27,221

0.024	210.528	13.33	238.50	208.30	0.42	5.01	43,855
0.024	208.322	22.84	423.59	405.91	0.74	9.00	77,889
0.004	210.233	24.89	714.57	332.74	1.25	2.31	131,396
0.148	229.159	20.64	44.58	73.10	0.09	6.14	9,530
0.273	209.366	34.09	79.90	256.08	0.16	22.23	17,082
0.182	207.185	49.68	145.06	474.59	0.30	27.25	31,012
0.139	208.087	58.41	205.36	601.14	0.42	29.22	43,902
0.119	210.007	87.60	347.80	909.98	0.71	42.02	74,353
0.098	207.176	122.38	566.05	1,553.12	1.16	57.27	121,012
0.208	210.291	27.87	41.22	85.67	0.08	8.69	8,768
0.163	186.772	21.38	75.64	170.50	0.15	14.08	16,090
0.088	188.862	25.45	133.18	237.05	0.27	13.15	28,329
0.051	188.242	26.00	182.21	307.77	0.37	10.44	38,760
0.050	186.956	40.41	280.97	430.97	0.57	16.14	59,768
0.051	183.868	75.18	519.04	769.88	1.05	30.41	110,409
0.056	188.435	106.43	741.29	1,717.60	1.51	46.66	157,685
0.032	187.956	118.56	1,343.95	2,245.45	2.73	48.82	285,882
0.449	279.274	60.94	45.54	118.72	0.10	16.23	10,094
0.262	258.667	31.52	98.41	286.21	0.21	22.07	21,813
0.146	255.844	45.18	191.80	452.17	0.41	24.28	42,512
0.140	250.520	63.22	254.28	712.27	0.54	31.48	56,360
0.087	252.466	71.07	434.37	840.29	0.92	33.12	96,278
0.065	252.365	83.79	643.25	1,020.86	1.36	36.79	142,574
0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.142	257.796	540.23	2,236.99	7,051.51	4.73	273.60	495,821
0.133	466.006	3.25	17.07	20.38	0.04	0.80	2,796
0.211	443.274	29.41	134.42	127.76	0.21	7.81	16,401
0.197	443.274	31.53	226.53	238.16	0.43	16.16	36,348
0.111	443.274	43.28	375.05	361.07	0.79	17.47	70,037
0.071	535.623	52.14	220.07	512.33	1.30	15.27	115,695
0.066	215.170	8.17	59.84	62.31	0.09	2.86	9,353
0.052	192.589	5.87	86.92	74.34	0.13	3.63	13,584
0.043	190.661	11.31	186.55	143.01	0.28	6.59	29,157
0.018	188.182	8.77	241.45	126.83	0.36	3.57	37,737
0.003	187.666	6.94	332.20	61.10	0.50	0.89	51,921
0.038	192.714	33.45	653.51	474.30	0.98	20.23	102,138
0.050	192.714	102.16	1,233.03	1,540.49	1.84	49.80	192,714
0.096	178.678	8.77	30.28	51.83	0.06	3.44	6,373
0.081	157.966	11.59	66.56	114.54	0.13	7.18	14,008
0.065	157.041	17.87	112.65	203.71	0.23	9.79	23,709
0.034	158.873	16.43	163.10	259.83	0.33	7.34	34,327
0.023	156.858	18.00	270.06	240.78	0.54	8.31	56,839
0.024	157.176	27.65	459.34	420.71	0.92	14.51	96,675
0.043	158.257	79.06	612.29	1,424.30	1.23	35.39	128,866
0.027	155.194	65.09	841.35	1,334.42	1.69	30.94	177,076
0.242	265.154	26.22	54.93	87.53	0.09	8.60	9,436
0.195	239.305	22.16	108.00	181.41	0.18	15.13	18,552
0.146	238.803	44.78	221.69	441.09	0.36	23.23	38,082
0.077	237.291	34.06	282.36	400.60	0.46	15.75	48,504
0.122	238.264	70.67	419.57	840.27	0.69	36.98	72,075
0.052	238.264	87.22	1,176.17	1,608.94	1.93	44.13	202,048
0.134	210.672	14.66	37.79	67.25	0.08	5.12	8,070

0.108	194.172	13.40	75.16	126.53	0.15	8.96	16,048
0.059	190.892	16.49	128.67	168.03	0.26	8.46	27,476
0.041	192.338	20.39	183.95	260.35	0.38	8.40	39,279
0.034	191.096	27.44	286.50	314.84	0.58	10.87	61,177
0.046	190.591	60.10	512.89	720.44	1.05	26.31	109,517
0.030	194.632	60.67	794.27	1,241.98	1.62	26.13	169,602
0.035	193.002	167.23	1,812.80	2,923.39	3.70	70.03	387,090
0.206	293.844	21.73	65.03	99.14	0.11	8.18	11,688
0.226	264.562	28.40	120.79	243.91	0.21	18.55	21,709
0.131	260.387	35.59	208.43	370.69	0.36	18.89	37,462
0.106	263.409	48.13	320.11	581.22	0.55	23.25	57,534
0.061	262.372	48.27	523.36	578.50	0.90	21.84	94,065
0.014	265.059	30.61	913.24	319.02	1.57	8.91	164,138
0.305	262.792	519.77	1,257.44	5,719.12	2.16	262.41	226,001
0.119	255.735	3.83	17.76	23.83	0.04	1.31	2,813
0.108	255.735	7.35	22.89	42.22	0.06	2.15	5,115
0.154	255.735	27.08	109.48	99.05	0.15	7.06	11,764
0.143	255.735	19.20	116.49	133.64	0.21	10.03	17,901
0.080	255.735	33.97	247.18	271.17	0.50	13.86	44,498
0.041	255.735	29.78	107.57	285.03	0.61	8.72	53,960
0.039	255.735	39.75	146.06	353.48	0.75	11.66	75,953
0.162	217.804	12.953	19.216	56.932	0.061	4.724	6346.876
0.140	196.753	19.885	51.863	154.830	0.164	12.161	17129.788
0.073	198.757	24.351	95.614	214.972	0.302	11.664	31580.306
0.054	198.591	28.735	126.876	278.081	0.400	11.384	41905.682
0.043	200.982	42.726	226.616	439.472	0.715	16.041	74849.068
0.055	200.415	91.190	398.000	924.461	1.255	35.836	131455.371
0.048	198.654	106.373	539.642	1664.443	1.702	43.330	178238.088
0.046	201.845	219.074	1078.121	2968.459	3.400	80.726	356092.389

2008

2008 data has not been updated and not used in this model  
 (OFFROAD2007 rows were added or deleted to match OFFROAD2011 HP cate

2008			g/hp/hr	g/hp/hr	g/hp/hr	
AvgHP	Equipment	MaxHP	ROG	CO	NOX	
0	46	Aerial Lifts	50	0.111	0.525	0.722
50	74		120	0.149	0.388	0.654
120	130		175	0.282	0.687	0.703
175	210		250	0.165	0.546	1.046
250	380		500	0.198	0.792	2.478
0	12	Air Compressors	15	0.582	1.988	3.349
15	24		25	0.663	1.682	2.720
25	37		50	1.512	3.498	2.971
50	78		120	0.635	1.962	3.735
120	147		175	0.418	1.577	3.352
175	218		250	0.280	0.785	3.146
250	385		500	0.249	0.931	2.816
500	595		750	0.254	0.931	2.891
750	808		1000	0.316	1.175	3.539
0	39	Bore/Drill Rigs	50	0.141	0.730	0.886
50	82		120	0.116	0.371	0.740
120	149		175	0.249	0.836	0.885
175	208		250	0.223	1.078	1.653
250	349		500	0.157	0.980	1.492
500	612		750	0.078	0.260	1.084
750	919		1000	0.077	0.278	0.999
1000	2667		9999	0.055	0.189	0.713
0	9	Cement and Mortar Mixers	15	0.437	1.987	2.830
15	25		25	0.728	1.881	3.124
0	18	Concrete/Industrial Saws	25	0.520	1.716	3.387
25	33		50	1.948	4.688	4.368
50	81		120	0.866	2.849	5.393
120	175		175	0.569	2.301	4.811
0	41	Cranes	50	1.638	3.751	2.929
50	89		120	0.644	1.942	3.709
120	148		175	0.413	1.514	3.196
175	217		250	0.291	0.810	2.899
250	336		500	0.271	1.045	2.680
500	567		750	0.273	1.042	2.737
750	938		1000	0.000	0.000	0.000
1000	1030		9999	0.533	2.120	5.766
0	43	Crawler Tractors	50	1.746	3.965	3.047
50	87		120	0.911	2.688	5.231
120	150		175	0.652	2.345	4.999
175	203		250	0.505	1.418	4.841
250	341		500	0.422	1.863	4.031
500	570		750	0.455	1.996	4.409
750	828		1000	0.000	0.000	0.000



1000	1527		9999	0.262	1.177	2.742
0	45	Crushing/Proc. Equipment	50	2.539	5.873	4.858
50	85		120	1.044	3.227	6.087
120	171		175	0.689	2.596	5.454
175	250		250	0.458	1.269	5.115
250	382		500	0.408	1.492	4.553
500	602		750	0.415	1.446	4.701
750	1337		9999	0.519	1.888	5.794
0	16	Dumpers/Tenders	25	0.342	1.008	1.932
0	36	Excavators	50	0.255	0.859	1.639
50	82		120	0.767	1.883	1.513
120	146		175	0.513	1.689	2.993
175	218		250	0.348	1.399	2.684
250	329		500	0.224	0.603	2.384
500	578		750	0.171	0.556	1.739
750	843		1000	0.000	0.000	0.000
1000	1569		9999	0.105	0.339	1.097
0	42	Forklifts	50	0.888	2.138	1.706
50	82		120	0.394	1.265	2.215
120	141		175	0.274	1.066	2.062
175	208		250	0.154	0.393	1.794
250	344		500	0.000	0.000	0.000
500	880		1000	0.048	0.131	0.528
0	11	Generator Sets	15	0.769	3.064	5.031
15	19		25	0.780	2.592	4.193
25	33		50	1.663	4.098	4.308
50	84		120	0.827	2.764	5.295
120	153		175	0.539	2.225	4.746
175	229		250	0.359	1.097	4.458
250	363		500	0.321	1.267	4.071
500	586		750	0.332	1.267	4.178
750	1130		9999	0.445	1.609	5.124
0	39	Graders	50	1.881	4.418	3.534
50	91		120	0.889	2.784	5.187
120	148		175	0.601	2.295	4.694
175	204		250	0.436	1.214	4.490
250	293		500	0.365	1.362	3.697
500	796		1000	0.000	0.000	0.000
1000	1993		9999	0.115	0.424	1.182
0	38	Off-Highway Tractors	50	3.257	9.183	18.629
50	75		120	1.542	5.318	11.767
120	158		175	0.588	1.674	5.354
175	214		250	1.699	8.652	15.880
250	334		500	0.000	0.000	0.000
500	574		750	0.000	0.000	0.000
750	1000		1000	0.000	0.000	0.000
1000	1726		9999	0.321	1.660	3.206
0	29	Off-Highway Trucks	50	3.060	11.938	23.026
50	87		120	0.949	2.497	9.706
120	159		175	0.778	2.490	7.592
175	211		250	0.958	3.041	9.565
250	372		500	0.000	0.000	0.000

500	656		750	0.000	0.000	0.000
750	897		1000	0.000	0.000	0.000
1000	1764		9999	0.183	0.619	2.052
0	38	Other Construction Equipment	50	0.142	0.737	0.895
50	82		120	0.096	0.310	0.617
120	152		175	0.370	0.935	0.858
175	217		250	0.329	1.158	2.068
250	357		500	0.173	0.754	1.457
500	598		750	0.000	0.000	0.000
750	830		1000	0.000	0.000	0.000
1000	1127		9999	0.078	0.284	0.917
0	35	Other General Industrial Equipmen	50	0.086	0.505	0.602
50	73		120	0.116	0.392	0.748
120	149		175	0.421	0.960	0.746
175	209		250	0.342	1.019	1.921
250	355		500	0.206	0.746	1.571
500	592		750	0.116	0.310	1.249
750	885		1000	0.137	0.477	1.445
1000	2000		9999	0.101	0.348	1.084
0	36	Other Material Handling Equipment	50	2.423	5.524	4.326
50	93		120	0.744	2.224	4.199
120	145		175	0.638	2.316	4.888
175	218		250	0.334	0.895	3.605
250	331		500	0.260	0.918	2.780
500	565		750	0.000	0.000	0.000
750	923		1000	0.000	0.000	0.000
1000	1050		9999	0.388	1.418	4.279
0	39	Pavers	50	0.386	1.091	2.003
50	80		120	1.024	2.302	1.818
120	158		175	0.523	1.536	3.055
175	213		250	0.479	1.727	3.760
250	327		500	0.372	1.073	3.567
500	750		750	0.174	0.829	1.689
0	35	Paving Equipment	50	0.216	0.693	1.382
50	89		120	0.780	1.753	1.393
120	148		175	0.436	1.280	2.551
175	216		250	0.370	1.332	2.915
250	339		500	0.000	0.000	0.000
500	605		750	0.000	0.000	0.000
750	842		1000	0.090	0.261	0.868
0	8	Plate Compactors	15	0.292	1.493	1.862
0	13	Pressure Washers	15	0.312	1.242	2.040
15	19		25	0.316	1.051	1.700
25	38		50	0.545	1.413	1.695
50	64		120	0.305	1.070	2.053
0	8	Pumps	15	0.897	3.064	5.162
15	21		25	1.021	2.592	4.193
25	37		50	1.770	4.304	4.351
50	84		120	0.852	2.806	5.372
120	151		175	0.556	2.259	4.816
175	217		250	0.372	1.118	4.524
250	372		500	0.332	1.320	4.117

500	615		750	0.342	1.320	4.225
750	1460		9999	0.452	1.667	5.178
0	36	Rollers	50	0.095	0.491	0.596
50	87		120	0.091	0.294	0.585
120	144		175	0.453	1.056	0.895
175	213		250	0.290	0.908	1.744
250	335		500	0.224	0.859	1.820
500	521		750	0.152	0.442	1.582
0	47	Rough Terrain Forklifts	50	1.799	4.298	3.528
50	96		120	0.662	2.140	3.905
120	130		175	0.652	2.574	5.151
175	208		250	0.380	1.056	4.140
250	374		500	0.000	0.000	0.000
500	625		750	0.171	0.593	1.825
0	42	Rubber Tired Dozers	50	2.840	9.666	21.335
50	82		120	1.670	4.690	14.885
120	150		175	1.178	5.995	10.604
175	211		250	1.263	6.404	11.512
250	354		500	0.000	0.000	0.000
500	584		750	0.711	3.697	7.008
0	42	Rubber Tired Loaders	50	0.231	0.761	1.502
50	86		120	0.955	2.247	1.810
120	150		175	0.419	1.320	2.455
175	206		250	0.366	1.406	2.872
250	320		500	0.237	0.663	2.464
500	600		750	0.181	0.669	1.848
750	837		1000	0.269	0.984	2.790
1000	1521		9999	0.205	0.775	2.298
0	36	Scrapers	50	3.143	9.227	18.071
50	84		120	1.419	5.089	10.921
120	166		175	0.788	2.222	7.521
175	225		250	0.801	3.598	7.654
250	381		500	0.000	0.000	0.000
500	565		750	0.000	0.000	0.000
750	950		1000	0.000	0.000	0.000
1000	1923		9999	0.163	0.727	1.578
0	6	Signal Boards	15	0.543	2.848	3.400
15	37		50	2.036	4.888	4.646
50	82		120	0.929	3.027	5.747
120	158		175	0.609	2.439	5.143
175	216		250	0.492	1.447	5.837
0	43	Skid Steer Loaders	50	0.304	0.806	1.378
50	71		120	0.649	1.753	1.642
120	153		175	0.000	0.000	0.000
175	201		250	0.000	0.000	0.000
250	277		500	0.000	0.000	0.000
500	530		750	0.000	0.000	0.000
750	1000		1000	0.034	0.131	0.220
0	36	Surfacing Equipment	50	0.850	2.037	1.901
50	89		120	0.697	2.269	4.368
120	151		175	0.363	1.457	3.078
175	216		250	0.299	0.903	3.232

250	362		500	0.261	1.133	2.868
500	615		750	0.000	0.000	0.000
750	814		1000	0.000	0.000	0.000
1000	1141		9999	0.133	0.565	1.461
0	36	Sweepers/Scrubbers	50	0.158	0.929	1.109
50	78		120	0.143	0.474	0.938
120	159		175	0.508	1.194	0.974
175	204		250	0.384	1.208	2.185
250	303		500	0.317	1.213	2.446
500	848		1000	0.079	0.209	0.943
0	38	Tractors/Loaders/Backhoes	50	0.280	0.847	1.654
50	83		120	0.845	2.104	1.769
120	144		175	0.342	1.167	2.053
175	204		250	0.313	1.311	2.494
250	320		500	0.226	0.630	2.544
500	575		750	0.229	0.756	2.478
750	871		1000	0.000	0.000	0.000
1000	2006		9999	0.100	0.325	1.101
0	40	Trenchers	50	0.112	0.589	0.704
50	82		120	0.228	0.752	1.484
120	144		175	0.636	1.435	1.170
175	218		250	0.348	1.030	2.067
250	359		500	0.314	1.141	2.500
500	619		750	0.225	0.658	2.159
750	860		1000	0.201	1.005	1.973
0	11	Welders	15	0.545	1.863	3.139
15	20		25	0.621	1.576	2.550
25	46		50	1.292	3.034	2.733
50	70		120	0.567	1.790	3.416
120	174		175	0.372	1.440	3.065
175	211		250	0.250	0.717	2.878
250	297		500	0.222	0.859	2.591
0	29	Water Trucks	50	3.060	11.938	23.026
50	87		120	0.949	2.497	9.706
120	159		175	0.778	2.490	7.592
175	211		250	0.958	3.041	9.565
250	372		500	0.000	0.000	0.000
500	656		750	0.000	0.000	0.000
750	897		1000	0.000	0.000	0.000
1000	1764		9999	0.183	0.619	2.052

2019

		2019		g/hp/hr	g/hp/hr	g/hp/hr
AvgHP		Equipment	MaxHP	ROG	CO	NOX
0	46	Aerial Lifts	50	0.055	0.866	0.949
50	74		120	0.038	0.778	0.609

120	130		175	0.030	0.778	0.303
175	210		250	0.015	0.778	0.079
250	380		500	0.021	0.778	0.196
0	12	Air Compressors	15	0.364	1.715	2.259
15	24		25	0.383	1.208	2.222
25	37		50	0.599	2.664	2.291
50	78		120	0.285	1.817	1.930
120	147		175	0.213	1.562	1.547
175	218		250	0.160	0.554	1.329
250	385		500	0.154	0.530	1.177
500	595		750	0.155	0.530	1.207
750	808		1000	0.171	0.580	2.073
0	39	Bore/Drill Rigs	50	0.379	1.193	2.371
50	82		120	0.141	1.034	1.669
120	149		175	0.095	1.066	1.014
175	208		250	0.075	1.041	0.952
250	349		500	0.068	1.044	0.779
500	612		750	0.061	1.054	0.728
750	919		1000	0.068	1.055	1.528
1000	2667		9999	0.102	1.056	2.163
0	9	Cement and Mortar Mixers	15	0.370	1.943	2.320
15	25		25	0.412	1.354	2.503
0	18	Concrete/Industrial Saws	25	0.500	1.708	3.163
25	33		50	0.657	3.391	3.166
50	81		120	0.324	2.592	2.512
120	175		175	0.241	2.243	1.912
0	41	Cranes	50	0.617	0.826	1.715
50	89		120	0.242	0.749	2.005
120	148		175	0.171	0.756	1.714
175	217		250	0.129	0.754	1.465
250	336		500	0.105	0.753	1.238
500	567		750	0.076	0.750	0.988
750	938		1000	0.241	0.748	2.635
1000	1030		9999	0.052	0.752	0.677
0	43	Crawler Tractors	50	0.999	1.324	2.511
50	87		120	0.340	1.226	2.742
120	150		175	0.232	1.213	2.308
175	203		250	0.170	1.217	2.132
250	341		500	0.143	1.223	1.687
500	570		750	0.120	1.217	1.433
750	828		1000	0.206	1.224	3.093
1000	1527		9999	0.149	1.168	2.516
0	45	Crushing/Proc. Equipment	50	0.831	4.147	3.505
50	85		120	0.405	2.917	2.764
120	171		175	0.308	2.522	2.106
175	250		250	0.238	0.885	1.795
250	382		500	0.230	0.848	1.596
500	602		750	0.230	0.847	1.626
750	1337		9999	0.270	0.916	3.064
0	16	Dumpers/Tenders	25	0.261	0.889	1.650
0	36	Excavators	50	0.255	1.082	1.603
50	82		120	0.130	0.964	1.287

120	146		175	0.098	0.973	0.967
175	218		250	0.074	0.972	0.856
250	329		500	0.065	0.970	0.680
500	578		750	0.070	0.966	0.759
750	843		1000	0.061	0.965	1.335
1000	1569		9999	0.059	0.963	1.179
0	42	Forklifts	50	0.262	0.638	0.977
50	82		120	0.107	0.572	0.914
120	141		175	0.080	0.573	0.777
175	208		250	0.079	0.574	0.854
250	344		500	0.056	0.575	0.553
500	880		1000	0.015	0.573	0.465
0	11	Generator Sets	15	0.496	2.643	3.458
15	19		25	0.545	1.863	3.426
25	33		50	0.635	3.124	3.259
50	84		120	0.330	2.541	2.759
120	153		175	0.236	2.185	2.212
175	229		250	0.170	0.776	1.895
250	363		500	0.160	0.758	1.700
500	586		750	0.163	0.758	1.741
750	1130		9999	0.212	0.830	2.994
0	39	Graders	50	1.119	1.158	2.430
50	91		120	0.441	1.103	3.335
120	148		175	0.260	1.124	2.458
175	204		250	0.154	1.118	1.989
250	293		500	0.138	1.109	1.315
500	796		1000	0.303	1.109	3.798
1000	1993		9999	0.203	1.107	2.728
0	38	Off-Highway Tractors	50	0.478	1.303	2.065
50	75		120	0.216	1.176	1.926
120	158		175	0.134	1.174	1.397
175	214		250	0.109	1.169	1.269
250	334		500	0.078	1.165	0.792
500	574		750	0.094	1.171	0.948
750	1000		1000	0.064	1.172	1.035
1000	1726		9999	0.112	1.201	1.658
0	29	Off-Highway Trucks	50	0.395	0.656	1.883
50	87		120	0.208	0.596	1.654
120	159		175	0.129	0.602	1.079
175	211		250	0.123	0.602	1.140
250	372		500	0.105	0.608	1.019
500	656		750	0.131	0.606	1.268
750	897		1000	0.118	0.602	1.820
1000	1764		9999	0.114	0.612	1.567
0	38	Other Construction Equipment	50	0.501	1.336	2.161
50	82		120	0.239	1.193	2.097
120	152		175	0.179	1.189	1.842
175	217		250	0.129	1.202	1.594
250	357		500	0.102	1.201	1.186
500	598		750	0.090	1.199	1.138
750	830		1000	0.083	1.190	1.599
1000	1127		9999	0.095	1.163	1.640

0	35	Other General Industrial Equipmen	50	0.373	0.972	1.642
50	73		120	0.179	0.869	1.537
120	149		175	0.108	0.872	1.025
175	209		250	0.092	0.875	1.032
250	355		500	0.085	0.874	0.880
500	592		750	0.071	0.875	0.723
750	885		1000	0.094	0.872	1.652
1000	2000		9999	0.105	0.872	1.563
0	36	Other Material Handling Equipment	50	0.528	1.196	2.047
50	93		120	0.149	1.081	1.410
120	145		175	0.116	1.078	1.096
175	218		250	0.124	1.076	1.509
250	331		500	0.120	1.074	1.332
500	565		750	0.101	1.078	1.046
750	923		1000	0.033	1.078	0.924
1000	1050		9999	0.079	1.078	1.416
0	39	Pavers	50	0.616	1.428	2.042
50	80		120	0.216	1.274	1.940
120	158		175	0.130	1.282	1.348
175	213		250	0.081	1.283	1.292
250	327		500	0.072	1.265	0.943
500	750		750	0.050	1.280	0.498
0	35	Paving Equipment	50	0.262	1.293	1.505
50	89		120	0.158	1.178	1.435
120	148		175	0.094	1.170	0.956
175	216		250	0.089	1.174	1.154
250	339		500	0.085	1.165	1.057
500	605		750	0.082	1.174	1.202
750	842		1000	0.031	1.175	0.819
0	8	Plate Compactors	15	0.284	1.492	1.781
0	13	Pressure Washers	15	0.201	1.072	1.402
15	19		25	0.221	0.755	1.389
25	38		50	0.187	1.062	1.268
50	64		120	0.111	0.979	1.068
0	8	Pumps	15	0.561	2.643	3.483
15	21		25	0.591	1.863	3.426
25	37		50	0.693	3.294	3.304
50	84		120	0.349	2.583	2.801
120	151		175	0.251	2.221	2.247
175	217		250	0.183	0.789	1.926
250	372		500	0.172	0.768	1.723
500	615		750	0.175	0.768	1.765
750	1460		9999	0.222	0.842	3.031
0	36	Rollers	50	0.382	1.180	1.743
50	87		120	0.166	1.063	1.568
120	144		175	0.091	1.059	1.013
175	213		250	0.083	1.062	1.082
250	335		500	0.092	1.076	1.091
500	521		750	0.031	1.061	0.263
0	47	Rough Terrain Forklifts	50	0.425	1.273	1.832
50	96		120	0.085	1.145	1.054
120	130		175	0.063	1.142	0.827

175	208		250	0.046	1.145	0.659
250	374		500	0.049	1.131	0.788
500	625		750	0.041	1.143	0.534
0	42	Rubber Tired Dozers	50	0.503	1.072	1.769
50	82		120	0.398	0.980	2.991
120	150		175	0.314	0.969	2.973
175	211		250	0.269	0.972	2.739
250	354		500	0.237	0.983	2.428
500	584		750	0.188	0.969	2.420
0	42	Rubber Tired Loaders	50	0.607	0.988	1.965
50	86		120	0.225	0.877	1.811
120	150		175	0.153	0.888	1.396
175	206		250	0.117	0.885	1.355
250	320		500	0.116	0.879	1.189
500	600		750	0.111	0.869	1.092
750	837		1000	0.122	0.886	1.975
1000	1521		9999	0.080	0.884	1.480
0	36	Scrapers	50	1.703	1.260	3.294
50	84		120	0.363	1.165	3.300
120	166		175	0.258	1.154	2.539
175	225		250	0.253	1.130	2.813
250	381		500	0.173	1.139	2.005
500	565		750	0.140	1.138	1.655
750	950		1000	0.593	1.138	6.460
1000	1923		9999	0.287	1.163	3.702
0	6	Signal Boards	15	0.542	2.845	3.397
15	37		50	0.693	3.540	3.332
50	82		120	0.341	2.746	2.660
120	158		175	0.251	2.374	2.029
175	216		250	0.227	1.008	2.088
0	43	Skid Steer Loaders	50	0.172	1.378	1.382
50	71		120	0.077	1.233	0.979
120	153		175	0.065	1.223	0.774
175	201		250	0.038	1.203	0.478
250	277		500	0.027	1.201	0.220
500	530		750	0.065	1.233	0.897
750	1000		1000	0.107	1.233	1.579
0	36	Surfacing Equipment	50	0.203	0.849	1.333
50	89		120	0.112	0.752	1.153
120	151		175	0.113	0.745	1.278
175	216		250	0.068	0.756	1.025
250	362		500	0.046	0.748	0.573
500	615		750	0.045	0.745	0.657
750	814		1000	0.098	0.752	1.754
1000	1141		9999	0.058	0.737	1.173
0	36	Sweepers/Scrubbers	50	0.682	1.544	2.380
50	78		120	0.262	1.393	2.174
120	159		175	0.250	1.390	2.415
175	204		250	0.112	1.381	1.306
250	303		500	0.206	1.387	2.476
500	848		1000	0.110	1.387	1.912
0	38	Tractors/Loaders/Backhoes	50	0.355	0.987	1.699



50	83		120	0.142	0.909	1.361
120	144		175	0.104	0.894	1.026
175	204		250	0.094	0.900	1.160
250	320		500	0.079	0.896	0.864
500	575		750	0.101	0.896	1.150
750	871		1000	0.072	0.911	1.432
1000	2006		9999	0.076	0.904	1.359
0	40	Trenchers	50	0.502	1.634	2.404
50	82		120	0.332	1.471	2.862
120	144		175	0.242	1.449	2.492
175	218		250	0.213	1.467	2.536
250	359		500	0.134	1.461	1.572
500	619		750	0.041	1.468	0.355
750	860		1000	0.607	1.462	6.666
0	11	Welders	15	0.341	1.607	2.118
15	20		25	0.359	1.133	2.083
25	46		50	0.525	2.334	2.099
50	70		120	0.249	1.658	1.780
120	174		175	0.184	1.424	1.428
175	211		250	0.136	0.505	1.227
250	297		500	0.130	0.486	1.088
0	29	Water Trucks	50	0.395	0.656	1.883
50	87		120	0.208	0.596	1.654
120	159		175	0.129	0.602	1.079
175	211		250	0.123	0.602	1.140
250	372		500	0.105	0.608	1.019
500	656		750	0.131	0.606	1.268
750	897		1000	0.118	0.602	1.820
1000	1764		9999	0.114	0.612	1.567

011 HP categories)

g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
SOX	PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.001	0.047	85.116	5.11	24.19	33.31	0.06	2.17	3,924.79
0.001	0.047	67.164	11.00	28.72	48.39	0.06	3.46	4,971.40
0.001	0.069	68.185	36.76	89.69	91.68	0.12	9.07	8,896.20
0.001	0.082	82.234	34.70	114.68	219.72	0.20	17.25	17,269.09
0.002	0.078	254.079	75.42	300.87	941.64	0.95	29.52	96,549.88
0.004	0.251	273.029	6.98	23.85	40.18	0.05	3.02	3,276.35
0.003	0.201	273.029	15.90	40.36	65.27	0.08	4.83	6,552.70
0.004	0.341	273.029	55.96	129.43	109.92	0.13	12.60	10,102.08
0.003	0.331	273.029	49.53	153.06	291.34	0.25	25.79	21,296.26
0.003	0.182	273.029	61.41	231.84	492.77	0.45	26.74	40,135.27
0.003	0.107	273.029	61.12	171.06	685.93	0.67	23.27	59,520.34
0.003	0.097	273.029	95.93	358.47	1,084.27	1.03	37.37	#####
0.003	0.098	273.029	151.34	553.99	1,720.07	1.63	58.54	#####
0.003	0.108	273.029	255.24	949.72	2,859.40	2.22	87.48	#####
0.002	0.054	119.487	5.52	28.65	34.80	0.07	2.12	4,692.69
0.001	0.044	88.089	9.52	30.57	60.92	0.09	3.62	7,252.34
0.001	0.077	94.779	36.99	124.17	131.50	0.18	11.50	14,078.07
0.002	0.131	168.382	46.42	223.90	343.33	0.41	27.14	34,981.85
0.002	0.076	183.260	54.76	342.09	521.05	0.72	26.59	63,991.19
0.002	0.030	139.423	47.92	158.85	663.35	0.96	18.58	85,321.62
0.002	0.032	153.653	71.09	255.43	918.30	1.39	29.03	#####
0.001	0.022	104.626	145.39	504.68	1,901.25	2.81	58.80	#####
0.005	0.187	318.534	3.93	17.88	25.47	0.04	1.68	2,866.81
0.004	0.226	318.534	18.20	47.03	78.10	0.10	5.66	7,963.35
0.005	0.200	415.232	9.36	30.88	60.96	0.09	3.60	7,474.17
0.005	0.460	415.232	64.30	154.70	144.14	0.18	15.18	13,702.64
0.005	0.444	415.232	70.12	230.76	436.81	0.39	35.96	33,633.78
0.005	0.245	415.232	99.51	402.59	841.96	0.82	42.86	72,665.55
0.003	0.357	258.865	66.54	152.39	119.01	0.14	14.50	10,517.30
0.003	0.339	255.738	57.26	172.69	329.94	0.27	30.15	22,746.73
0.003	0.181	246.433	61.09	223.87	472.68	0.41	26.75	36,443.68
0.003	0.112	234.444	63.08	175.67	629.09	0.57	24.22	50,874.43
0.002	0.104	243.055	91.14	351.11	900.93	0.80	34.90	81,692.55
0.002	0.105	242.350	154.69	590.79	1,552.20	1.38	59.43	#####
0.000	0.000	0.000						
0.004	0.183	427.436	548.93	2,183.11	5,938.91	4.43	188.02	#####
0.003	0.376	265.472	74.22	168.54	129.52	0.15	15.99	11,285.20
0.004	0.472	343.682	79.15	233.49	454.33	0.35	40.96	29,851.17
0.004	0.285	367.587	97.46	350.74	747.49	0.62	42.59	54,969.87
0.004	0.196	371.494	102.50	287.66	981.93	0.85	39.81	75,356.01
0.003	0.162	345.134	143.75	634.71	1,373.25	1.15	55.27	#####
0.004	0.176	369.712	259.30	1,137.76	2,513.70	2.12	100.11	#####
0.000	0.000	0.000						

0.002	0.092	195.553	399.55	1,796.35	4,185.68	3.00	140.15	#####
0.006	0.568	443.672	114.25	264.28	218.61	0.26	25.54	19,965.24
0.005	0.550	443.672	88.75	274.32	517.44	0.44	46.79	37,712.13
0.005	0.303	443.672	117.86	443.97	932.68	0.85	51.81	75,867.90
0.005	0.174	443.672	114.61	317.18	1,278.79	1.25	43.45	#####
0.004	0.158	443.672	155.94	569.83	1,739.30	1.66	60.49	#####
0.004	0.160	443.672	249.64	870.66	2,829.83	2.69	96.09	#####
0.004	0.177	443.672	693.68	2,524.38	7,746.73	5.96	237.02	#####
0.003	0.122	216.148	5.48	16.13	30.91	0.04	1.95	3,458.37
0.003	0.097	208.660	9.12	30.70	58.57	0.09	3.48	7,457.11
0.002	0.177	138.765	62.75	154.00	123.69	0.15	14.50	11,347.77
0.003	0.281	228.669	74.93	246.72	437.09	0.39	41.02	33,394.86
0.003	0.156	232.995	76.07	305.55	586.38	0.57	34.01	50,902.86
0.002	0.082	219.014	73.47	198.14	783.58	0.81	27.01	71,977.30
0.002	0.063	183.446	98.62	321.08	1,005.18	1.04	36.36	#####
0.000	0.000	0.000						
0.001	0.039	111.990	164.98	532.19	1,720.78	1.77	61.34	#####
0.002	0.203	156.923	37.67	90.69	72.36	0.09	8.63	6,655.08
0.002	0.219	171.952	32.43	104.21	182.42	0.17	18.03	14,163.39
0.002	0.124	179.962	38.74	150.63	291.38	0.29	17.51	25,425.83
0.002	0.055	168.058	32.03	81.82	373.48	0.39	11.37	34,981.84
0.000	0.000	0.000						
0.001	0.017	57.204	41.92	115.41	464.26	0.49	15.19	50,339.75
0.007	0.314	420.920	8.45	33.71	55.34	0.07	3.46	4,630.12
0.005	0.278	420.920	14.83	49.25	79.66	0.10	5.28	7,997.48
0.005	0.417	420.920	54.87	135.23	142.17	0.18	13.75	13,890.35
0.005	0.409	420.920	69.48	232.16	444.77	0.41	34.32	35,357.27
0.005	0.225	420.920	82.41	340.46	726.16	0.72	34.41	64,400.73
0.005	0.135	420.920	82.27	251.32	1,020.94	1.08	30.94	96,390.63
0.004	0.126	420.920	116.68	459.79	1,477.78	1.50	45.58	#####
0.004	0.127	420.920	194.60	742.25	2,448.40	2.48	74.60	#####
0.004	0.156	420.920	502.75	1,817.97	5,790.08	4.78	175.90	#####
0.004	0.420	318.965	73.65	173.01	138.38	0.16	16.44	12,491.08
0.004	0.473	373.677	80.86	253.38	472.00	0.40	43.06	34,003.51
0.004	0.266	379.933	88.88	339.58	694.52	0.63	39.28	56,209.86
0.004	0.167	382.031	89.09	248.14	917.59	0.88	34.03	78,069.25
0.003	0.140	355.058	106.92	399.24	1,083.76	1.02	40.94	#####
0.000	0.000	0.000						
0.001	0.044	110.562	228.69	845.06	2,354.94	2.22	87.82	#####
0.013	1.634	1128.991	122.67	345.82	701.60	0.50	61.53	42,518.59
0.009	0.667	793.735	114.91	396.32	877.00	0.67	49.69	59,156.28
0.004	0.232	374.226	92.92	264.61	846.39	0.67	36.72	59,156.28
0.012	0.663	1205.093	363.31	1,850.10	3,395.73	2.59	141.76	#####
0.000	0.000	0.000						
0.000	0.000	0.000						
0.000	0.000	0.000						
0.002	0.115	213.965	554.37	2,866.00	5,534.44	3.71	198.10	#####
0.022	1.352	1947.090	89.17	347.89	671.00	0.64	39.40	56,738.90
0.010	0.343	867.696	82.63	217.38	845.07	0.85	29.89	75,543.78
0.008	0.281	777.453	123.63	395.61	1,206.27	1.21	44.59	#####
0.010	0.349	949.549	202.07	641.69	2,018.46	2.01	73.56	#####
0.000	0.000	0.000						

0.000	0.000	0.000						
0.000	0.000	0.000						
0.002	0.063	160.623	322.42	1,092.35	3,620.83	2.85	110.94	#####
0.002	0.055	120.626	5.39	27.99	34.00	0.07	2.07	4,584.61
0.001	0.037	73.505	7.87	25.27	50.36	0.08	2.99	5,995.26
0.001	0.090	83.257	56.46	142.65	130.83	0.16	13.74	12,695.85
0.002	0.176	169.093	71.34	251.23	448.47	0.43	38.25	36,676.91
0.002	0.077	135.388	61.63	269.09	519.86	0.54	27.53	48,314.76
0.000	0.000	0.000						
0.000	0.000	0.000						
0.001	0.031	102.356	88.12	319.94	1,032.70	1.13	34.89	#####
0.001	0.034	82.643	3.01	17.71	21.15	0.05	1.18	2,900.93
0.001	0.045	95.123	8.52	28.67	54.73	0.09	3.26	6,962.24
0.001	0.092	66.128	62.85	143.24	111.27	0.13	13.74	9,863.18
0.002	0.182	134.599	71.46	212.97	401.57	0.33	38.14	28,139.05
0.001	0.091	122.674	73.13	264.53	557.33	0.49	32.30	43,514.01
0.001	0.043	103.965	68.72	183.32	738.56	0.69	25.60	61,499.80
0.001	0.051	136.032	120.96	422.27	1,278.93	1.18	45.57	#####
0.001	0.038	99.212	201.52	695.98	2,167.63	2.00	76.28	#####
0.005	0.531	384.920	86.63	197.48	154.63	0.18	18.97	13,759.53
0.003	0.396	295.388	69.29	207.17	391.18	0.32	36.91	27,519.05
0.004	0.282	383.028	92.20	334.84	706.59	0.62	40.71	55,373.70
0.003	0.125	301.336	72.80	195.35	787.02	0.74	27.21	65,777.25
0.003	0.099	262.307	86.27	304.16	921.15	0.85	32.72	86,919.92
0.000	0.000	0.000						
0.000	0.000	0.000						
0.003	0.133	320.257	407.34	1,489.12	4,492.68	3.30	139.45	#####
0.003	0.132	219.130	14.89	42.14	77.37	0.11	5.09	8,463.90
0.002	0.220	159.529	81.46	183.21	144.67	0.16	17.51	12,695.85
0.002	0.265	198.483	82.71	242.90	483.12	0.37	41.92	31,386.95
0.003	0.208	272.918	102.23	368.16	801.76	0.65	44.35	58,189.33
0.003	0.147	269.306	121.91	351.27	1,167.73	0.99	48.23	88,165.62
0.001	0.068	141.065	130.34	621.52	1,266.78	1.04	51.27	#####
0.002	0.082	164.512	7.52	24.14	48.11	0.07	2.86	5,727.92
0.002	0.168	122.494	69.13	155.28	123.44	0.14	14.87	10,852.91
0.002	0.221	166.573	64.66	189.97	378.58	0.29	32.74	24,720.50
0.002	0.160	212.473	79.73	287.27	628.57	0.52	34.49	45,823.38
0.000	0.000	0.000						
0.000	0.000	0.000						
0.001	0.036	65.879	75.95	219.48	731.23	0.62	30.07	55,470.42
0.004	0.118	244.588	2.34	11.95	14.90	0.03	0.94	1,956.71
0.003	0.127	170.643	4.05	16.15	26.52	0.03	1.66	2,218.36
0.002	0.113	170.643	6.01	19.97	32.30	0.04	2.14	3,242.22
0.002	0.148	170.643	20.70	53.70	64.42	0.08	5.63	6,484.44
0.002	0.146	170.643	19.55	68.46	131.42	0.13	9.36	10,921.16
0.007	0.388	420.920	7.17	24.51	41.30	0.05	3.10	3,367.36
0.005	0.310	420.920	21.45	54.44	88.05	0.11	6.52	8,839.31
0.005	0.434	420.920	65.49	159.24	160.98	0.20	16.05	15,574.04
0.005	0.425	420.920	71.56	235.70	451.26	0.41	35.68	35,357.26
0.005	0.234	420.920	83.90	341.09	727.20	0.72	35.32	63,558.92
0.005	0.141	420.920	80.69	242.68	981.71	1.03	30.50	91,339.56
0.004	0.130	420.920	123.47	491.15	1,531.44	1.54	48.32	#####

0.004	0.132	420.920	210.45	811.97	2,598.36	2.60	80.97	#####
0.004	0.158	420.920	660.30	2,434.06	7,559.91	6.18	230.61	#####
0.001	0.036	80.351	3.37	17.50	21.26	0.04	1.30	2,866.80
0.001	0.035	69.676	7.95	25.51	50.83	0.08	3.02	6,052.14
0.001	0.102	81.971	65.19	151.78	128.72	0.15	14.63	11,785.76
0.001	0.150	125.472	61.85	193.70	371.96	0.31	31.92	26,756.84
0.002	0.097	146.485	75.04	287.72	609.40	0.55	32.53	49,054.22
0.002	0.060	133.411	79.28	230.01	823.33	0.78	30.98	69,440.41
0.004	0.409	324.798	85.05	203.21	166.81	0.20	19.36	15,357.89
0.003	0.357	294.068	63.78	206.12	376.19	0.33	34.40	28,326.76
0.005	0.291	437.172	84.47	333.56	667.46	0.64	37.65	56,653.53
0.004	0.144	371.911	79.13	219.92	862.34	0.87	29.95	77,471.99
0.000	0.000	0.000						
0.002	0.066	186.206	106.82	370.72	1,140.58	1.14	41.00	#####
0.016	1.223	1412.268	118.12	401.95	887.24	0.66	50.84	58,729.69
0.011	0.654	1020.078	136.26	382.67	1,214.43	0.94	53.32	83,228.33
0.008	0.452	802.659	176.28	897.35	1,587.25	1.18	67.62	#####
0.009	0.486	857.370	266.42	1,351.04	2,428.90	1.82	102.60	#####
0.000	0.000	0.000						
0.005	0.255	459.645	415.55	2,159.24	4,093.32	2.70	148.87	#####
0.002	0.089	184.165	9.62	31.73	62.63	0.10	3.70	7,678.94
0.002	0.214	164.013	82.27	193.59	155.90	0.18	18.41	14,129.25
0.002	0.223	178.155	62.87	197.98	368.17	0.31	33.51	26,722.73
0.003	0.162	234.204	75.37	289.53	591.37	0.54	33.31	48,223.76
0.002	0.091	211.376	75.85	211.84	787.78	0.76	28.97	67,574.69
0.002	0.069	179.033	108.48	401.85	1,109.91	1.06	41.62	#####
0.003	0.103	263.180	224.81	823.23	2,335.12	2.21	86.43	#####
0.002	0.071	177.105	312.54	1,178.97	3,495.38	2.71	107.28	#####
0.014	1.620	1178.450	113.60	333.49	653.12	0.50	58.53	42,592.56
0.009	0.619	796.487	119.68	429.16	920.93	0.76	52.23	67,165.15
0.006	0.307	571.806	130.86	369.19	1,249.65	1.07	51.04	95,014.11
0.006	0.309	648.067	180.16	809.55	1,721.84	1.43	69.59	#####
0.000	0.000	0.000						
0.000	0.000	0.000						
0.000	0.000	0.000						
0.001	0.063	130.956	313.31	1,398.53	3,035.29	2.53	121.40	#####
0.007	0.189	466.425	3.26	17.09	20.40	0.04	1.14	2,798.55
0.006	0.485	443.672	75.34	180.84	171.91	0.21	17.94	16,415.87
0.005	0.473	443.672	76.20	248.22	471.23	0.43	38.77	36,381.13
0.005	0.261	443.672	96.16	385.40	812.67	0.79	41.20	70,100.20
0.006	0.188	536.104	106.31	312.55	1,260.78	1.30	40.56	#####
0.002	0.097	143.940	13.21	35.05	59.91	0.08	4.21	6,256.92
0.002	0.167	164.106	45.79	123.64	115.79	0.15	11.78	11,575.30
0.000	0.000	0.000						
0.000	0.000	0.000						
0.000	0.000	0.000						
0.000	0.000	0.000						
0.000	0.019	19.396	34.36	130.96	220.07	0.23	19.13	19,396.44
0.002	0.200	179.414	30.31	72.64	67.79	0.08	7.12	6,399.12
0.004	0.351	326.162	61.83	201.20	387.39	0.34	31.14	28,924.03
0.003	0.155	257.700	54.78	220.00	464.77	0.44	23.41	38,906.63
0.003	0.116	283.137	64.52	195.21	698.34	0.69	25.13	61,175.57

0.003	0.103	276.905	94.66	410.73	1,039.06	0.98	37.37	#####
0.000	0.000	0.000						
0.000	0.000	0.000						
0.001	0.052	137.965	151.62	644.39	1,667.46	1.58	59.26	#####
0.002	0.062	152.169	5.62	33.06	39.47	0.08	2.20	5,415.07
0.001	0.055	114.751	11.10	36.76	72.69	0.11	4.29	8,896.19
0.001	0.115	89.742	81.04	190.39	155.36	0.19	18.30	14,311.27
0.002	0.209	166.517	78.40	246.98	446.69	0.40	42.71	34,037.63
0.002	0.142	208.420	95.77	367.00	740.00	0.71	42.92	63,046.95
0.001	0.029	86.663	67.26	177.36	799.78	0.83	24.54	73,490.33
0.002	0.102	187.845	10.74	32.44	63.35	0.09	3.92	7,195.45
0.002	0.199	166.547	69.83	173.91	146.18	0.18	16.46	13,765.22
0.002	0.188	163.015	49.23	168.03	295.45	0.28	27.03	23,463.43
0.003	0.141	225.193	63.91	267.81	509.22	0.52	28.83	45,988.34
0.003	0.085	243.327	72.50	201.76	814.47	0.88	27.10	77,898.63
0.003	0.087	272.220	131.39	434.32	1,423.74	1.76	49.93	#####
0.000	0.000	0.000						
0.001	0.038	116.988	199.97	651.47	2,208.12	2.64	76.27	#####
0.002	0.039	96.524	4.47	23.44	27.99	0.06	1.56	3,839.47
0.002	0.088	181.964	18.70	61.69	121.78	0.19	7.20	14,931.28
0.001	0.138	103.783	91.54	206.49	168.36	0.19	19.84	14,931.28
0.002	0.174	134.767	76.11	225.04	451.41	0.35	38.00	29,435.96
0.002	0.135	182.058	112.54	409.13	896.45	0.73	48.46	65,271.00
0.002	0.090	163.272	139.25	407.38	1,337.22	1.14	55.49	#####
0.002	0.080	164.194	172.87	864.17	1,696.80	1.39	68.51	#####
0.004	0.236	255.965	6.00	20.50	34.53	0.04	2.59	2,815.61
0.003	0.189	255.965	12.42	31.53	50.99	0.06	3.78	5,119.30
0.003	0.299	255.965	59.43	139.55	125.71	0.15	13.74	11,774.38
0.003	0.291	255.965	39.67	125.31	239.14	0.21	20.35	17,917.54
0.003	0.160	255.965	64.67	250.51	533.27	0.50	27.85	44,537.86
0.003	0.095	255.965	52.75	151.36	607.33	0.61	20.11	54,008.55
0.003	0.087	255.965	65.98	255.18	769.65	0.75	25.82	76,021.54
0.022	1.352	1947.090	89.167	347.888	670.995	0.638	39.396	56738.898
0.010	0.343	867.696	82.633	217.377	845.066	0.850	29.888	75543.783
0.008	0.281	777.453	123.626	395.605	1206.274	1.212	44.595	123528.665
0.010	0.349	949.549	202.067	641.690	2018.460	2.015	73.560	200369.253
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.002	0.063	160.623	322.418	1092.350	3620.834	2.849	110.941	283370.036

g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
SOX	PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.002	0.013	179.282	2.56	39.91	43.76	0.08	0.59	8,267
0.002	0.015	161.199	2.82	57.61	45.09	0.11	1.11	11,932

0.002	0.010	161.168	3.97	101.52	39.49	0.20	1.28	21,028
0.002	0.003	161.179	3.23	163.42	16.66	0.32	0.56	33,848
0.002	0.003	161.179	8.03	295.70	74.47	0.58	1.04	61,248
0.004	0.121	272.784	4.37	20.57	27.11	0.05	1.45	3,273
0.003	0.110	272.784	9.20	29.00	53.33	0.08	2.65	6,547
0.004	0.156	272.784	22.16	98.56	84.75	0.13	5.78	10,093
0.003	0.141	272.784	22.21	141.76	150.54	0.25	11.02	21,277
0.003	0.081	272.784	31.28	229.59	227.35	0.45	11.96	40,099
0.003	0.042	272.784	34.91	120.67	289.73	0.67	9.21	59,467
0.003	0.040	272.784	59.41	203.87	453.21	1.03	15.59	105,022
0.003	0.041	272.784	92.20	315.07	718.28	1.63	24.40	162,306
0.003	0.055	272.784	138.19	468.50	1,675.18	2.22	44.15	220,409
0.003	0.152	296.964	14.90	46.86	93.11	0.11	5.97	11,663
0.002	0.091	257.296	11.57	85.10	137.39	0.20	7.45	21,183
0.003	0.044	265.411	14.16	158.38	150.60	0.38	6.54	39,423
0.002	0.027	259.113	15.66	216.27	197.76	0.51	5.61	53,832
0.002	0.024	259.797	23.72	364.45	272.14	0.87	8.40	90,717
0.003	0.024	262.406	37.49	645.13	445.48	1.53	14.71	160,582
0.003	0.031	262.691	62.52	969.87	1,404.51	2.31	28.10	241,413
0.003	0.054	262.792	270.84	2,815.34	5,767.64	6.69	144.66	700,778
0.005	0.091	318.248	3.33	17.49	20.88	0.04	0.82	2,864
0.004	0.110	318.248	10.30	33.85	62.57	0.10	2.75	7,956
0.005	0.118	414.859	9.01	30.75	56.93	0.09	2.13	7,467
0.005	0.177	414.859	21.69	111.91	104.49	0.18	5.85	13,690
0.005	0.161	414.859	26.25	209.96	203.48	0.39	13.06	33,604
0.005	0.094	414.859	42.21	392.51	334.53	0.82	16.47	72,600
0.002	0.177	165.317	25.06	33.54	69.67	0.06	7.20	6,717
0.001	0.144	149.974	21.54	66.61	178.30	0.13	12.83	13,340
0.001	0.092	151.491	25.31	111.87	253.44	0.21	13.54	22,403
0.001	0.062	150.954	27.91	163.58	317.85	0.31	13.47	32,757
0.001	0.050	150.854	35.38	253.19	416.04	0.48	16.76	50,703
0.001	0.036	150.222	43.10	425.48	560.17	0.81	20.23	85,205
0.001	0.127	149.752	225.86	701.15	2,470.72	1.34	118.82	140,408
0.001	0.017	150.667	53.52	774.95	696.91	1.48	17.64	155,187
0.002	0.275	244.433	42.46	56.30	106.72	0.10	11.67	10,391
0.002	0.229	226.315	29.52	106.51	238.12	0.19	19.91	19,657
0.002	0.128	223.820	34.69	181.36	345.11	0.32	19.21	33,471
0.002	0.080	224.669	34.56	246.94	432.47	0.44	16.31	45,573
0.002	0.066	225.792	48.73	416.82	574.73	0.73	22.33	76,926
0.002	0.053	224.641	68.13	693.95	817.13	1.22	30.07	128,071
0.002	0.090	225.973	170.91	1,014.04	2,561.16	1.79	74.80	187,143
0.002	0.066	215.490	227.30	1,782.39	3,840.82	3.14	100.46	328,945
0.006	0.210	443.274	37.40	186.59	157.74	0.26	9.45	19,947
0.005	0.188	443.274	34.44	247.92	234.95	0.44	16.01	37,678
0.005	0.110	443.274	52.62	431.30	360.17	0.85	18.90	75,800
0.005	0.058	443.274	59.44	221.24	448.65	1.25	14.44	110,818
0.004	0.056	443.274	88.02	323.87	609.54	1.66	21.21	169,331
0.004	0.056	443.274	138.29	509.85	979.08	2.68	33.43	266,851
0.004	0.076	443.274	360.40	1,224.33	4,096.03	5.96	102.24	592,657
0.003	0.064	215.954	4.17	14.23	26.40	0.04	1.02	3,455
0.002	0.096	222.224	9.10	38.67	57.30	0.08	3.42	7,942
0.002	0.080	197.942	10.62	78.81	105.21	0.15	6.58	16,187

0.002	0.047	199.779	14.37	142.04	141.25	0.28	6.81	29,176
0.002	0.026	199.600	16.21	212.30	187.05	0.42	5.67	43,607
0.002	0.022	199.180	21.29	318.69	223.39	0.63	7.25	65,459
0.002	0.026	198.374	40.70	558.17	438.47	1.09	14.81	114,648
0.002	0.025	198.218	51.46	813.40	1,124.88	1.60	20.81	167,073
0.002	0.022	197.811	92.04	1,511.16	1,849.25	2.96	34.64	310,393
0.001	0.081	117.014	11.10	27.04	41.44	0.05	3.42	4,963
0.001	0.071	105.000	8.83	47.13	75.32	0.08	5.84	8,649
0.001	0.042	105.128	11.36	80.94	109.75	0.14	5.97	14,853
0.001	0.035	105.400	16.39	119.55	177.81	0.21	7.34	21,939
0.001	0.023	105.464	19.34	197.53	190.09	0.35	7.73	36,250
0.001	0.004	105.117	13.27	504.07	409.61	0.88	3.43	92,503
0.007	0.173	420.542	5.46	29.08	38.04	0.07	1.90	4,626
0.005	0.164	420.542	10.36	35.39	65.09	0.10	3.12	7,990
0.005	0.186	420.542	20.95	103.11	107.56	0.18	6.13	13,878
0.005	0.172	420.542	27.71	213.42	231.75	0.41	14.49	35,326
0.005	0.098	420.542	36.09	334.31	338.40	0.72	15.04	64,343
0.005	0.054	420.542	38.97	177.61	433.85	1.08	12.26	96,304
0.004	0.052	420.542	58.12	275.19	617.11	1.50	18.70	152,657
0.004	0.052	420.542	95.38	444.25	1,020.52	2.48	30.54	246,438
0.004	0.071	420.542	239.05	938.03	3,383.08	4.78	80.76	475,212
0.002	0.301	223.130	43.83	45.34	95.15	0.08	11.79	8,738
0.002	0.272	212.566	40.17	100.37	303.44	0.18	24.74	19,343
0.002	0.138	216.615	38.53	166.29	363.61	0.31	20.35	32,048
0.002	0.064	215.413	31.46	228.42	406.38	0.42	13.04	44,020
0.002	0.051	213.756	40.47	325.18	385.57	0.60	14.91	62,667
0.002	0.132	213.737	241.58	882.83	3,023.02	1.62	105.21	170,135
0.002	0.084	213.348	404.33	2,206.16	5,435.79	4.06	167.97	425,161
0.002	0.159	253.346	17.98	49.08	77.77	0.09	5.97	9,541
0.002	0.144	228.567	16.07	87.63	143.51	0.16	10.75	17,035
0.002	0.069	228.171	21.19	185.54	220.82	0.34	10.92	36,068
0.002	0.043	227.154	23.24	249.88	271.39	0.46	9.09	48,575
0.002	0.027	226.509	26.12	389.69	264.98	0.72	9.11	75,753
0.002	0.036	227.642	53.65	671.63	543.71	1.25	20.47	130,560
0.002	0.027	227.753	63.64	1,171.61	1,035.43	2.17	26.84	227,753
0.002	0.043	233.512	192.77	2,073.63	2,861.55	3.85	74.74	403,100
0.002	0.146	216.755	11.51	19.12	54.88	0.06	4.24	6,316
0.002	0.121	196.739	18.14	51.86	143.96	0.16	10.54	17,129
0.002	0.057	198.818	20.48	95.64	171.40	0.30	9.07	31,590
0.002	0.045	198.739	25.89	126.97	240.54	0.40	9.59	41,937
0.002	0.037	200.897	39.22	226.52	379.53	0.71	13.80	74,817
0.002	0.049	200.000	85.70	397.18	831.75	1.25	32.22	131,184
0.002	0.047	198.812	105.86	540.07	1,632.72	1.70	42.54	178,380
0.002	0.040	202.045	201.07	1,079.19	2,764.10	3.40	70.94	356,445
0.002	0.182	242.988	19.03	50.77	82.15	0.09	6.91	9,235
0.002	0.157	217.094	19.52	97.34	171.04	0.17	12.84	17,707
0.002	0.097	216.299	27.32	181.33	280.81	0.31	14.79	32,983
0.002	0.059	218.640	28.00	260.71	345.74	0.45	12.82	47,424
0.002	0.043	218.532	36.23	428.73	423.30	0.74	15.21	77,986
0.002	0.038	218.133	53.88	716.72	680.17	1.24	22.47	130,372
0.002	0.038	216.522	69.17	988.16	1,327.07	1.72	31.93	179,747
0.002	0.039	211.532	106.72	1,310.21	1,848.19	2.28	44.21	238,326



0.002	0.128	199.186	13.08	34.13	57.65	0.07	4.48	6,992
0.002	0.117	177.921	13.08	63.57	112.46	0.12	8.58	13,022
0.002	0.053	178.621	16.09	130.06	152.84	0.25	7.97	26,642
0.002	0.036	179.141	19.33	182.83	215.73	0.36	7.56	37,451
0.002	0.032	179.029	30.26	310.02	312.14	0.61	11.19	63,504
0.002	0.026	179.232	42.09	517.60	427.54	1.01	15.32	106,023
0.002	0.040	178.698	83.56	772.06	1,461.72	1.51	35.46	158,148
0.002	0.045	178.698	209.99	1,744.77	3,125.44	3.41	89.25	357,397
0.002	0.179	229.351	18.86	42.74	73.18	0.08	6.39	8,198
0.002	0.091	207.401	13.88	100.73	131.32	0.18	8.50	19,322
0.002	0.055	206.802	16.72	155.86	158.51	0.29	7.93	29,897
0.002	0.049	206.479	27.10	234.96	329.38	0.43	10.62	45,071
0.002	0.050	205.960	39.89	355.79	441.54	0.65	16.73	68,248
0.002	0.042	206.729	56.96	608.45	590.35	1.11	23.47	116,716
0.002	0.008	206.729	30.43	994.72	853.07	1.82	7.32	190,811
0.002	0.030	206.729	82.50	1,131.59	1,487.08	2.07	31.65	217,066
0.002	0.181	242.353	23.80	55.15	78.88	0.09	7.00	9,361
0.002	0.144	216.208	17.15	101.37	154.40	0.16	11.42	17,207
0.002	0.066	217.623	20.54	202.74	213.14	0.33	10.44	34,414
0.002	0.035	217.705	17.31	273.46	275.52	0.44	7.46	46,417
0.002	0.034	214.732	23.70	414.15	308.70	0.67	11.02	70,299
0.002	0.022	217.241	37.15	959.87	373.61	1.56	16.29	162,931
0.002	0.096	204.685	9.12	45.03	52.39	0.07	3.33	7,127
0.002	0.100	186.415	14.00	104.36	127.15	0.16	8.84	16,516
0.002	0.047	185.198	14.01	173.66	141.89	0.26	7.04	27,485
0.002	0.040	185.744	19.30	253.12	248.98	0.38	8.55	40,059
0.002	0.038	184.385	28.67	394.67	358.21	0.60	12.81	62,462
0.002	0.030	185.781	49.52	710.20	727.42	1.07	17.86	112,398
0.002	0.013	185.931	26.24	989.20	689.33	1.50	10.97	156,554
0.004	0.070	244.369	2.28	11.94	14.25	0.03	0.56	1,955
0.003	0.070	170.490	2.61	13.93	18.23	0.03	0.91	2,216
0.002	0.067	170.490	4.20	14.35	26.39	0.04	1.26	3,239
0.002	0.063	170.490	7.12	40.35	48.17	0.08	2.38	6,479
0.002	0.059	170.490	7.09	62.63	68.33	0.13	3.78	10,911
0.007	0.186	420.542	4.49	21.15	27.86	0.05	1.49	3,364
0.005	0.170	420.542	12.41	39.12	71.94	0.11	3.57	8,831
0.005	0.196	420.542	25.65	121.89	122.24	0.20	7.26	15,560
0.005	0.182	420.542	29.31	217.01	235.29	0.41	15.25	35,326
0.005	0.104	420.542	37.95	335.36	339.28	0.71	15.63	63,502
0.005	0.056	420.542	39.60	171.20	418.00	1.03	12.12	91,258
0.004	0.054	420.542	64.11	285.74	640.94	1.54	19.94	156,442
0.004	0.054	420.542	107.43	472.39	1,085.69	2.60	33.36	258,633
0.004	0.073	420.542	324.09	1,229.20	4,424.59	6.17	107.27	613,991
0.002	0.131	218.583	13.62	42.11	62.18	0.07	4.68	7,799
0.002	0.103	196.946	14.41	92.36	136.21	0.16	8.96	17,107
0.002	0.046	196.181	13.03	152.29	145.62	0.27	6.69	28,207
0.002	0.034	196.719	17.62	226.49	230.69	0.40	7.34	41,950
0.002	0.042	199.240	30.79	360.22	365.43	0.64	13.94	66,721
0.002	0.003	196.512	16.31	552.23	136.88	0.98	1.81	102,285
0.002	0.132	234.101	20.07	60.20	86.63	0.11	6.23	11,069
0.002	0.047	210.567	8.18	110.31	101.54	0.19	4.52	20,283
0.002	0.030	210.048	8.14	148.03	107.19	0.26	3.92	27,220

0.002	0.015	210.470	9.58	238.43	137.25	0.42	3.05	43,843
0.002	0.017	207.928	18.28	422.79	294.76	0.74	6.45	77,742
0.002	0.004	210.233	25.89	714.57	333.73	1.25	2.33	131,396
0.002	0.147	229.177	20.91	44.58	73.55	0.09	6.13	9,530
0.002	0.257	209.538	32.44	79.97	244.06	0.16	20.96	17,096
0.002	0.171	207.164	46.99	145.05	444.98	0.30	25.60	31,009
0.002	0.134	207.855	56.83	205.13	577.90	0.42	28.18	43,853
0.002	0.112	210.088	83.80	347.93	859.80	0.71	39.58	74,382
0.002	0.086	207.172	109.88	566.04	1,413.65	1.16	50.36	121,009
0.002	0.187	210.259	25.29	41.21	81.94	0.08	7.81	8,767
0.002	0.145	186.590	19.40	75.57	156.03	0.15	12.53	16,074
0.002	0.077	188.893	23.01	133.20	209.43	0.27	11.58	28,333
0.002	0.045	188.251	24.12	182.22	278.95	0.37	9.35	38,762
0.002	0.044	187.052	37.01	281.12	380.25	0.57	14.19	59,799
0.002	0.043	184.757	66.67	521.55	655.83	1.06	25.73	110,942
0.002	0.053	188.417	102.48	741.22	1,652.84	1.51	44.26	157,670
0.002	0.032	187.942	121.27	1,343.85	2,251.56	2.73	49.01	285,860
0.003	0.453	279.274	61.54	45.54	119.07	0.10	16.36	10,094
0.002	0.253	258.321	30.57	98.28	278.30	0.21	21.38	21,783
0.002	0.137	255.788	42.79	191.76	421.92	0.41	22.71	42,503
0.002	0.124	250.443	56.94	254.20	632.82	0.54	27.86	56,343
0.002	0.079	252.378	66.01	434.22	764.63	0.92	29.96	96,244
0.002	0.059	252.307	78.95	643.10	935.06	1.36	33.57	142,541
0.002	0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.002	0.145	257.796	551.58	2,236.99	7,120.10	4.73	278.53	495,821
0.007	0.133	466.006	3.25	17.07	20.38	0.04	0.80	2,796
0.006	0.184	443.274	25.63	130.98	123.29	0.21	6.82	16,401
0.005	0.169	443.274	27.97	225.13	218.11	0.43	13.85	36,348
0.005	0.098	443.274	39.66	375.01	320.56	0.79	15.41	70,037
0.006	0.063	535.623	49.03	217.76	450.92	1.30	13.58	115,695
0.002	0.057	215.367	7.48	59.90	60.07	0.09	2.46	9,362
0.002	0.045	192.650	5.42	86.94	69.03	0.13	3.16	13,589
0.002	0.034	191.090	9.98	186.97	118.41	0.28	5.17	29,223
0.002	0.014	188.095	7.72	241.34	95.89	0.36	2.88	37,719
0.002	0.003	187.666	7.36	332.20	60.98	0.50	0.90	51,921
0.002	0.038	192.714	34.28	653.51	475.40	0.98	20.39	102,138
0.002	0.051	192.714	106.82	1,233.03	1,579.42	1.84	51.44	192,714
0.002	0.075	178.751	7.24	30.29	47.53	0.06	2.69	6,375
0.002	0.068	158.175	9.94	66.65	102.22	0.13	6.03	14,027
0.001	0.061	156.736	17.01	112.43	192.94	0.23	9.27	23,663
0.002	0.030	159.079	14.76	163.31	221.48	0.33	6.56	34,371
0.002	0.021	157.463	16.63	271.10	207.51	0.54	7.44	57,058
0.001	0.023	156.898	27.53	458.53	404.05	0.92	14.15	96,504
0.002	0.044	158.262	79.65	612.31	1,427.94	1.23	35.61	128,871
0.001	0.027	155.194	66.60	841.35	1,338.31	1.69	31.23	177,076
0.003	0.224	265.154	24.28	54.93	84.71	0.09	7.96	9,436
0.002	0.176	239.305	20.32	108.00	168.57	0.18	13.68	18,552
0.002	0.126	238.803	39.79	221.69	385.13	0.36	20.14	38,082
0.002	0.045	237.291	22.87	282.36	266.90	0.46	9.21	48,504
0.002	0.108	238.264	62.44	419.57	749.13	0.69	32.52	72,075
0.002	0.053	238.264	93.00	1,176.17	1,621.68	1.93	45.25	202,048
0.002	0.122	210.741	13.59	37.80	65.06	0.08	4.66	8,072

0.002	0.091	194.036	11.72	75.10	112.46	0.15	7.51	16,037
0.002	0.052	190.865	15.01	128.66	147.67	0.26	7.43	27,472
0.002	0.038	192.265	19.29	183.88	236.81	0.37	7.67	39,264
0.002	0.030	191.331	25.44	286.86	276.59	0.58	9.63	61,253
0.002	0.043	191.267	58.08	514.70	660.75	1.05	24.73	109,905
0.002	0.030	194.602	62.56	794.15	1,248.04	1.62	26.52	169,576
0.002	0.030	193.002	152.58	1,812.80	2,725.83	3.70	60.83	387,090
0.003	0.189	293.594	19.98	64.98	95.64	0.11	7.53	11,678
0.003	0.216	264.327	27.25	120.68	234.83	0.21	17.75	21,690
0.002	0.128	260.387	34.79	208.43	358.56	0.36	18.41	37,462
0.003	0.102	263.648	46.50	320.40	553.89	0.55	22.30	57,586
0.003	0.059	262.585	47.97	523.79	563.57	0.90	21.27	94,141
0.003	0.008	263.880	25.44	909.18	219.88	1.56	4.74	163,407
0.003	0.307	262.792	521.94	1,257.44	5,732.49	2.16	263.86	226,001
0.004	0.113	255.735	3.75	17.68	23.30	0.04	1.25	2,813
0.003	0.103	255.735	7.18	22.65	41.67	0.06	2.07	5,115
0.003	0.139	255.735	24.14	107.36	96.57	0.15	6.38	11,764
0.003	0.127	255.735	17.46	116.03	124.60	0.21	8.89	17,901
0.003	0.073	255.735	31.96	247.77	248.54	0.50	12.63	44,498
0.003	0.038	255.735	28.69	106.61	258.89	0.61	8.00	53,960
0.003	0.036	255.735	38.68	144.40	323.16	0.75	10.78	75,953
0.002	0.146	216.755	11.509	19.124	54.882	0.060	4.244	6316.311
0.002	0.121	196.739	18.143	51.859	143.959	0.164	10.544	17128.612
0.002	0.057	198.818	20.482	95.643	171.398	0.302	9.067	31590.040
0.002	0.045	198.739	25.894	126.970	240.536	0.400	9.587	41936.951
0.002	0.037	200.897	39.222	226.520	379.533	0.714	13.802	74817.383
0.002	0.049	200.000	85.703	397.178	831.754	1.253	32.218	131183.761
0.002	0.047	198.812	105.862	540.073	1632.720	1.703	42.541	178380.423
0.002	0.040	202.045	201.071	1079.189	2764.102	3.404	70.943	356444.954

**2009**

		2009		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
AvgHP		Equipment	MaxHP	ROG	CO	NOX	SOX
0	46	Aerial Lifts	50	0.213	0.866	1.541	0.002
50	74		120	0.1542	0.778	1.720	0.002
120	130		175	0.081	0.778	1.337	0.002
175	210		250	0.341	0.778	3.561	0.002
250	380		500	0.146	0.778	2.156	0.002
0	12	Air Compressors	15	0.560	1.958	3.241	0.004
15	24		25	0.634	1.632	2.671	0.003
25	37		50	1.458	3.456	2.939	0.004
50	78		120	0.607	1.950	3.586	0.003
120	147		175	0.402	1.574	3.212	0.003
175	218		250	0.266	0.743	3.010	0.003
250	385		500	0.237	0.857	2.689	0.003
500	595		750	0.242	0.857	2.761	0.003
750	808		1000	0.302	1.098	3.446	0.003
0	39	Bore/Drill Rigs	50	0.465	1.216	2.714	0.003
50	82		120	0.208	1.019	2.523	0.002
120	149		175	0.183	1.073	2.403	0.003
175	208		250	0.134	1.060	2.400	0.003
250	349		500	0.122	1.044	2.054	0.002
500	612		750	0.083	1.074	1.526	0.003
750	919		1000	0.078	1.055	2.160	0.003
1000	2667		9999	0.062	1.056	2.063	0.003
0	9	Cement and Mortar	15	0.415	1.968	2.677	0.005
15	25		25	0.678	1.795	3.042	0.004
0	18	Concrete/Industrial	25	0.508	1.708	3.260	0.005
25	33		50	1.818	4.545	4.288	0.005
50	81		120	0.807	2.814	5.094	0.005
120	175		175	0.533	2.286	4.529	0.005
0	41	Cranes	50	0.692	0.826	1.807	0.002
50	89		120	0.413	0.749	3.242	0.001
120	148		175	0.252	0.757	2.608	0.001
175	217		250	0.209	0.754	2.429	0.001
250	336		500	0.159	0.752	2.044	0.001
500	567		750	0.076	0.751	1.292	0.001
750	938		1000	0.311	0.748	3.325	0.001
1000	1030		9999	0.097	0.752	1.831	0.001
0	43	Crawler Tractors	50	1.188	1.327	2.795	0.002
50	87		120	0.399	1.228	3.323	0.002
120	150		175	0.281	1.215	3.056	0.002
175	203		250	0.201	1.219	2.773	0.002
250	341		500	0.182	1.225	2.555	0.002
500	570		750	0.156	1.217	2.299	0.002
750	828		1000	0.203	1.222	3.091	0.002

1000	1527		9999	0.139	1.168	2.506	0.002
0	45	Crushing/Proc	50	2.423	5.767	4.797	0.006
50	85		120	0.993	3.202	5.817	0.005
120	171		175	0.659	2.588	5.198	0.005
175	250		250	0.433	1.198	4.870	0.005
250	382		500	0.387	1.366	4.326	0.004
500	602		750	0.394	1.331	4.477	0.004
750	1337		9999	0.495	1.760	5.631	0.004
0	16	Dumpers/Tend	25	0.322	0.976	1.875	0.003
0	36	Excavators	50	0.329	1.083	1.969	0.002
50	82		120	0.251	0.962	2.378	0.002
120	146		175	0.197	0.974	2.288	0.002
175	218		250	0.141	0.974	2.250	0.002
250	329		500	0.105	0.968	1.711	0.002
500	578		750	0.107	0.965	1.748	0.002
750	843		1000	0.165	0.968	2.567	0.002
1000	1569		9999	0.100	0.963	1.952	0.002
0	42	Forklifts	50	0.508	0.638	1.272	0.001
50	82		120	0.186	0.572	1.552	0.001
120	141		175	0.138	0.573	1.488	0.001
175	208		250	0.155	0.574	1.758	0.001
250	344		500	0.143	0.575	1.633	0.001
500	880		1000	0.327	0.573	3.140	0.001
0	11	Generator Sets	15	0.735	3.019	4.870	0.007
15	19		25	0.744	2.516	4.118	0.005
25	33		50	1.585	4.024	4.251	0.005
50	84		120	0.783	2.740	5.071	0.005
120	153		175	0.513	2.215	4.535	0.005
175	229		250	0.337	1.040	4.255	0.005
250	363		500	0.302	1.177	3.881	0.004
500	586		750	0.312	1.177	3.983	0.004
750	1130		9999	0.422	1.512	4.979	0.004
0	39	Graders	50	1.285	1.157	2.648	0.002
50	91		120	0.564	1.107	4.282	0.002
120	148		175	0.365	1.135	3.663	0.002
175	204		250	0.148	1.121	2.327	0.002
250	293		500	0.110	1.111	1.553	0.002
500	796		1000	0.296	1.109	3.698	0.002
1000	1993		9999	0.171	1.107	2.635	0.002
0	38	Off-Highway T	50	0.812	1.300	2.544	0.002
50	75		120	0.387	1.183	3.250	0.002
120	158		175	0.240	1.175	2.742	0.002
175	214		250	0.208	1.168	2.885	0.002
250	334		500	0.153	1.172	2.267	0.002
500	574		750	0.143	1.176	2.176	0.002
750	1000		1000	0.473	1.172	5.345	0.002
1000	1726		9999	0.346	1.139	4.142	0.002
0	29	Off-Highway T	50	0.634	0.651	2.135	0.002
50	87		120	0.431	0.599	3.215	0.002
120	159		175	0.252	0.603	2.536	0.002
175	211		250	0.219	0.602	2.666	0.002
250	372		500	0.165	0.610	2.101	0.002

500	656		750	0.208	0.612	2.505	0.002
750	897		1000	0.185	0.607	2.758	0.002
1000	1764		9999	0.176	0.614	2.592	0.002
0	38	Other Constr	50	0.552	1.338	2.298	0.002
50	82		120	0.338	1.192	2.967	0.002
120	152		175	0.278	1.189	3.025	0.002
175	217		250	0.214	1.203	2.928	0.002
250	357		500	0.174	1.210	2.418	0.002
500	598		750	0.121	1.196	1.972	0.002
750	830		1000	0.173	1.201	2.723	0.002
1000	1127		9999	0.175	1.163	2.670	0.002
0	35	Other General	50	0.558	0.972	1.934	0.002
50	73		120	0.306	0.869	2.528	0.002
120	149		175	0.221	0.872	2.393	0.002
175	209		250	0.234	0.875	2.805	0.002
250	355		500	0.143	0.874	1.938	0.002
500	592		750	0.112	0.875	1.713	0.002
750	885		1000	0.108	0.872	2.062	0.002
1000	2000		9999	0.049	0.872	1.419	0.002
0	36	Other Material	50	0.848	1.196	2.398	0.002
50	93		120	0.312	1.081	2.766	0.002
120	145		175	0.243	1.078	2.630	0.002
175	218		250	0.218	1.076	2.774	0.002
250	331		500	0.163	1.074	2.205	0.002
500	565		750	0.072	1.078	1.392	0.002
750	923		1000	0.067	1.078	1.740	0.002
1000	1050		9999	0.061	1.078	1.689	0.002
0	39	Pavers	50	0.800	1.429	2.467	0.002
50	80		120	0.339	1.273	2.936	0.002
120	158		175	0.251	1.282	2.768	0.002
175	213		250	0.086	1.285	1.833	0.002
250	327		500	0.085	1.264	1.476	0.002
500	750		750	0.054	1.280	0.986	0.002
0	35	Paving Equipn	50	0.422	1.294	1.894	0.002
50	89		120	0.293	1.178	2.584	0.002
120	148		175	0.175	1.171	2.150	0.002
175	216		250	0.159	1.174	2.221	0.002
250	339		500	0.141	1.167	1.992	0.002
500	605		750	0.086	1.176	1.568	0.002
750	842		1000	0.177	1.175	2.596	0.002
0	8	Plate Compact	15	0.288	1.492	1.821	0.004
0	13	Pressure Wash	15	0.298	1.224	1.974	0.003
15	19		25	0.302	1.020	1.669	0.002
25	38		50	0.514	1.382	1.671	0.002
50	64		120	0.288	1.059	1.964	0.002
0	8	Pumps	15	0.863	3.019	4.997	0.007
15	21		25	0.977	2.516	4.118	0.005
25	37		50	1.691	4.231	4.295	0.005
50	84		120	0.808	2.782	5.147	0.005
120	151		175	0.530	2.250	4.604	0.005
175	217		250	0.349	1.060	4.319	0.005
250	372		500	0.313	1.223	3.925	0.004

500	615		750	0.322	1.223	4.029	0.004
750	1460		9999	0.429	1.564	5.033	0.004
0	36	Rollers	50	0.536	1.181	2.093	0.002
50	87		120	0.326	1.066	2.829	0.002
120	144		175	0.169	1.059	2.118	0.002
175	213		250	0.209	1.063	2.835	0.002
250	335		500	0.233	1.081	2.922	0.002
500	521		750	0.233	1.061	3.166	0.002
0	47	Rough Terrain	50	0.531	1.273	2.237	0.002
50	96		120	0.226	1.146	2.414	0.002
120	130		175	0.147	1.142	2.051	0.002
175	208		250	0.267	1.150	3.195	0.002
250	374		500	0.143	1.131	2.476	0.002
500	625		750	0.600	1.143	5.980	0.002
0	42	Rubber Tired D	50	1.167	1.060	2.579	0.002
50	82		120	0.496	0.975	3.754	0.002
120	150		175	0.388	0.970	3.859	0.002
175	211		250	0.288	0.973	3.238	0.002
250	354		500	0.310	0.984	3.494	0.002
500	584		750	0.212	0.969	2.915	0.002
0	42	Rubber Tired L	50	0.896	0.987	2.272	0.002
50	86		120	0.361	0.881	2.862	0.002
120	150		175	0.243	0.888	2.547	0.002
175	206		250	0.146	0.886	2.140	0.002
250	320		500	0.152	0.885	2.043	0.002
500	600		750	0.139	0.861	1.821	0.002
750	837		1000	0.144	0.887	2.378	0.002
1000	1521		9999	0.133	0.884	2.204	0.002
0	36	Scrapers	50	1.484	1.260	3.170	0.003
50	84		120	0.350	1.167	3.439	0.002
120	166		175	0.383	1.156	4.134	0.002
175	225		250	0.397	1.130	4.541	0.002
250	381		500	0.249	1.140	3.255	0.002
500	565		750	0.189	1.141	2.666	0.002
750	950		1000	0.593	1.138	6.460	0.002
1000	1923		9999	0.227	1.163	3.362	0.002
0	6	Signal Boards	15	0.542	2.845	3.397	0.007
15	37		50	1.938	4.794	4.582	0.006
50	82		120	0.879	3.000	5.486	0.005
120	158		175	0.578	2.428	4.898	0.005
175	216		250	0.461	1.366	5.553	0.006
0	43	Skid Steer Loa	50	0.410	1.379	1.968	0.002
50	71		120	0.175	1.236	1.996	0.002
120	153		175	0.185	1.226	2.164	0.002
175	201		250	0.143	1.218	2.024	0.002
250	277		500	0.111	1.201	1.707	0.002
500	530		750	0.041	1.233	0.865	0.002
750	1000		1000	0.243	1.233	3.012	0.002
0	36	Surfacing Equ	50	0.439	0.846	1.736	0.002
50	89		120	0.194	0.749	1.885	0.002
120	151		175	0.174	0.746	1.984	0.001
175	216		250	0.129	0.757	1.937	0.002

250	362		500	0.080	0.748	1.362	0.002
500	615		750	0.054	0.750	1.068	0.002
750	814		1000	0.108	0.752	1.880	0.002
1000	1141		9999	0.110	0.737	1.792	0.001
0	36	Sweepers/Scrubbers	50	0.854	1.544	2.645	0.003
50	78		120	0.431	1.393	3.483	0.002
120	159		175	0.473	1.390	4.716	0.002
175	204		250	0.294	1.381	3.570	0.002
250	303		500	0.197	1.387	2.687	0.002
500	848		1000	0.048	1.387	1.777	0.002
0	38	Tractors/Loaders	50	0.624	0.980	2.076	0.002
50	83		120	0.258	0.918	2.349	0.002
120	144		175	0.180	0.898	2.109	0.002
175	204		250	0.130	0.900	2.076	0.002
250	320		500	0.125	0.906	1.931	0.002
500	575		750	0.104	0.890	1.640	0.002
750	871		1000	0.094	0.928	1.993	0.002
1000	2006		9999	0.134	0.904	2.253	0.002
0	40	Trenchers	50	0.666	1.634	2.767	0.003
50	82		120	0.491	1.475	4.063	0.003
120	144		175	0.411	1.449	4.393	0.002
175	218		250	0.309	1.470	3.944	0.003
250	359		500	0.174	1.462	2.579	0.003
500	619		750	0.082	1.466	1.603	0.003
750	860		1000	0.582	1.462	6.510	0.003
0	11	Welders	15	0.525	1.836	3.039	0.004
15	20		25	0.594	1.530	2.504	0.003
25	46		50	1.242	2.992	2.701	0.003
50	70		120	0.540	1.777	3.277	0.003
120	174		175	0.356	1.435	2.934	0.003
175	211		250	0.236	0.680	2.751	0.003
250	297		500	0.211	0.790	2.473	0.003
0	29	Water Trucks	50	0.634	0.651	2.135	0.002
50	87		120	0.431	0.599	3.215	0.002
120	159		175	0.252	0.603	2.536	0.002
175	211		250	0.219	0.602	2.666	0.002
250	372		500	0.165	0.610	2.101	0.002
500	656		750	0.208	0.612	2.505	0.002
750	897		1000	0.185	0.607	2.758	0.002
1000	1764		9999	0.176	0.614	2.592	0.002

2020

AvgHP		2020		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
		Equipment	MaxHP	ROG	CO	NOX	SOX
0	46	Aerial Lifts	50	0.054	0.866	0.911	0.002
50	74		120	0.037	0.778	0.576	0.002



120	130		175	0.031	0.778	0.303	0.002
175	210		250	0.016	0.778	0.080	0.002
250	380		500	0.022	0.778	0.197	0.002
0	12	Air Compress	15	0.356	1.707	2.209	0.004
15	24		25	0.375	1.196	2.194	0.003
25	37		50	0.541	2.622	2.233	0.004
50	78		120	0.263	1.812	1.797	0.003
120	147		175	0.202	1.565	1.413	0.003
175	218		250	0.154	0.549	1.199	0.003
250	385		500	0.150	0.525	1.065	0.003
500	595		750	0.150	0.525	1.092	0.003
750	808		1000	0.165	0.570	1.965	0.003
0	39	Bore/Drill Rigs	50	0.376	1.197	2.334	0.003
50	82		120	0.129	1.037	1.541	0.002
120	149		175	0.092	1.068	0.940	0.003
175	208		250	0.075	1.044	0.908	0.002
250	349		500	0.065	1.044	0.708	0.002
500	612		750	0.057	1.059	0.619	0.003
750	919		1000	0.070	1.055	1.533	0.003
1000	2667		9999	0.103	1.056	2.166	0.003
0	9	Cement and M	15	0.370	1.943	2.320	0.005
15	25		25	0.405	1.343	2.488	0.004
0	18	Concrete/Indu	25	0.500	1.708	3.163	0.005
25	33		50	0.583	3.324	3.063	0.005
50	81		120	0.294	2.581	2.309	0.005
120	175		175	0.224	2.243	1.697	0.005
0	41	Cranes	50	0.628	0.825	1.724	0.002
50	89		120	0.221	0.749	1.838	0.001
120	148		175	0.162	0.756	1.605	0.001
175	217		250	0.116	0.754	1.315	0.001
250	336		500	0.097	0.753	1.113	0.001
500	567		750	0.073	0.750	0.894	0.001
750	938		1000	0.243	0.748	2.646	0.001
1000	1030		9999	0.055	0.752	0.680	0.001
0	43	Crawler Tract	50	0.921	1.327	2.420	0.002
50	87		120	0.321	1.226	2.577	0.002
120	150		175	0.214	1.212	2.089	0.002
175	203		250	0.162	1.217	1.986	0.002
250	341		500	0.135	1.223	1.553	0.002
500	570		750	0.115	1.218	1.345	0.002
750	828		1000	0.208	1.224	3.103	0.002
1000	1527		9999	0.150	1.168	2.523	0.002
0	45	Crushing/Proc	50	0.739	4.065	3.391	0.006
50	85		120	0.369	2.904	2.534	0.005
120	171		175	0.287	2.523	1.866	0.005
175	250		250	0.226	0.878	1.572	0.005
250	382		500	0.220	0.841	1.403	0.004
500	602		750	0.219	0.841	1.432	0.004
750	1337		9999	0.257	0.900	2.886	0.004
0	16	Dumpers/Tend	25	0.261	0.889	1.648	0.003
0	36	Excavators	50	0.237	1.082	1.540	0.002
50	82		120	0.120	0.964	1.180	0.002

120	146		175	0.092	0.973	0.870	0.002
175	218		250	0.071	0.972	0.774	0.002
250	329		500	0.061	0.969	0.600	0.002
500	578		750	0.068	0.966	0.686	0.002
750	843		1000	0.063	0.965	1.343	0.002
1000	1569		9999	0.061	0.963	1.187	0.002
0	42	Forklifts	50	0.236	0.638	0.942	0.001
50	82		120	0.097	0.572	0.831	0.001
120	141		175	0.071	0.573	0.667	0.001
175	208		250	0.062	0.574	0.652	0.001
250	344		500	0.053	0.575	0.490	0.001
500	880		1000	0.017	0.573	0.469	0.001
0	11	Generator Set	15	0.484	2.632	3.384	0.007
15	19		25	0.537	1.843	3.382	0.005
25	33		50	0.574	3.078	3.174	0.005
50	84		120	0.301	2.533	2.577	0.005
120	153		175	0.222	2.188	2.024	0.005
175	229		250	0.162	0.769	1.714	0.005
250	363		500	0.154	0.752	1.539	0.004
500	586		750	0.156	0.752	1.576	0.004
750	1130		9999	0.200	0.816	2.843	0.004
0	39	Graders	50	1.076	1.158	2.381	0.002
50	91		120	0.418	1.103	3.157	0.002
120	148		175	0.242	1.123	2.260	0.002
175	204		250	0.151	1.117	1.912	0.002
250	293		500	0.138	1.109	1.270	0.002
500	796		1000	0.303	1.109	3.798	0.002
1000	1993		9999	0.206	1.107	2.740	0.002
0	38	Off-Highway T	50	0.462	1.303	2.036	0.002
50	75		120	0.204	1.177	1.822	0.002
120	158		175	0.124	1.174	1.259	0.002
175	214		250	0.101	1.169	1.122	0.002
250	334		500	0.075	1.165	0.717	0.002
500	574		750	0.092	1.171	0.891	0.002
750	1000		1000	0.068	1.172	1.043	0.002
1000	1726		9999	0.116	1.202	1.665	0.002
0	29	Off-Highway T	50	0.341	0.656	1.774	0.002
50	87		120	0.192	0.595	1.513	0.002
120	159		175	0.124	0.602	1.004	0.002
175	211		250	0.110	0.602	0.958	0.002
250	372		500	0.098	0.608	0.896	0.002
500	656		750	0.125	0.606	1.168	0.002
750	897		1000	0.121	0.602	1.831	0.002
1000	1764		9999	0.108	0.612	1.523	0.002
0	38	Other Construc	50	0.466	1.336	2.092	0.002
50	82		120	0.226	1.195	1.982	0.002
120	152		175	0.169	1.189	1.708	0.002
175	217		250	0.123	1.202	1.496	0.002
250	357		500	0.097	1.202	1.095	0.002
500	598		750	0.089	1.199	1.091	0.002
750	830		1000	0.076	1.187	1.488	0.002
1000	1127		9999	0.097	1.163	1.648	0.002

0	35	Other General	50	0.338	0.972	1.579	0.002
50	73		120	0.159	0.869	1.388	0.002
120	149		175	0.096	0.872	0.880	0.002
175	209		250	0.085	0.875	0.912	0.002
250	355		500	0.074	0.874	0.705	0.002
500	592		750	0.062	0.875	0.573	0.002
750	885		1000	0.097	0.872	1.660	0.002
1000	2000		9999	0.021	0.872	0.779	0.002
0	36	Other Material	50	0.515	1.196	2.032	0.002
50	93		120	0.127	1.081	1.227	0.002
120	145		175	0.104	1.078	0.935	0.002
175	218		250	0.120	1.076	1.423	0.002
250	331		500	0.117	1.074	1.269	0.002
500	565		750	0.081	1.078	0.820	0.002
750	923		1000	0.036	1.078	0.932	0.002
1000	1050		9999	0.083	1.078	1.429	0.002
0	39	Pavers	50	0.573	1.427	1.979	0.002
50	80		120	0.204	1.274	1.839	0.002
120	158		175	0.119	1.282	1.212	0.002
175	213		250	0.076	1.282	1.154	0.002
250	327		500	0.072	1.264	0.886	0.002
500	750		750	0.050	1.280	0.493	0.002
0	35	Paving Equipn	50	0.231	1.293	1.403	0.002
50	89		120	0.148	1.177	1.343	0.002
120	148		175	0.092	1.170	0.907	0.002
175	216		250	0.090	1.174	1.143	0.002
250	339		500	0.080	1.165	0.968	0.002
500	605		750	0.070	1.174	0.971	0.002
750	842		1000	0.033	1.175	0.823	0.002
0	8	Plate Compac	15	0.284	1.492	1.781	0.004
0	13	Pressure Was	15	0.196	1.067	1.372	0.003
15	19		25	0.218	0.747	1.371	0.002
25	38		50	0.167	1.045	1.233	0.002
50	64		120	0.100	0.975	0.997	0.002
0	8	Pumps	15	0.549	2.632	3.406	0.007
15	21		25	0.578	1.843	3.382	0.005
25	37		50	0.629	3.246	3.219	0.005
50	84		120	0.320	2.576	2.616	0.005
120	151		175	0.237	2.225	2.057	0.005
175	217		250	0.174	0.782	1.743	0.005
250	372		500	0.166	0.762	1.561	0.004
500	615		750	0.168	0.762	1.599	0.004
750	1460		9999	0.211	0.828	2.878	0.004
0	36	Rollers	50	0.364	1.180	1.701	0.002
50	87		120	0.152	1.063	1.456	0.002
120	144		175	0.085	1.059	0.920	0.002
175	213		250	0.082	1.062	1.032	0.002
250	335		500	0.092	1.076	1.061	0.002
500	521		750	0.033	1.061	0.264	0.002
0	47	Rough Terrain	50	0.420	1.273	1.807	0.002
50	96		120	0.080	1.146	0.986	0.002
120	130		175	0.060	1.142	0.751	0.002

175	208		250	0.047	1.145	0.647	0.002
250	374		500	0.037	1.128	0.523	0.002
500	625		750	0.043	1.143	0.536	0.002
0	42	Rubber Tired L	50	0.509	1.072	1.779	0.002
50	82		120	0.389	0.980	2.922	0.002
120	150		175	0.301	0.969	2.840	0.002
175	211		250	0.256	0.973	2.571	0.002
250	354		500	0.221	0.983	2.230	0.002
500	584		750	0.189	0.969	2.420	0.002
0	42	Rubber Tired L	50	0.561	0.989	1.901	0.002
50	86		120	0.210	0.877	1.696	0.002
120	150		175	0.143	0.888	1.273	0.002
175	206		250	0.110	0.885	1.238	0.002
250	320		500	0.109	0.880	1.091	0.002
500	600		750	0.105	0.871	1.001	0.002
750	837		1000	0.118	0.885	1.901	0.002
1000	1521		9999	0.082	0.884	1.486	0.002
0	36	Scrapers	50	1.719	1.260	3.304	0.003
50	84		120	0.354	1.166	3.221	0.002
120	166		175	0.241	1.154	2.349	0.002
175	225		250	0.225	1.131	2.455	0.002
250	381		500	0.161	1.138	1.825	0.002
500	565		750	0.132	1.138	1.508	0.002
750	950		1000	0.593	1.138	6.460	0.002
1000	1923		9999	0.293	1.163	3.738	0.002
0	6	Signal Boards	15	0.542	2.845	3.397	0.007
15	37		50	0.616	3.470	3.223	0.006
50	82		120	0.308	2.733	2.445	0.005
120	158		175	0.233	2.374	1.801	0.005
175	216		250	0.214	1.000	1.833	0.006
0	43	Skid Steer Load	50	0.169	1.379	1.360	0.002
50	71		120	0.073	1.233	0.923	0.002
120	153		175	0.059	1.223	0.626	0.002
175	201		250	0.038	1.204	0.481	0.002
250	277		500	0.028	1.201	0.220	0.002
500	530		750	0.066	1.233	0.899	0.002
750	1000		1000	0.112	1.233	1.622	0.002
0	36	Surfacing Equip	50	0.169	0.850	1.278	0.002
50	89		120	0.104	0.752	1.089	0.002
120	151		175	0.097	0.745	1.107	0.001
175	216		250	0.067	0.756	0.972	0.002
250	362		500	0.046	0.749	0.554	0.002
500	615		750	0.045	0.745	0.631	0.001
750	814		1000	0.083	0.748	1.531	0.002
1000	1141		9999	0.060	0.737	1.176	0.001
0	36	Sweepers/Scrub	50	0.641	1.544	2.321	0.003
50	78		120	0.248	1.393	2.042	0.002
120	159		175	0.220	1.390	2.099	0.002
175	204		250	0.099	1.381	1.132	0.002
250	303		500	0.208	1.387	2.478	0.002
500	848		1000	0.116	1.387	1.927	0.002
0	38	Tractors/Loaders	50	0.320	0.986	1.621	0.002

50	83		120	0.128	0.908	1.226	0.002
120	144		175	0.095	0.894	0.890	0.002
175	204		250	0.087	0.900	1.009	0.002
250	320		500	0.075	0.895	0.766	0.002
500	575		750	0.103	0.896	1.149	0.002
750	871		1000	0.048	0.911	1.080	0.002
1000	2006		9999	0.069	0.904	1.269	0.002
0	40	Trenchers	50	0.476	1.633	2.350	0.003
50	82		120	0.321	1.472	2.774	0.003
120	144		175	0.221	1.449	2.241	0.002
175	218		250	0.206	1.467	2.417	0.003
250	359		500	0.122	1.458	1.394	0.003
500	619		750	0.037	1.464	0.281	0.003
750	860		1000	0.609	1.462	6.681	0.003
0	11	Welders	15	0.334	1.601	2.071	0.004
15	20		25	0.351	1.121	2.057	0.003
25	46		50	0.475	2.298	2.047	0.003
50	70		120	0.230	1.653	1.660	0.003
120	174		175	0.174	1.427	1.306	0.003
175	211		250	0.131	0.501	1.109	0.003
250	297		500	0.126	0.482	0.985	0.003
0	29	Water Trucks	50	0.341	0.656	1.774	0.002
50	87		120	0.192	0.595	1.513	0.002
120	159		175	0.124	0.602	1.004	0.002
175	211		250	0.110	0.602	0.958	0.002
250	372		500	0.098	0.608	0.896	0.002
500	656		750	0.125	0.606	1.168	0.002
750	897		1000	0.121	0.602	1.831	0.002
1000	1764		9999	0.108	0.612	1.523	0.002

g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.111	179.277	9.83	39.91	71.05	0.08	5.12	8,267
0.114	161.199	11.41	57.61	127.29	0.11	8.41	11,932
0.056	161.168	10.61	101.52	174.41	0.20	7.31	21,028
0.181	161.179	71.60	163.42	747.74	0.32	37.97	33,848
0.067	161.179	55.48	295.70	819.21	0.58	25.45	61,248
0.239	272.784	6.71	23.50	38.90	0.05	2.87	3,273
0.193	272.784	15.22	39.17	64.11	0.08	4.62	6,547
0.331	272.784	53.95	127.88	108.74	0.13	12.24	10,093
0.322	272.784	47.38	152.11	279.75	0.25	25.10	21,277
0.177	272.784	59.10	231.35	472.12	0.45	26.08	40,099
0.101	272.784	57.90	162.04	656.13	0.67	21.97	59,467
0.092	272.784	91.32	329.76	1,035.28	1.03	35.52	105,022
0.094	272.784	143.81	509.64	1,642.73	1.63	55.67	162,306
0.104	272.784	243.79	886.82	2,784.05	2.22	84.12	220,409
0.204	302.703	18.26	47.76	106.57	0.11	8.01	11,888
0.162	253.631	17.14	83.89	207.73	0.20	13.30	20,881
0.115	267.032	27.24	159.35	356.90	0.38	17.08	39,664
0.071	263.755	27.83	220.14	498.68	0.52	14.79	54,796
0.068	259.757	42.77	364.39	717.14	0.87	23.71	90,703
0.054	267.302	50.67	657.17	934.13	1.56	32.83	163,579
0.048	262.715	71.98	969.95	1,985.44	2.31	44.34	241,435
0.046	262.792	166.45	2,815.34	5,500.44	6.69	122.19	700,778
0.165	318.248	3.74	17.71	24.09	0.04	1.49	2,864
0.210	318.248	16.95	44.88	76.06	0.10	5.26	7,956
0.178	414.859	9.14	30.75	58.69	0.09	3.20	7,467
0.436	414.859	60.01	149.98	141.49	0.18	14.39	13,690
0.423	414.859	65.36	227.94	412.65	0.39	34.26	33,604
0.234	414.859	93.24	400.01	792.64	0.82	40.96	72,600
0.189	165.359	28.13	33.55	73.40	0.06	7.66	6,718
0.240	150.034	36.72	66.64	288.36	0.13	21.34	13,345
0.138	151.595	37.23	111.95	385.71	0.21	20.44	22,419
0.110	150.994	45.32	163.62	527.05	0.31	23.96	32,766
0.084	150.576	53.52	252.73	687.13	0.48	28.30	50,610
0.043	150.468	43.30	426.18	732.70	0.81	24.11	85,344
0.164	149.774	291.15	701.25	3,117.82	1.34	154.13	140,428
0.043	150.667	99.81	774.95	1,885.88	1.48	43.86	155,187
0.332	244.948	50.48	56.42	118.83	0.10	14.13	10,413
0.266	226.628	34.65	106.66	288.58	0.19	23.06	19,684
0.160	224.250	41.99	181.71	457.03	0.32	23.86	33,535
0.106	224.969	40.75	247.27	562.48	0.44	21.56	45,634
0.096	226.060	62.09	417.32	870.54	0.74	32.84	77,017
0.081	224.627	89.11	693.91	1,310.92	1.22	46.29	128,063
0.089	225.547	168.43	1,012.12	2,559.66	1.78	73.85	186,790

0.063	215.490	211.52	1,782.39	3,826.04	3.14	96.20	328,945
0.547	443.274	109.05	259.51	215.86	0.26	24.63	19,947
0.533	443.274	84.41	272.17	494.44	0.44	45.27	37,678
0.294	443.274	112.76	442.53	888.91	0.85	50.21	75,800
0.163	443.274	108.13	299.38	1,217.41	1.25	40.78	110,818
0.150	443.274	147.99	521.78	1,652.43	1.66	57.17	169,331
0.151	443.274	237.14	801.54	2,695.26	2.68	91.19	266,851
0.170	443.274	661.54	2,352.66	7,529.31	5.96	227.74	592,657
0.112	215.954	5.15	15.62	30.00	0.04	1.79	3,455
0.156	222.387	11.77	38.69	70.39	0.08	5.58	7,948
0.181	197.605	20.52	78.67	194.47	0.15	14.80	16,160
0.116	199.967	28.74	142.18	334.19	0.28	16.91	29,203
0.070	200.019	30.85	212.75	491.56	0.42	15.33	43,698
0.056	198.795	34.41	318.07	562.44	0.62	18.27	65,332
0.057	198.170	61.91	557.59	1,010.04	1.09	32.86	114,530
0.081	198.838	139.37	815.94	2,163.99	1.60	68.59	167,595
0.053	197.811	157.01	1,511.16	3,062.83	2.96	83.62	310,393
0.148	117.014	21.56	27.04	53.96	0.05	6.27	4,963
0.125	105.000	15.34	47.13	127.81	0.08	10.33	8,649
0.079	105.128	19.44	80.94	210.24	0.14	11.17	14,853
0.083	105.400	32.32	119.55	366.00	0.21	17.22	21,939
0.076	105.464	49.05	197.53	561.16	0.35	26.22	36,250
0.175	105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
0.297	420.542	8.09	33.21	53.57	0.07	3.27	4,626
0.265	420.542	14.14	47.81	78.24	0.10	5.04	7,990
0.401	420.542	52.29	132.81	140.29	0.18	13.23	13,878
0.394	420.542	65.80	230.12	425.94	0.41	33.14	35,326
0.218	420.542	78.42	338.97	693.90	0.72	33.33	64,343
0.128	420.542	77.17	238.15	974.44	1.08	29.29	96,304
0.119	420.542	109.61	427.33	1,408.77	1.50	43.32	152,657
0.121	420.542	182.73	689.85	2,334.15	2.48	70.90	246,438
0.149	420.542	476.40	1,708.93	5,626.33	4.78	168.27	475,212
0.344	222.989	50.31	45.31	103.69	0.08	13.48	8,733
0.347	213.430	51.31	100.78	389.68	0.19	31.60	19,421
0.201	218.726	54.00	167.92	541.97	0.31	29.67	32,360
0.073	216.072	30.29	229.12	475.52	0.42	14.94	44,155
0.057	214.203	32.28	325.86	455.17	0.60	16.72	62,798
0.131	213.737	235.27	882.83	2,943.41	1.62	104.21	170,135
0.077	213.348	339.81	2,206.16	5,250.71	4.06	154.36	425,161
0.263	252.659	30.59	48.95	95.79	0.09	9.90	9,515
0.265	230.057	28.82	88.20	242.18	0.16	19.76	17,146
0.141	228.391	37.97	185.72	433.37	0.34	22.25	36,103
0.106	227.009	44.38	249.72	616.89	0.46	22.68	48,544
0.082	227.786	51.11	391.89	758.00	0.73	27.42	76,180
0.077	228.672	82.23	674.67	1,248.02	1.25	43.89	131,152
0.272	227.753	473.17	1,171.61	5,344.58	2.17	271.92	227,753
0.157	221.372	597.07	1,965.83	7,150.01	3.65	270.32	382,144
0.219	214.862	18.49	18.96	62.22	0.06	6.37	6,261
0.284	197.770	37.53	52.13	279.89	0.16	24.73	17,218
0.149	199.046	40.12	95.75	402.98	0.30	23.61	31,626
0.112	198.786	46.14	127.00	562.64	0.40	23.54	41,947
0.080	201.372	61.45	227.06	782.35	0.72	29.85	74,995

0.104	202.001	136.38	401.15	1,643.14	1.27	68.51	132,496
0.082	200.550	166.24	544.79	2,474.88	1.72	73.20	179,939
0.080	202.650	310.30	1,082.42	4,573.51	3.41	140.71	357,513
0.204	243.312	20.98	50.84	87.32	0.09	7.77	9,247
0.227	216.757	27.60	97.19	241.97	0.17	18.48	17,679
0.155	216.236	42.32	181.27	461.23	0.31	23.70	32,974
0.112	218.885	46.50	261.01	635.10	0.45	24.31	47,477
0.091	220.010	62.02	431.63	862.81	0.75	32.43	78,513
0.064	217.573	72.33	714.89	1,178.87	1.24	38.19	130,038
0.081	218.376	143.85	996.62	2,260.74	1.73	67.60	181,286
0.086	211.518	197.64	1,310.12	3,008.21	2.28	97.15	238,310
0.191	199.186	19.59	34.13	67.89	0.07	6.71	6,992
0.207	177.921	22.36	63.57	185.06	0.12	15.18	13,022
0.127	178.621	32.94	130.06	356.90	0.25	19.02	26,642
0.124	179.141	48.82	182.83	586.41	0.36	26.02	37,451
0.074	179.029	50.89	310.02	687.55	0.61	26.40	63,504
0.059	179.232	66.00	517.60	1,013.04	1.01	34.85	106,023
0.049	178.698	95.24	772.06	1,824.44	1.51	43.44	158,148
0.032	178.698	97.31	1,744.77	2,837.02	3.41	64.99	357,397
0.259	229.351	30.31	42.74	85.71	0.08	9.27	8,198
0.219	207.401	29.05	100.73	257.65	0.18	20.37	19,322
0.143	206.802	35.07	155.86	380.22	0.29	20.64	29,897
0.114	206.479	47.69	234.96	605.44	0.43	24.95	45,071
0.089	205.960	54.06	355.79	730.51	0.65	29.53	68,248
0.043	206.729	40.61	608.45	786.04	1.11	24.27	116,716
0.039	206.729	62.28	994.72	1,606.44	1.82	35.85	190,811
0.038	206.729	64.46	1,131.59	1,773.96	2.07	40.02	217,066
0.252	242.481	30.91	55.18	95.29	0.09	9.75	9,366
0.224	216.000	26.96	101.27	233.66	0.16	17.84	17,190
0.138	217.558	39.64	202.68	437.67	0.33	21.81	34,403
0.047	218.142	18.30	274.00	390.72	0.44	9.98	46,511
0.050	214.495	27.70	413.69	483.28	0.67	16.48	70,222
0.040	217.241	40.56	959.87	739.68	1.56	29.78	162,931
0.165	204.868	14.71	45.07	65.93	0.07	5.73	7,133
0.195	186.437	25.94	104.37	228.98	0.16	17.31	16,518
0.103	185.320	26.01	173.78	319.00	0.26	15.21	27,503
0.084	185.825	34.38	253.23	478.99	0.38	18.10	40,076
0.073	184.623	47.60	395.18	674.70	0.60	24.78	62,543
0.041	186.113	51.97	711.46	948.75	1.08	24.62	112,598
0.074	185.931	148.78	989.20	2,185.65	1.50	62.72	156,554
0.101	244.369	2.31	11.94	14.56	0.03	0.80	1,955
0.121	170.490	3.88	15.91	25.67	0.03	1.57	2,216
0.108	170.490	5.73	19.38	31.72	0.04	2.04	3,239
0.142	170.490	19.55	52.53	63.50	0.08	5.39	6,479
0.140	170.490	18.41	67.79	125.70	0.13	8.99	10,911
0.368	420.542	6.90	24.15	39.98	0.05	2.95	3,364
0.297	420.542	20.52	52.84	86.48	0.11	6.23	8,831
0.418	420.542	62.56	156.55	158.91	0.20	15.47	15,560
0.411	420.542	67.88	233.71	432.32	0.41	34.49	35,326
0.227	420.542	79.99	339.68	695.18	0.71	34.25	63,502
0.133	420.542	75.82	229.96	937.33	1.03	28.87	91,258
0.123	420.542	116.26	455.13	1,460.28	1.54	45.92	156,442



0.125	420.542	198.01	752.44	2,477.80	2.60	76.98	258,633
0.151	420.542	626.34	2,282.79	7,348.09	6.17	220.68	613,991
0.192	218.702	19.11	42.13	74.67	0.07	6.87	7,803
0.210	197.376	28.30	92.56	245.70	0.16	18.22	17,144
0.099	196.127	24.29	152.24	304.49	0.27	14.20	28,199
0.104	196.886	44.59	226.68	604.64	0.40	22.15	41,986
0.122	200.161	78.00	361.89	978.56	0.64	40.84	67,029
0.115	196.512	121.45	552.23	1,648.07	0.98	59.69	102,285
0.198	234.012	25.11	60.18	105.76	0.11	9.37	11,065
0.160	210.692	21.80	110.37	232.54	0.19	15.41	20,295
0.091	210.039	18.99	148.03	265.81	0.26	11.82	27,219
0.140	211.552	55.65	239.65	665.50	0.42	29.23	44,068
0.071	207.950	53.50	422.83	925.76	0.74	26.56	77,750
0.312	210.233	374.73	714.57	3,737.27	1.25	194.72	131,396
0.328	226.685	48.54	44.10	107.26	0.09	13.64	9,427
0.327	208.417	40.46	79.54	306.30	0.16	26.64	17,005
0.218	207.455	58.05	145.25	577.66	0.30	32.65	31,052
0.155	208.071	60.80	205.34	683.14	0.42	32.62	43,899
0.163	210.342	109.67	348.36	1,237.09	0.71	57.78	74,472
0.105	207.205	123.77	566.13	1,702.84	1.16	61.36	121,029
0.265	209.931	37.35	41.15	94.75	0.08	11.06	8,753
0.246	187.393	31.11	75.89	246.56	0.15	21.20	16,143
0.139	188.982	36.47	133.26	381.97	0.27	20.85	28,347
0.071	188.440	30.15	182.41	440.66	0.37	14.58	38,801
0.075	188.339	48.71	283.05	653.15	0.57	24.06	60,210
0.070	183.057	83.27	516.75	1,093.38	1.05	42.03	109,922
0.066	188.765	120.22	742.59	1,989.89	1.51	55.21	157,961
0.059	187.956	202.82	1,343.95	3,352.50	2.73	89.91	285,882
0.405	279.274	53.64	45.54	114.58	0.10	14.63	10,094
0.242	258.603	29.54	98.39	290.01	0.21	20.43	21,807
0.213	256.161	63.68	192.04	686.97	0.41	35.34	42,565
0.209	250.571	89.21	254.33	1,021.68	0.54	46.92	56,372
0.130	252.609	94.96	434.62	1,241.29	0.92	49.68	96,332
0.100	252.801	106.59	644.36	1,506.38	1.36	56.54	142,820
0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.120	257.796	436.09	2,236.99	6,466.24	4.73	231.31	495,821
0.139	466.006	3.25	17.07	20.38	0.04	0.83	2,796
0.466	443.274	71.70	177.39	169.54	0.21	17.25	16,401
0.456	443.274	72.05	245.97	449.88	0.43	37.38	36,348
0.252	443.274	91.39	383.68	773.96	0.79	39.82	70,037
0.177	535.623	99.59	295.12	1,199.47	1.30	38.16	115,694
0.167	215.536	17.84	59.95	85.55	0.09	7.27	9,369
0.132	193.190	12.36	87.19	140.76	0.13	9.34	13,627
0.103	191.660	28.26	187.53	330.86	0.28	15.83	29,310
0.080	190.347	28.58	244.23	405.91	0.36	16.10	38,171
0.057	187.666	30.62	332.20	472.15	0.50	15.89	51,921
0.034	192.714	21.53	653.51	458.54	0.98	17.91	102,138
0.110	192.714	242.89	1,233.03	3,012.47	1.84	109.65	192,714
0.152	178.051	15.64	30.17	61.93	0.06	5.43	6,350
0.131	157.553	17.17	66.39	167.20	0.13	11.60	13,972
0.095	157.068	26.26	112.67	299.50	0.23	14.30	23,714
0.064	159.426	27.82	163.67	418.43	0.33	13.80	34,446

0.045	157.397	28.91	270.99	493.65	0.54	16.16	57,034
0.033	157.796	33.08	461.15	656.79	0.93	20.46	97,057
0.047	158.224	87.82	612.16	1,531.16	1.23	38.62	128,839
0.050	155.194	125.18	841.35	2,044.40	1.69	56.99	177,076
0.277	265.154	30.37	54.93	94.14	0.09	9.87	9,436
0.293	239.305	33.42	108.00	270.01	0.18	22.71	18,552
0.261	238.803	75.45	221.69	752.02	0.36	41.63	38,082
0.155	237.291	60.04	282.36	729.72	0.46	31.74	48,504
0.113	238.264	59.60	419.57	812.69	0.69	34.16	72,075
0.041	238.264	41.00	1,176.17	1,507.07	1.93	35.12	202,048
0.209	209.296	23.90	37.55	79.53	0.08	8.01	8,017
0.186	196.126	21.33	75.91	194.13	0.15	15.33	16,210
0.104	191.762	25.86	129.26	303.54	0.26	15.03	27,601
0.065	192.132	26.65	183.75	424.06	0.37	13.37	39,237
0.064	193.373	39.97	289.92	618.32	0.59	20.39	61,906
0.056	190.141	59.61	511.68	942.19	1.04	32.31	109,259
0.038	198.256	81.93	809.06	1,737.04	1.65	33.51	172,761
0.067	193.002	268.31	1,812.80	4,518.53	3.70	134.86	387,090
0.253	293.745	26.51	65.01	110.07	0.11	10.06	11,684
0.313	265.186	40.31	121.07	333.44	0.21	25.66	21,760
0.222	260.379	59.12	208.43	632.09	0.36	31.91	37,461
0.157	264.257	67.48	321.14	861.51	0.55	34.27	57,720
0.093	262.733	62.54	524.08	924.48	0.90	33.33	94,194
0.056	263.447	50.61	907.68	992.82	1.56	34.64	163,139
0.290	262.792	500.24	1,257.44	5,598.74	2.16	249.31	226,001
0.224	255.735	5.77	20.20	33.43	0.04	2.46	2,813
0.180	255.735	11.89	30.60	50.08	0.06	3.61	5,115
0.289	255.735	57.12	137.62	124.24	0.15	13.31	11,764
0.282	255.735	37.82	124.40	229.41	0.21	19.75	17,901
0.156	255.735	62.01	249.72	510.47	0.50	27.10	44,498
0.090	255.735	49.82	143.40	580.51	0.61	19.01	53,960
0.083	255.735	62.56	234.65	734.48	0.75	24.55	75,953
0.219	214.862	18.489	18.957	62.215	0.060	6.370	6261.140
0.284	197.770	37.533	52.131	279.890	0.164	24.726	17218.342
0.149	199.046	40.118	95.753	402.978	0.302	23.608	31626.188
0.112	198.786	46.135	127.001	562.642	0.401	23.540	41946.967
0.080	201.372	61.452	227.057	782.348	0.716	29.854	74994.573
0.104	202.001	136.379	401.151	1643.143	1.265	68.509	132496.155
0.082	200.550	166.242	544.793	2474.875	1.718	73.196	179939.468
0.080	202.650	310.296	1082.422	4573.513	3.414	140.709	357512.951

g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.010	179.282	2.49	39.91	41.99	0.08	0.44	8,267
0.013	161.199	2.74	57.61	42.63	0.11	0.95	11,932

0.010	161.168	4.10	101.52	39.59	0.20	1.29	21,028
0.003	161.179	3.41	163.42	16.72	0.32	0.57	33,848
0.003	161.179	8.43	295.70	74.72	0.58	1.05	61,248
0.114	272.784	4.27	20.49	26.51	0.05	1.37	3,273
0.106	272.784	8.99	28.70	52.65	0.08	2.54	6,547
0.140	272.784	20.02	97.00	82.63	0.13	5.18	10,093
0.125	272.784	20.53	141.36	140.18	0.25	9.78	21,277
0.074	272.784	29.73	230.06	207.65	0.45	10.91	40,099
0.039	272.784	33.68	119.76	261.48	0.67	8.40	59,467
0.037	272.784	57.59	202.28	410.01	1.03	14.27	105,022
0.038	272.784	89.34	312.61	649.53	1.63	22.32	162,306
0.051	272.784	132.99	460.77	1,587.62	2.22	41.10	220,409
0.148	297.997	14.78	47.02	91.67	0.11	5.80	11,703
0.080	258.075	10.66	85.36	126.84	0.20	6.56	21,247
0.041	265.947	13.62	158.70	139.69	0.38	6.14	39,502
0.026	259.886	15.56	216.91	188.68	0.52	5.44	53,992
0.022	259.879	22.87	364.56	247.30	0.87	7.82	90,745
0.021	263.690	34.97	648.29	378.50	1.54	12.59	161,368
0.031	262.677	64.23	969.82	1,408.52	2.31	28.26	241,401
0.054	262.792	273.60	2,815.34	5,774.69	6.69	145.25	700,778
0.091	318.248	3.33	17.49	20.88	0.04	0.82	2,864
0.105	318.248	10.12	33.57	62.20	0.10	2.63	7,956
0.118	414.859	9.01	30.75	56.93	0.09	2.13	7,467
0.155	414.859	19.25	109.68	101.08	0.18	5.11	13,690
0.140	414.859	23.78	209.05	187.06	0.39	11.30	33,604
0.084	414.859	39.22	392.55	297.02	0.82	14.64	72,600
0.180	165.308	25.52	33.54	70.05	0.06	7.30	6,716
0.130	149.974	19.63	66.61	163.52	0.13	11.61	13,339
0.086	151.478	23.94	111.86	237.30	0.21	12.69	22,401
0.054	150.953	25.11	163.58	285.29	0.31	11.76	32,757
0.045	150.828	32.49	253.15	374.01	0.48	14.99	50,694
0.033	150.147	41.35	425.27	507.33	0.81	18.96	85,162
0.127	149.743	227.53	701.11	2,481.05	1.34	119.47	140,399
0.017	150.667	56.58	774.95	700.73	1.48	17.93	155,187
0.253	244.973	39.16	56.43	102.86	0.10	10.78	10,414
0.215	226.279	27.86	106.50	223.81	0.19	18.64	19,654
0.117	223.755	31.95	181.31	312.43	0.32	17.45	33,461
0.075	224.670	32.78	246.94	402.91	0.44	15.18	45,573
0.060	225.759	46.07	416.76	529.10	0.73	20.58	76,914
0.049	224.846	65.55	694.59	766.93	1.22	28.14	128,188
0.091	225.958	172.09	1,013.97	2,569.92	1.79	75.27	187,131
0.066	215.490	228.55	1,782.39	3,850.93	3.14	101.17	328,945
0.182	443.274	33.28	182.91	152.58	0.26	8.18	19,947
0.161	443.274	31.38	246.82	215.42	0.44	13.71	37,678
0.097	443.274	49.08	431.36	319.13	0.85	16.67	75,800
0.051	443.274	56.38	219.48	392.96	1.25	12.77	110,818
0.049	443.274	83.90	321.35	535.95	1.66	18.84	169,331
0.049	443.274	132.03	506.17	861.87	2.68	29.71	266,851
0.070	443.274	344.06	1,202.77	3,857.99	5.96	92.93	592,657
0.063	215.954	4.17	14.23	26.37	0.04	1.00	3,455
0.085	222.278	8.47	38.67	55.02	0.08	3.03	7,944
0.071	198.029	9.78	78.84	96.49	0.15	5.77	16,194

0.042	199.821	13.50	142.07	127.07	0.28	6.16	29,182
0.023	199.649	15.49	212.35	169.15	0.42	5.12	43,618
0.020	198.977	20.15	318.37	197.30	0.62	6.50	65,392
0.023	198.375	39.21	558.17	396.66	1.09	13.51	114,649
0.025	198.224	53.47	813.42	1,131.75	1.60	21.11	167,078
0.022	197.811	96.50	1,511.16	1,862.29	2.96	35.02	310,393
0.072	117.014	10.03	27.04	39.94	0.05	3.07	4,963
0.062	105.000	7.95	47.13	68.43	0.08	5.10	8,649
0.036	105.128	10.05	80.94	94.27	0.14	5.10	14,853
0.025	105.400	12.82	119.55	135.62	0.21	5.27	21,939
0.019	105.464	18.17	197.53	168.57	0.35	6.68	36,250
0.004	105.117	14.57	504.07	413.08	0.88	3.53	92,503
0.164	420.542	5.33	28.95	37.22	0.07	1.80	4,626
0.158	420.542	10.21	35.03	64.26	0.10	3.00	7,990
0.167	420.542	18.95	101.58	104.74	0.18	5.52	13,878
0.154	420.542	25.30	212.73	216.44	0.41	12.96	35,326
0.090	420.542	33.90	334.77	309.70	0.72	13.76	64,343
0.049	420.542	37.13	176.12	392.46	1.08	11.20	96,304
0.047	420.542	55.79	272.86	558.77	1.50	17.12	152,657
0.048	420.542	91.40	440.49	923.79	2.48	27.97	246,438
0.066	420.542	225.84	922.42	3,212.34	4.78	75.02	475,212
0.290	223.158	42.15	45.35	93.24	0.08	11.34	8,739
0.254	212.507	37.99	100.34	287.30	0.18	23.13	19,337
0.126	216.447	35.86	166.17	334.40	0.31	18.65	32,023
0.061	215.208	30.76	228.20	390.69	0.42	12.49	43,979
0.049	213.703	40.38	325.10	372.31	0.60	14.45	62,651
0.132	213.737	241.58	882.83	3,023.02	1.62	105.21	170,135
0.085	213.348	410.57	2,206.16	5,459.53	4.06	169.35	425,161
0.152	253.374	17.40	49.09	76.67	0.09	5.71	9,542
0.134	228.763	15.22	87.71	135.77	0.16	9.96	17,049
0.061	228.169	19.53	185.54	198.98	0.34	9.65	36,068
0.038	227.216	21.58	249.95	239.85	0.46	8.02	48,588
0.024	226.555	24.96	389.77	239.71	0.72	8.07	75,768
0.033	227.637	52.65	671.62	511.20	1.25	19.03	130,558
0.027	227.753	68.35	1,171.61	1,043.45	2.17	27.44	227,753
0.044	233.668	200.50	2,075.02	2,873.82	3.85	75.64	403,370
0.126	216.730	9.95	19.12	51.70	0.06	3.68	6,316
0.107	196.671	16.73	51.84	131.74	0.16	9.29	17,123
0.052	198.893	19.68	95.68	159.45	0.30	8.31	31,602
0.037	198.923	23.18	127.09	202.05	0.40	7.87	41,976
0.033	200.790	36.64	226.40	333.77	0.71	12.16	74,778
0.046	200.016	81.88	397.21	766.05	1.25	29.96	131,194
0.048	198.806	108.67	540.05	1,642.55	1.70	42.90	178,374
0.037	202.166	190.47	1,079.83	2,687.25	3.41	66.01	356,658
0.168	242.972	17.72	50.77	79.51	0.09	6.40	9,235
0.147	217.316	18.41	97.44	161.65	0.17	11.98	17,725
0.090	216.288	25.71	181.32	260.47	0.31	13.74	32,982
0.055	218.620	26.74	260.69	324.59	0.45	11.94	47,420
0.040	218.704	34.78	429.07	390.87	0.75	14.23	78,047
0.036	218.025	53.34	716.37	652.06	1.24	21.56	130,308
0.034	215.909	63.10	985.36	1,235.50	1.71	28.41	179,238
0.040	211.523	109.49	1,310.15	1,856.58	2.28	44.64	238,316

0.114	199.186	11.88	34.13	55.44	0.07	4.01	6,992
0.101	177.921	11.67	63.57	101.56	0.12	7.40	13,022
0.046	178.621	14.31	130.06	131.24	0.25	6.88	26,642
0.031	179.141	17.70	182.83	190.58	0.36	6.44	37,451
0.025	179.029	26.33	310.02	249.91	0.61	8.77	63,504
0.021	179.232	36.95	517.60	338.75	1.01	12.57	106,023
0.041	178.698	85.68	772.06	1,468.84	1.51	35.88	158,148
0.006	178.698	42.33	1,744.77	1,558.74	3.41	12.54	357,397
0.174	229.351	18.41	42.74	72.62	0.08	6.21	8,198
0.072	207.401	11.81	100.73	114.31	0.18	6.71	19,322
0.047	206.802	15.07	155.86	135.24	0.29	6.75	29,897
0.046	206.479	26.26	234.96	310.54	0.43	9.94	45,071
0.047	205.960	38.73	355.79	420.44	0.65	15.69	68,248
0.030	206.729	45.76	608.45	462.77	1.11	17.20	116,716
0.008	206.729	33.19	994.72	860.42	1.82	7.54	190,811
0.031	206.729	87.05	1,131.59	1,500.08	2.07	32.48	217,066
0.167	242.164	22.14	55.10	76.44	0.09	6.45	9,354
0.135	216.241	16.25	101.38	146.36	0.16	10.74	17,209
0.059	217.572	18.75	202.69	191.70	0.33	9.32	34,406
0.032	217.600	16.28	273.32	245.95	0.44	6.73	46,395
0.032	214.550	23.44	413.80	290.20	0.67	10.49	70,239
0.022	217.241	37.72	959.87	370.04	1.56	16.24	162,931
0.077	204.616	8.04	45.02	48.86	0.07	2.68	7,124
0.091	186.206	13.08	104.24	118.95	0.16	8.05	16,498
0.045	185.187	13.65	173.65	134.64	0.26	6.73	27,483
0.039	185.744	19.52	253.12	246.61	0.38	8.48	40,059
0.035	184.377	27.10	394.66	327.77	0.60	11.72	62,460
0.023	185.784	42.25	710.20	587.69	1.07	13.62	112,399
0.013	185.931	28.06	989.20	693.20	1.50	11.16	156,554
0.070	244.369	2.28	11.94	14.25	0.03	0.56	1,955
0.066	170.490	2.55	13.87	17.83	0.03	0.86	2,216
0.064	170.490	4.14	14.20	26.05	0.04	1.21	3,239
0.056	170.490	6.36	39.72	46.85	0.08	2.13	6,479
0.053	170.490	6.38	62.38	63.83	0.13	3.36	10,911
0.176	420.542	4.39	21.06	27.25	0.05	1.41	3,364
0.163	420.542	12.13	38.71	71.03	0.11	3.42	8,831
0.177	420.542	23.26	120.11	119.09	0.20	6.55	15,560
0.163	420.542	26.86	216.35	219.74	0.41	13.65	35,326
0.095	420.542	35.77	335.90	310.58	0.71	14.33	63,502
0.051	420.542	37.85	169.78	378.22	1.03	11.07	91,258
0.049	420.542	61.72	283.33	580.54	1.54	18.27	156,442
0.050	420.542	103.26	468.41	983.10	2.60	30.57	258,633
0.068	420.542	307.77	1,208.79	4,201.28	6.17	99.78	613,991
0.123	218.591	12.97	42.11	60.70	0.07	4.40	7,799
0.093	196.968	13.24	92.37	126.50	0.16	8.06	17,109
0.042	196.161	12.15	152.27	132.26	0.27	6.08	28,204
0.033	196.763	17.46	226.54	220.11	0.40	7.13	41,960
0.041	199.240	30.91	360.22	355.35	0.64	13.75	66,721
0.004	196.512	17.15	552.23	137.45	0.98	1.83	102,285
0.127	234.090	19.87	60.20	85.43	0.11	6.01	11,069
0.041	210.647	7.67	110.35	94.96	0.19	3.97	20,291
0.027	210.082	7.79	148.06	97.36	0.26	3.56	27,225

0.015	210.462	9.77	238.42	134.74	0.42	3.07	43,841
0.011	207.435	13.94	421.78	195.69	0.74	4.22	77,558
0.004	210.233	26.85	714.57	334.69	1.25	2.35	131,396
0.147	229.196	21.18	44.58	73.98	0.09	6.12	9,531
0.249	209.495	31.75	79.95	238.43	0.16	20.35	17,093
0.162	207.149	44.98	145.04	425.15	0.30	24.30	31,007
0.126	207.929	54.07	205.20	542.38	0.42	26.56	43,869
0.102	210.103	78.36	347.96	789.48	0.71	36.26	74,387
0.086	207.168	110.31	566.03	1,413.66	1.16	50.37	121,007
0.172	210.310	23.38	41.22	79.26	0.08	7.15	8,769
0.133	186.652	18.12	75.59	146.07	0.15	11.44	16,080
0.070	188.873	21.51	133.18	190.88	0.27	10.51	28,330
0.041	188.191	22.63	182.17	254.86	0.37	8.46	38,750
0.041	187.097	34.99	281.19	348.92	0.57	12.97	59,813
0.039	185.257	62.95	522.96	601.19	1.06	23.34	111,243
0.050	188.361	98.70	741.00	1,590.42	1.51	41.94	157,622
0.032	187.942	125.23	1,343.85	2,260.93	2.73	49.30	285,859
0.456	279.274	62.12	45.54	119.40	0.10	16.49	10,094
0.246	258.528	29.84	98.36	271.60	0.21	20.75	21,801
0.126	255.782	40.07	191.76	390.25	0.41	21.00	42,502
0.108	250.641	50.68	254.40	552.29	0.54	24.23	56,388
0.071	252.344	61.53	434.16	695.85	0.92	27.14	96,231
0.055	252.132	74.78	642.65	851.91	1.36	30.85	142,442
0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.147	257.796	562.94	2,236.99	7,189.87	4.73	283.54	495,821
0.133	466.006	3.25	17.07	20.38	0.04	0.80	2,796
0.161	443.274	22.79	128.38	119.24	0.21	5.95	16,401
0.146	443.274	25.29	224.13	200.48	0.43	11.98	36,348
0.087	443.274	36.78	375.04	284.58	0.79	13.68	70,037
0.056	535.622	46.32	215.92	396.00	1.30	12.05	115,694
0.053	215.454	7.36	59.92	59.13	0.09	2.32	9,366
0.040	192.654	5.12	86.95	65.10	0.13	2.82	13,589
0.026	191.100	9.06	186.98	95.71	0.28	4.03	29,224
0.015	188.159	7.66	241.42	96.54	0.36	2.91	37,732
0.003	187.666	7.75	332.20	60.78	0.50	0.91	51,921
0.039	192.714	35.01	653.51	476.37	0.98	20.54	102,138
0.053	192.714	111.67	1,233.03	1,621.98	1.84	53.22	192,714
0.065	178.876	6.03	30.31	45.58	0.06	2.33	6,380
0.062	158.264	9.23	66.68	96.58	0.13	5.51	14,035
0.053	156.724	14.65	112.43	167.16	0.23	7.94	23,662
0.029	159.135	14.44	163.37	209.92	0.33	6.33	34,383
0.020	157.534	16.64	271.22	200.75	0.55	7.30	57,083
0.022	156.864	27.54	458.43	388.28	0.92	13.79	96,483
0.037	157.450	67.57	609.17	1,246.83	1.22	29.90	128,209
0.028	155.194	68.05	841.35	1,342.05	1.69	31.51	177,076
0.211	265.154	22.80	54.93	82.61	0.09	7.51	9,436
0.164	239.305	19.22	108.00	158.31	0.18	12.72	18,552
0.108	238.803	35.10	221.69	334.80	0.36	17.22	38,082
0.036	237.291	20.19	282.36	231.48	0.46	7.36	48,504
0.108	238.264	62.90	419.57	749.74	0.69	32.61	72,075
0.055	238.264	98.78	1,176.17	1,634.41	1.93	46.38	202,048
0.106	210.603	12.26	37.78	62.08	0.08	4.06	8,067

0.077	193.979	10.55	75.08	101.29	0.15	6.41	16,032
0.045	190.860	13.63	128.65	128.07	0.26	6.45	27,471
0.033	192.079	17.74	183.70	206.04	0.37	6.76	39,226
0.027	191.159	23.92	286.60	245.35	0.58	8.62	61,197
0.043	191.328	59.35	514.87	660.49	1.05	24.85	109,941
0.018	194.567	42.16	794.01	940.96	1.62	15.88	169,546
0.026	193.002	138.92	1,812.80	2,544.23	3.70	52.16	387,090
0.179	293.433	18.93	64.94	93.47	0.11	7.12	11,672
0.208	264.502	26.33	120.76	227.59	0.21	17.04	21,704
0.115	260.387	31.83	208.43	322.47	0.36	16.49	37,462
0.098	263.649	45.03	320.40	527.83	0.55	21.39	57,587
0.053	262.002	43.84	522.63	499.93	0.90	18.96	93,932
0.005	263.126	22.84	906.58	174.27	1.56	2.81	162,941
0.309	262.792	524.11	1,257.44	5,745.87	2.16	265.31	226,001
0.107	255.735	3.67	17.61	22.78	0.04	1.18	2,813
0.099	255.735	7.03	22.42	41.14	0.06	1.98	5,115
0.125	255.735	21.86	105.70	94.15	0.15	5.75	11,764
0.113	255.735	16.11	115.71	116.18	0.21	7.92	17,901
0.066	255.735	30.32	248.27	227.25	0.50	11.55	44,498
0.035	255.735	27.64	105.77	233.98	0.61	7.30	53,960
0.033	255.735	37.50	143.23	292.58	0.75	9.88	75,953
0.126	216.730	9.947	19.121	51.697	0.060	3.684	6315.602
0.107	196.671	16.728	51.841	131.741	0.164	9.291	17122.663
0.052	198.893	19.680	95.679	159.447	0.302	8.311	31601.938
0.037	198.923	23.175	127.088	202.052	0.401	7.872	41975.853
0.033	200.790	36.636	226.400	333.773	0.714	12.161	74777.580
0.046	200.016	81.876	397.208	766.053	1.253	29.963	131193.860
0.048	198.806	108.665	540.054	1642.554	1.703	42.905	178374.210
0.037	202.166	190.467	1079.835	2687.248	3.406	66.010	356658.350

2010

		2010		g/hp/hr	g/hp/hr	g/hp/hr
AvgHP		Equipment	MaxHP	ROG	CO	NOX
0	46	Aerial Lifts	50	0.175	0.866	1.519
50	74		120	0.130	0.778	1.581
120	130		175	0.078	0.778	1.297
175	210		250	0.344	0.778	3.579
250	380		500	0.147	0.778	2.165
0	12	Air Compressors	15	0.534	1.926	3.123
15	24		25	0.601	1.575	2.620
25	37		50	1.387	3.389	2.902
50	78		120	0.577	1.936	3.424
120	147		175	0.384	1.570	3.058
175	218		250	0.249	0.699	2.862
250	385		500	0.224	0.782	2.551
500	595		750	0.228	0.782	2.622
750	808		1000	0.286	1.015	3.338
0	39	Bore/Drill Rigs	50	0.465	1.217	2.724
50	82		120	0.199	1.017	2.433
120	149		175	0.186	1.074	2.402
175	208		250	0.133	1.057	2.312
250	349		500	0.120	1.041	1.964
500	612		750	0.088	1.074	1.525
750	919		1000	0.084	1.055	2.176
1000	2667		9999	0.069	1.056	2.080
0	9	Cement and Mortar Mixers	15	0.397	1.956	2.545
15	25		25	0.627	1.707	2.960
0	18	Concrete/Industrial Saws	25	0.505	1.708	3.220
25	33		50	1.692	4.409	4.215
50	81		120	0.752	2.784	4.813
120	175		175	0.500	2.275	4.265
0	41	Cranes	50	0.706	0.826	1.816
50	89		120	0.412	0.749	3.230
120	148		175	0.253	0.757	2.611
175	217		250	0.209	0.754	2.420
250	336		500	0.160	0.752	2.033
500	567		750	0.079	0.751	1.295
750	938		1000	0.311	0.748	3.330
1000	1030		9999	0.098	0.752	1.844
0	43	Crawler Tractors	50	1.204	1.327	2.808
50	87		120	0.403	1.228	3.330
120	150		175	0.285	1.215	3.069
175	203		250	0.204	1.219	2.773
250	341		500	0.186	1.225	2.559
500	570		750	0.158	1.218	2.281
750	828		1000	0.206	1.222	3.111



1000	1527		9999	0.141	1.168	2.524
0	45	Crushing/Proc. Equipment	50	2.288	5.633	4.733
50	85		120	0.939	3.176	5.536
120	171		175	0.628	2.580	4.934
175	250		250	0.407	1.128	4.618
250	382		500	0.367	1.249	4.094
500	602		750	0.373	1.224	4.250
750	1337		9999	0.469	1.632	5.450
0	16	Dumpers/Tenders	25	0.306	0.953	1.826
0	36	Excavators	50	0.334	1.083	1.983
50	82		120	0.246	0.962	2.330
120	146		175	0.192	0.973	2.226
175	218		250	0.142	0.974	2.210
250	329		500	0.106	0.968	1.675
500	578		750	0.110	0.965	1.730
750	843		1000	0.168	0.968	2.582
1000	1569		9999	0.100	0.963	1.829
0	42	Forklifts	50	0.503	0.638	1.269
50	82		120	0.185	0.572	1.535
120	141		175	0.135	0.573	1.456
175	208		250	0.151	0.574	1.708
250	344		500	0.144	0.575	1.636
500	880		1000	0.327	0.573	3.140
0	11	Generator Sets	15	0.700	2.969	4.695
15	19		25	0.706	2.429	4.040
25	33		50	1.494	3.933	4.190
50	84		120	0.737	2.715	4.834
120	153		175	0.484	2.207	4.313
175	229		250	0.313	0.979	4.043
250	363		500	0.281	1.086	3.679
500	586		750	0.290	1.086	3.779
750	1130		9999	0.395	1.408	4.818
0	39	Graders	50	1.300	1.157	2.659
50	91		120	0.565	1.108	4.283
120	148		175	0.369	1.135	3.674
175	204		250	0.153	1.121	2.342
250	293		500	0.116	1.112	1.556
500	796		1000	0.298	1.109	3.726
1000	1993		9999	0.174	1.107	2.644
0	38	Off-Highway Tractors	50	0.806	1.300	2.543
50	75		120	0.385	1.184	3.221
120	158		175	0.239	1.175	2.698
175	214		250	0.207	1.168	2.860
250	334		500	0.155	1.171	2.253
500	574		750	0.135	1.176	2.068
750	1000		1000	0.473	1.172	5.345
1000	1726		9999	0.346	1.138	4.150
0	29	Off-Highway Trucks	50	0.659	0.650	2.171
50	87		120	0.425	0.599	3.167
120	159		175	0.255	0.603	2.517
175	211		250	0.221	0.602	2.622
250	372		500	0.172	0.610	2.108

500	656		750	0.213	0.612	2.499
750	897		1000	0.185	0.607	2.732
1000	1764		9999	0.182	0.614	2.613
0	38	Other Construction Equipme	50	0.558	1.338	2.307
50	82		120	0.339	1.191	2.957
120	152		175	0.281	1.189	3.036
175	217		250	0.213	1.204	2.890
250	357		500	0.175	1.209	2.404
500	598		750	0.124	1.196	1.966
750	830		1000	0.176	1.201	2.738
1000	1127		9999	0.179	1.163	2.693
0	35	Other General Industrial Equ	50	0.563	0.972	1.943
50	73		120	0.306	0.869	2.516
120	149		175	0.224	0.872	2.399
175	209		250	0.231	0.875	2.750
250	355		500	0.147	0.874	1.942
500	592		750	0.111	0.875	1.634
750	885		1000	0.111	0.872	2.085
1000	2000		9999	0.054	0.872	1.433
0	36	Other Material Handling Equ	50	0.874	1.196	2.419
50	93		120	0.306	1.081	2.712
120	145		175	0.245	1.078	2.621
175	218		250	0.222	1.076	2.790
250	331		500	0.165	1.074	2.190
500	565		750	0.073	1.078	1.315
750	923		1000	0.073	1.078	1.757
1000	1050		9999	0.067	1.078	1.706
0	39	Pavers	50	0.820	1.428	2.480
50	80		120	0.337	1.272	2.916
120	158		175	0.253	1.282	2.770
175	213		250	0.086	1.286	1.820
250	327		500	0.088	1.264	1.483
500	750		750	0.058	1.280	0.991
0	35	Paving Equipment	50	0.431	1.294	1.902
50	89		120	0.292	1.178	2.569
120	148		175	0.179	1.171	2.164
175	216		250	0.152	1.173	2.143
250	339		500	0.140	1.167	1.971
500	605		750	0.089	1.176	1.577
750	842		1000	0.178	1.175	2.612
0	8	Plate Compactors	15	0.286	1.492	1.797
0	13	Pressure Washers	15	0.284	1.204	1.903
15	19		25	0.286	0.985	1.638
25	38		50	0.481	1.348	1.645
50	64		120	0.269	1.049	1.871
0	8	Pumps	15	0.824	2.969	4.815
15	21		25	0.927	2.429	4.040
25	37		50	1.597	4.138	4.234
50	84		120	0.761	2.758	4.907
120	151		175	0.502	2.241	4.379
175	217		250	0.325	0.998	4.105
250	372		500	0.291	1.125	3.722

500	615		750	0.300	1.125	3.823
750	1460		9999	0.403	1.452	4.871
0	36	Rollers	50	0.540	1.181	2.097
50	87		120	0.325	1.066	2.815
120	144		175	0.169	1.059	2.103
175	213		250	0.203	1.063	2.754
250	335		500	0.225	1.078	2.822
500	521		750	0.235	1.061	3.179
0	47	Rough Terrain Forklifts	50	0.535	1.273	2.241
50	96		120	0.215	1.146	2.336
120	130		175	0.133	1.142	1.925
175	208		250	0.268	1.150	3.167
250	374		500	0.137	1.131	2.332
500	625		750	0.603	1.143	5.996
0	42	Rubber Tired Dozers	50	1.194	1.060	2.598
50	82		120	0.502	0.975	3.774
120	150		175	0.390	0.970	3.867
175	211		250	0.292	0.973	3.251
250	354		500	0.307	0.983	3.442
500	584		750	0.216	0.969	2.935
0	42	Rubber Tired Loaders	50	0.893	0.987	2.279
50	86		120	0.360	0.881	2.841
120	150		175	0.246	0.888	2.537
175	206		250	0.151	0.886	2.151
250	320		500	0.158	0.885	2.049
500	600		750	0.145	0.860	1.832
750	837		1000	0.148	0.887	2.402
1000	1521		9999	0.139	0.884	2.228
0	36	Scrapers	50	1.511	1.260	3.185
50	84		120	0.351	1.167	3.422
120	166		175	0.385	1.156	4.128
175	225		250	0.399	1.130	4.548
250	381		500	0.252	1.140	3.259
500	565		750	0.193	1.140	2.670
750	950		1000	0.593	1.138	6.460
1000	1923		9999	0.233	1.163	3.395
0	6	Signal Boards	15	0.542	2.845	3.397
15	37		50	1.829	4.687	4.518
50	82		120	0.827	2.974	5.221
120	158		175	0.548	2.420	4.650
175	216		250	0.430	1.287	5.267
0	43	Skid Steer Loaders	50	0.385	1.378	1.952
50	71		120	0.164	1.236	1.914
120	153		175	0.161	1.226	1.938
175	201		250	0.146	1.217	2.038
250	277		500	0.112	1.201	1.702
500	530		750	0.044	1.233	0.869
750	1000		1000	0.244	1.233	3.020
0	36	Surfacing Equipment	50	0.405	0.847	1.708
50	89		120	0.194	0.748	1.859
120	151		175	0.176	0.746	1.992
175	216		250	0.130	0.758	1.923

250	362		500	0.079	0.747	1.337
500	615		750	0.055	0.750	1.071
750	814		1000	0.109	0.752	1.887
1000	1141		9999	0.111	0.737	1.797
0	36	Sweepers/Scrubbers	50	0.863	1.544	2.654
50	78		120	0.438	1.393	3.503
120	159		175	0.476	1.390	4.733
175	204		250	0.278	1.381	3.405
250	303		500	0.201	1.387	2.698
500	848		1000	0.048	1.387	1.777
0	38	Tractors/Loaders/Backhoes	50	0.614	0.981	2.075
50	83		120	0.257	0.918	2.326
120	144		175	0.181	0.898	2.095
175	204		250	0.132	0.900	2.058
250	320		500	0.127	0.906	1.911
500	575		750	0.107	0.890	1.621
750	871		1000	0.078	0.928	1.691
1000	2006		9999	0.135	0.904	2.196
0	40	Trenchers	50	0.677	1.634	2.778
50	82		120	0.486	1.476	4.020
120	144		175	0.408	1.449	4.347
175	218		250	0.312	1.470	3.952
250	359		500	0.168	1.460	2.439
500	619		750	0.086	1.466	1.611
750	860		1000	0.584	1.462	6.526
0	11	Welders	15	0.501	1.805	2.928
15	20		25	0.563	1.477	2.457
25	46		50	1.180	2.933	2.665
50	70		120	0.512	1.763	3.128
120	174		175	0.339	1.431	2.793
175	211		250	0.221	0.640	2.616
250	297		500	0.198	0.722	2.346
0	29	Water Trucks	50	0.659	0.650	2.171
50	87		120	0.425	0.599	3.167
120	159		175	0.255	0.603	2.517
175	211		250	0.221	0.602	2.622
250	372		500	0.172	0.610	2.108
500	656		750	0.213	0.612	2.499
750	897		1000	0.185	0.607	2.732
1000	1764		9999	0.182	0.614	2.613

2021

AvgHP

0  
50

2021		g/hp/hr	g/hp/hr	g/hp/hr
Equipment	MaxHP	ROG	CO	NOX
Aerial Lifts	50	0.053	0.866	0.901
	74	0.035	0.778	0.537

120	130		175	0.031	0.778	0.274
175	210		250	0.017	0.778	0.080
250	380		500	0.023	0.778	0.197
0	12	Air Compressors	15	0.345	1.696	2.148
15	24		25	0.362	1.176	2.162
25	37		50	0.436	2.417	2.054
50	78		120	0.218	1.763	1.522
120	147		175	0.169	1.532	1.114
175	218		250	0.132	0.532	0.935
250	385		500	0.128	0.511	0.834
500	595		750	0.129	0.511	0.853
750	808		1000	0.140	0.545	1.744
0	39	Bore/Drill Rigs	50	0.374	1.197	2.329
50	82		120	0.114	1.040	1.375
120	149		175	0.081	1.067	0.803
175	208		250	0.070	1.047	0.779
250	349		500	0.062	1.051	0.613
500	612		750	0.051	1.060	0.480
750	919		1000	0.071	1.055	1.536
1000	2667		9999	0.104	1.056	2.168
0	9	Cement and Mortar Mixers	15	0.370	1.943	2.320
15	25		25	0.399	1.333	2.475
0	18	Concrete/Industrial Saws	25	0.500	1.708	3.163
25	33		50	0.528	3.272	2.966
50	81		120	0.270	2.573	2.127
120	175		175	0.209	2.243	1.501
0	41	Cranes	50	0.638	0.825	1.733
50	89		120	0.196	0.749	1.651
120	148		175	0.150	0.756	1.473
175	217		250	0.105	0.754	1.182
250	336		500	0.089	0.753	0.992
500	567		750	0.069	0.750	0.786
750	938		1000	0.245	0.748	2.657
1000	1030		9999	0.058	0.752	0.684
0	43	Crawler Tractors	50	0.926	1.328	2.408
50	87		120	0.302	1.226	2.426
120	150		175	0.195	1.213	1.884
175	203		250	0.154	1.217	1.858
250	341		500	0.127	1.221	1.405
500	570		750	0.107	1.218	1.211
750	828		1000	0.179	1.214	2.744
1000	1527		9999	0.151	1.168	2.529
0	45	Crushing/Proc. Equipment	50	0.673	4.006	3.284
50	85		120	0.342	2.895	2.332
120	171		175	0.269	2.524	1.649
175	250		250	0.214	0.873	1.370
250	382		500	0.209	0.836	1.228
500	602		750	0.209	0.836	1.253
750	1337		9999	0.246	0.886	2.721
0	16	Dumpers/Tenders	25	0.261	0.889	1.647
0	36	Excavators	50	0.225	1.082	1.497
50	82		120	0.110	0.964	1.088

120	146		175	0.087	0.973	0.777
175	218		250	0.065	0.972	0.651
250	329		500	0.057	0.967	0.509
500	578		750	0.066	0.967	0.618
750	843		1000	0.066	0.965	1.351
1000	1569		9999	0.064	0.963	1.195
0	42	Forklifts	50	0.211	0.638	0.909
50	82		120	0.087	0.572	0.755
120	141		175	0.065	0.573	0.587
175	208		250	0.052	0.574	0.519
250	344		500	0.053	0.575	0.463
500	880		1000	0.018	0.573	0.473
0	11	Generator Sets	15	0.470	2.614	3.295
15	19		25	0.528	1.813	3.333
25	33		50	0.466	2.902	2.937
50	84		120	0.248	2.490	2.197
120	153		175	0.185	2.165	1.601
175	229		250	0.139	0.752	1.341
250	363		500	0.133	0.737	1.209
500	586		750	0.134	0.737	1.235
750	1130		9999	0.168	0.787	2.541
0	39	Graders	50	0.956	1.158	2.242
50	91		120	0.385	1.102	2.912
120	148		175	0.216	1.124	1.978
175	204		250	0.143	1.115	1.791
250	293		500	0.138	1.109	1.231
500	796		1000	0.303	1.109	3.798
1000	1993		9999	0.209	1.107	2.751
0	38	Off-Highway Tractors	50	0.413	1.305	1.961
50	75		120	0.180	1.178	1.643
120	158		175	0.118	1.174	1.158
175	214		250	0.091	1.169	0.920
250	334		500	0.067	1.165	0.548
500	574		750	0.083	1.171	0.747
750	1000		1000	0.073	1.172	1.051
1000	1726		9999	0.121	1.203	1.672
0	29	Off-Highway Trucks	50	0.329	0.658	1.709
50	87		120	0.177	0.594	1.410
120	159		175	0.111	0.602	0.858
175	211		250	0.100	0.602	0.805
250	372		500	0.090	0.608	0.746
500	656		750	0.117	0.606	1.019
750	897		1000	0.102	0.603	1.588
1000	1764		9999	0.093	0.612	1.410
0	38	Other Construction Equipme	50	0.439	1.335	2.036
50	82		120	0.209	1.195	1.851
120	152		175	0.143	1.188	1.428
175	217		250	0.113	1.202	1.331
250	357		500	0.094	1.202	1.009
500	598		750	0.084	1.197	0.977
750	830		1000	0.071	1.190	1.399
1000	1127		9999	0.068	1.163	1.339

0	35	Other General Industrial Equ	50	0.297	0.972	1.512
50	73		120	0.144	0.869	1.270
120	149		175	0.091	0.872	0.802
175	209		250	0.073	0.875	0.715
250	355		500	0.070	0.874	0.614
500	592		750	0.059	0.875	0.474
750	885		1000	0.099	0.872	1.666
1000	2000		9999	0.024	0.872	0.787
0	36	Other Material Handling Equ	50	0.458	1.196	1.963
50	93		120	0.122	1.081	1.169
120	145		175	0.103	1.078	0.888
175	218		250	0.111	1.076	1.218
250	331		500	0.105	1.074	1.028
500	565		750	0.085	1.078	0.824
750	923		1000	0.039	1.078	0.940
1000	1050		9999	0.030	1.078	0.916
0	39	Pavers	50	0.525	1.427	1.912
50	80		120	0.182	1.274	1.672
120	158		175	0.111	1.281	1.119
175	213		250	0.072	1.281	1.032
250	327		500	0.071	1.262	0.853
500	750		750	0.052	1.280	0.493
0	35	Paving Equipment	50	0.218	1.294	1.379
50	89		120	0.132	1.176	1.225
120	148		175	0.085	1.170	0.822
175	216		250	0.078	1.174	0.917
250	339		500	0.077	1.165	0.878
500	605		750	0.065	1.176	0.843
750	842		1000	0.035	1.175	0.828
0	8	Plate Compactors	15	0.284	1.492	1.781
0	13	Pressure Washers	15	0.191	1.060	1.336
15	19		25	0.214	0.735	1.351
25	38		50	0.136	1.002	1.145
50	64		120	0.082	0.964	0.853
0	8	Pumps	15	0.532	2.614	3.311
15	21		25	0.558	1.813	3.333
25	37		50	0.510	3.046	2.976
50	84		120	0.264	2.528	2.229
120	151		175	0.198	2.197	1.627
175	217		250	0.149	0.764	1.364
250	372		500	0.143	0.746	1.225
500	615		750	0.145	0.746	1.253
750	1460		9999	0.178	0.797	2.569
0	36	Rollers	50	0.333	1.180	1.632
50	87		120	0.139	1.064	1.347
120	144		175	0.076	1.059	0.794
175	213		250	0.077	1.063	0.935
250	335		500	0.087	1.076	0.972
500	521		750	0.035	1.061	0.265
0	47	Rough Terrain Forklifts	50	0.407	1.272	1.773
50	96		120	0.073	1.146	0.919
120	130		175	0.055	1.143	0.650

175	208		250	0.048	1.145	0.648
250	374		500	0.039	1.128	0.523
500	625		750	0.044	1.143	0.537
0	42	Rubber Tired Dozers	50	0.515	1.072	1.789
50	82		120	0.377	0.981	2.819
120	150		175	0.286	0.969	2.684
175	211		250	0.248	0.973	2.489
250	354		500	0.204	0.981	2.009
500	584		750	0.190	0.969	2.420
0	42	Rubber Tired Loaders	50	0.502	0.988	1.800
50	86		120	0.189	0.879	1.525
120	150		175	0.131	0.888	1.128
175	206		250	0.101	0.885	1.085
250	320		500	0.100	0.882	0.944
500	600		750	0.103	0.871	0.955
750	837		1000	0.111	0.888	1.800
1000	1521		9999	0.085	0.884	1.492
0	36	Scrapers	50	1.517	1.260	3.055
50	84		120	0.355	1.166	3.212
120	166		175	0.218	1.154	2.094
175	225		250	0.197	1.131	2.107
250	381		500	0.151	1.139	1.662
500	565		750	0.126	1.138	1.393
750	950		1000	0.593	1.138	6.460
1000	1923		9999	0.237	1.163	3.219
0	6	Signal Boards	15	0.542	2.845	3.397
15	37		50	0.558	3.417	3.121
50	82		120	0.284	2.725	2.254
120	158		175	0.217	2.374	1.594
175	216		250	0.203	0.993	1.602
0	43	Skid Steer Loaders	50	0.158	1.378	1.317
50	71		120	0.069	1.233	0.872
120	153		175	0.060	1.223	0.613
175	201		250	0.039	1.204	0.485
250	277		500	0.029	1.201	0.219
500	530		750	0.067	1.233	0.900
750	1000		1000	0.117	1.233	1.669
0	36	Surfacing Equipment	50	0.160	0.850	1.263
50	89		120	0.098	0.752	1.044
120	151		175	0.081	0.745	0.934
175	216		250	0.065	0.757	0.903
250	362		500	0.044	0.749	0.528
500	615		750	0.039	0.747	0.482
750	814		1000	0.054	0.748	1.106
1000	1141		9999	0.061	0.737	1.179
0	36	Sweepers/Scrubbers	50	0.581	1.544	2.209
50	78		120	0.210	1.393	1.805
120	159		175	0.183	1.390	1.689
175	204		250	0.078	1.381	0.801
250	303		500	0.210	1.387	2.481
500	848		1000	0.123	1.387	1.942
0	38	Tractors/Loaders/Backhoes	50	0.292	0.985	1.557



50	83		120	0.114	0.909	1.104
120	144		175	0.085	0.894	0.760
175	204		250	0.081	0.900	0.873
250	320		500	0.069	0.897	0.654
500	575		750	0.095	0.892	1.015
750	871		1000	0.051	0.911	1.087
1000	2006		9999	0.070	0.904	1.260
0	40	Trenchers	50	0.425	1.632	2.241
50	82		120	0.292	1.472	2.566
120	144		175	0.214	1.449	2.147
175	218		250	0.187	1.468	2.191
250	359		500	0.116	1.458	1.252
500	619		750	0.035	1.464	0.239
750	860		1000	0.612	1.462	6.697
0	11	Welders	15	0.324	1.590	2.014
15	20		25	0.339	1.102	2.027
25	46		50	0.383	2.128	1.886
50	70		120	0.190	1.612	1.408
120	174		175	0.146	1.401	1.031
175	211		250	0.112	0.487	0.866
250	297		500	0.109	0.470	0.773
0	29	Water Trucks	50	0.329	0.658	1.709
50	87		120	0.177	0.594	1.410
120	159		175	0.111	0.602	0.858
175	211		250	0.100	0.602	0.805
250	372		500	0.090	0.608	0.746
500	656		750	0.117	0.606	1.019
750	897		1000	0.102	0.603	1.588
1000	1764		9999	0.093	0.612	1.410

g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
SOX	PM	CO2	ROG	CO	NOX	SOX	PM
0.002	0.099	179.282	8.08	39.91	70.02	0.08	4.57
0.002	0.101	161.199	9.59	57.61	117.06	0.11	7.51
0.002	0.055	161.168	10.20	101.52	169.28	0.20	7.16
0.002	0.183	161.179	72.21	163.42	751.59	0.32	38.38
0.002	0.068	161.179	55.92	295.70	822.59	0.58	25.74
0.004	0.225	272.784	6.41	23.11	37.48	0.05	2.70
0.003	0.183	272.784	14.42	37.81	62.89	0.08	4.38
0.004	0.318	272.784	51.32	125.41	107.36	0.13	11.77
0.003	0.311	272.784	44.98	150.99	267.08	0.25	24.26
0.003	0.172	272.784	56.45	230.76	449.58	0.45	25.27
0.003	0.094	272.784	54.34	152.37	623.98	0.67	20.51
0.003	0.087	272.784	86.13	301.22	982.03	1.03	33.42
0.003	0.088	272.784	135.49	465.53	1,559.93	1.63	52.42
0.003	0.100	272.784	230.78	820.34	2,697.24	2.22	80.45
0.003	0.204	302.816	18.27	47.78	106.99	0.11	8.02
0.002	0.157	253.080	16.41	83.71	200.35	0.20	12.96
0.003	0.116	267.231	27.63	159.47	356.75	0.38	17.27
0.003	0.070	263.122	27.67	219.61	480.40	0.52	14.47
0.002	0.066	259.191	41.79	363.60	685.67	0.86	22.91
0.003	0.054	267.347	53.83	657.28	933.47	1.56	33.08
0.003	0.050	262.709	77.04	969.93	1,999.42	2.31	45.50
0.003	0.047	262.792	184.57	2,815.34	5,546.83	6.69	126.09
0.005	0.146	318.248	3.58	17.60	22.91	0.04	1.31
0.004	0.194	318.248	15.66	42.67	74.01	0.10	4.85
0.005	0.158	414.859	9.08	30.75	57.96	0.09	2.84
0.005	0.413	414.859	55.82	145.50	139.11	0.18	13.63
0.005	0.403	414.859	60.89	225.52	389.88	0.39	32.62
0.005	0.224	414.859	87.44	398.15	746.32	0.82	39.17
0.002	0.192	165.360	28.69	33.55	73.79	0.06	7.78
0.001	0.240	150.025	36.65	66.64	287.26	0.13	21.37
0.001	0.139	151.589	37.45	111.95	386.11	0.21	20.60
0.001	0.110	150.995	45.42	163.62	525.13	0.31	23.96
0.001	0.084	150.594	53.64	252.76	683.15	0.48	28.24
0.001	0.043	150.469	44.62	426.18	734.76	0.81	24.35
0.001	0.165	149.774	291.86	701.25	3,122.05	1.34	154.43
0.001	0.043	150.667	101.15	774.95	1,898.87	1.48	44.69
0.002	0.337	244.971	51.20	56.43	119.35	0.10	14.31
0.002	0.269	226.605	35.02	106.65	289.26	0.19	23.40
0.002	0.162	224.247	42.61	181.71	459.01	0.32	24.24
0.002	0.107	224.949	41.35	247.25	562.56	0.44	21.69
0.002	0.097	226.034	63.20	417.27	871.77	0.74	33.12
0.002	0.081	224.862	89.88	694.64	1,300.47	1.22	46.12
0.002	0.090	225.573	170.24	1,012.24	2,576.55	1.78	74.64

0.002	0.064	215.490	215.78	1,782.39	3,852.73	3.14	97.83
0.006	0.524	443.274	102.97	253.48	212.99	0.26	23.58
0.005	0.512	443.274	79.83	269.94	470.58	0.44	43.54
0.005	0.283	443.274	107.40	441.23	843.68	0.85	48.44
0.005	0.152	443.274	101.64	281.89	1,154.55	1.25	38.08
0.004	0.141	443.274	140.04	477.25	1,563.76	1.66	53.78
0.004	0.143	443.274	224.58	736.60	2,558.38	2.68	86.12
0.004	0.163	443.274	626.96	2,181.69	7,287.04	5.96	218.28
0.003	0.103	215.954	4.90	15.24	29.21	0.04	1.65
0.002	0.158	222.404	11.93	38.70	70.85	0.08	5.63
0.002	0.179	197.623	20.13	78.68	190.56	0.15	14.66
0.002	0.114	199.929	28.10	142.15	325.13	0.28	16.68
0.002	0.069	200.003	30.96	212.73	482.78	0.42	15.17
0.002	0.055	198.879	34.88	318.21	550.46	0.62	18.01
0.002	0.057	198.169	63.66	557.59	999.83	1.09	32.82
0.002	0.082	198.875	141.76	816.09	2,176.18	1.60	69.35
0.002	0.051	197.811	156.78	1,511.16	2,869.55	2.96	80.35
0.001	0.147	117.014	21.34	27.04	53.80	0.05	6.21
0.001	0.126	105.000	15.22	47.13	126.40	0.08	10.34
0.001	0.078	105.128	19.10	80.94	205.69	0.14	11.03
0.001	0.080	105.400	31.37	119.55	355.44	0.21	16.64
0.001	0.077	105.464	49.50	197.53	562.24	0.35	26.33
0.001	0.175	105.117	288.17	504.07	2,762.92	0.88	154.30
0.007	0.280	420.542	7.70	32.66	51.64	0.07	3.08
0.005	0.252	420.542	13.42	46.15	76.76	0.10	4.79
0.005	0.383	420.542	49.30	129.80	138.27	0.18	12.65
0.005	0.379	420.542	61.90	228.09	406.04	0.41	31.84
0.005	0.210	420.542	74.11	337.68	659.85	0.72	32.12
0.005	0.120	420.542	71.69	224.30	925.77	1.08	27.50
0.004	0.112	420.542	101.83	394.34	1,335.44	1.50	40.82
0.004	0.114	420.542	169.86	636.60	2,214.56	2.48	66.86
0.004	0.141	420.542	446.75	1,591.17	5,444.12	4.78	159.88
0.002	0.348	222.997	50.93	45.31	104.11	0.08	13.63
0.002	0.349	213.437	51.44	100.78	389.78	0.19	31.76
0.002	0.203	218.708	54.53	167.90	543.59	0.31	30.00
0.002	0.074	216.113	31.27	229.16	478.68	0.42	15.16
0.002	0.058	214.208	34.12	325.87	456.25	0.60	16.99
0.002	0.131	213.737	237.08	882.83	2,966.20	1.62	104.50
0.002	0.078	213.348	346.63	2,206.16	5,268.85	4.06	155.75
0.002	0.262	252.645	30.34	48.95	95.77	0.09	9.85
0.002	0.266	230.091	28.66	88.22	240.05	0.16	19.79
0.002	0.140	228.423	37.75	185.75	426.44	0.34	22.19
0.002	0.105	227.022	44.26	249.74	611.69	0.46	22.45
0.002	0.082	227.697	51.96	391.73	753.52	0.73	27.38
0.002	0.071	228.680	77.71	674.69	1,186.21	1.25	40.79
0.002	0.272	227.753	473.17	1,171.61	5,344.58	2.17	271.92
0.002	0.156	221.171	597.87	1,964.04	7,164.02	3.65	269.89
0.002	0.226	214.842	19.20	18.95	63.28	0.06	6.60
0.002	0.280	197.783	37.02	52.13	275.70	0.16	24.37
0.002	0.149	199.014	40.49	95.74	399.99	0.30	23.69
0.002	0.111	198.721	46.59	126.96	553.32	0.40	23.37
0.002	0.081	201.360	64.02	227.04	785.16	0.72	30.33

0.002	0.105	201.980	139.66	401.11	1,639.46	1.27	69.07
0.002	0.081	200.516	165.70	544.70	2,451.21	1.72	72.43
0.002	0.081	202.659	321.74	1,082.47	4,610.02	3.41	143.64
0.002	0.206	243.353	21.22	50.85	87.69	0.09	7.85
0.002	0.228	216.687	27.63	97.16	241.15	0.17	18.58
0.002	0.158	216.255	42.87	181.29	463.02	0.31	24.05
0.002	0.111	218.937	46.20	261.07	626.85	0.45	24.09
0.002	0.091	219.870	62.61	431.35	857.74	0.75	32.43
0.002	0.064	217.530	74.03	714.74	1,175.05	1.24	38.53
0.002	0.082	218.413	145.91	996.79	2,272.73	1.73	68.14
0.002	0.088	211.581	202.22	1,310.51	3,033.73	2.28	98.68
0.002	0.193	199.186	19.76	34.13	68.19	0.07	6.76
0.002	0.209	177.921	22.37	63.57	184.18	0.12	15.28
0.002	0.129	178.621	33.44	130.06	357.79	0.25	19.31
0.002	0.123	179.141	48.32	182.83	574.98	0.36	25.63
0.002	0.075	179.029	52.15	310.02	688.71	0.61	26.60
0.002	0.057	179.232	65.52	517.60	966.60	1.01	33.90
0.002	0.051	178.698	98.11	772.06	1,845.35	1.51	44.83
0.002	0.034	178.698	108.58	1,744.77	2,865.86	3.41	67.42
0.002	0.266	229.351	31.23	42.74	86.47	0.08	9.51
0.002	0.217	207.401	28.51	100.73	252.65	0.18	20.25
0.002	0.144	206.802	35.38	155.86	378.86	0.29	20.83
0.002	0.115	206.479	48.50	234.96	608.98	0.43	25.19
0.002	0.089	205.960	54.67	355.79	725.61	0.65	29.42
0.002	0.041	206.729	41.35	608.45	742.23	1.11	23.29
0.002	0.040	206.729	67.51	994.72	1,621.93	1.82	37.10
0.002	0.039	206.729	70.60	1,131.59	1,790.87	2.07	41.41
0.002	0.257	242.464	31.67	55.17	95.81	0.09	9.93
0.002	0.224	215.897	26.82	101.22	232.05	0.16	17.86
0.002	0.140	217.580	40.07	202.70	438.06	0.33	22.13
0.002	0.046	218.213	18.43	274.09	387.94	0.44	9.83
0.002	0.051	214.495	28.76	413.69	485.42	0.67	16.74
0.002	0.040	217.241	43.44	959.87	743.49	1.56	30.34
0.002	0.167	204.867	14.99	45.07	66.23	0.07	5.82
0.002	0.196	186.442	25.87	104.37	227.65	0.16	17.38
0.002	0.105	185.319	26.57	173.78	321.21	0.26	15.53
0.002	0.079	185.659	32.78	253.00	462.27	0.38	17.12
0.002	0.073	184.619	47.38	395.17	667.74	0.60	24.62
0.002	0.041	186.121	53.72	711.49	954.22	1.08	25.07
0.002	0.075	185.931	150.01	989.20	2,198.97	1.50	63.23
0.004	0.085	244.369	2.29	11.94	14.37	0.03	0.68
0.003	0.113	170.490	3.69	15.65	24.74	0.03	1.47
0.002	0.102	170.490	5.44	18.71	31.12	0.04	1.94
0.002	0.135	170.490	18.27	51.21	62.53	0.08	5.13
0.002	0.134	170.490	17.23	67.16	119.73	0.13	8.61
0.007	0.347	420.542	6.59	23.75	38.52	0.05	2.77
0.005	0.282	420.542	19.46	51.01	84.84	0.11	5.91
0.005	0.400	420.542	59.11	153.12	156.66	0.20	14.81
0.005	0.395	420.542	63.96	231.69	412.22	0.41	33.18
0.005	0.219	420.542	75.73	338.41	661.23	0.71	33.04
0.005	0.125	420.542	70.57	216.53	890.68	1.03	27.09
0.004	0.116	420.542	108.29	418.60	1,384.46	1.54	43.27

0.004	0.118	420.542	184.50	692.04	2,351.22	2.60	72.58
0.004	0.144	420.542	588.13	2,120.16	7,111.41	6.17	209.79
0.002	0.194	218.704	19.28	42.13	74.81	0.07	6.91
0.002	0.210	197.386	28.20	92.57	244.48	0.16	18.26
0.002	0.099	196.102	24.28	152.23	302.39	0.27	14.26
0.002	0.101	196.872	43.36	226.66	587.39	0.40	21.46
0.002	0.117	199.724	75.45	361.10	944.91	0.64	39.32
0.002	0.116	196.512	122.32	552.23	1,654.57	0.98	60.28
0.002	0.199	234.013	25.32	60.18	105.97	0.11	9.40
0.002	0.155	210.645	20.70	110.35	225.01	0.19	14.93
0.002	0.085	210.076	17.25	148.05	249.42	0.26	11.07
0.002	0.141	211.511	55.91	239.61	659.64	0.42	29.38
0.002	0.068	207.951	51.11	422.83	871.74	0.74	25.29
0.002	0.314	210.233	376.63	714.57	3,747.54	1.25	196.06
0.002	0.335	226.646	49.65	44.09	108.04	0.09	13.92
0.002	0.332	208.423	40.95	79.55	307.93	0.16	27.05
0.002	0.219	207.442	58.42	145.24	578.88	0.30	32.84
0.002	0.156	208.073	61.68	205.35	685.84	0.42	32.83
0.002	0.161	210.136	108.75	348.01	1,218.61	0.71	56.87
0.002	0.106	207.203	125.89	566.12	1,714.05	1.16	62.17
0.002	0.266	209.950	37.25	41.15	95.03	0.08	11.07
0.002	0.246	187.406	31.04	75.90	244.76	0.15	21.20
0.002	0.140	188.992	36.84	133.27	380.49	0.27	21.01
0.002	0.072	188.433	31.17	182.40	442.98	0.37	14.80
0.002	0.076	188.265	50.36	282.94	655.01	0.57	24.37
0.002	0.071	182.999	86.85	516.59	1,100.09	1.05	42.79
0.002	0.068	188.758	123.77	742.56	2,010.21	1.51	56.65
0.002	0.061	187.956	210.98	1,343.95	3,388.15	2.73	92.53
0.003	0.411	279.274	54.61	45.54	115.12	0.10	14.84
0.002	0.244	258.725	29.63	98.43	288.60	0.21	20.61
0.002	0.214	256.150	63.97	192.03	685.96	0.41	35.57
0.002	0.209	250.564	89.70	254.32	1,023.23	0.54	47.11
0.002	0.131	252.593	96.27	434.59	1,242.75	0.92	50.01
0.002	0.101	252.769	108.93	644.28	1,508.31	1.36	57.01
0.002	0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14
0.002	0.123	257.796	447.98	2,236.99	6,529.66	4.73	235.91
0.007	0.127	466.006	3.25	17.07	20.38	0.04	0.76
0.006	0.446	443.274	67.66	173.43	167.15	0.21	16.49
0.005	0.438	443.274	67.81	243.83	428.14	0.43	35.90
0.005	0.243	443.274	86.51	382.33	734.64	0.79	38.37
0.006	0.165	535.622	92.86	277.96	1,137.62	1.30	35.73
0.002	0.160	215.432	16.76	59.92	84.86	0.09	6.97
0.002	0.127	193.150	11.54	87.17	135.00	0.13	8.94
0.002	0.095	191.669	24.67	187.54	296.31	0.28	14.46
0.002	0.082	190.280	29.27	244.14	408.71	0.36	16.37
0.002	0.058	187.666	31.00	332.20	470.76	0.50	16.01
0.002	0.034	192.714	23.25	653.51	460.81	0.98	18.25
0.002	0.109	192.714	243.60	1,233.03	3,019.83	1.84	109.45
0.002	0.144	178.281	14.46	30.21	60.93	0.06	5.15
0.002	0.132	157.532	17.19	66.38	164.84	0.13	11.67
0.001	0.096	157.070	26.53	112.67	300.68	0.23	14.47
0.002	0.064	159.435	28.00	163.68	415.41	0.33	13.81

0.002	0.043	157.212	28.68	270.67	484.29	0.54	15.76
0.002	0.034	157.789	34.08	461.13	658.59	0.93	20.69
0.002	0.048	158.226	88.54	612.17	1,536.58	1.23	38.93
0.001	0.050	155.194	126.39	841.35	2,050.69	1.69	57.32
0.003	0.280	265.154	30.72	54.93	94.46	0.09	9.97
0.002	0.299	239.305	33.97	108.00	271.61	0.18	23.21
0.002	0.263	238.803	75.98	221.69	754.85	0.36	42.00
0.002	0.146	237.291	56.78	282.36	696.09	0.46	29.75
0.002	0.114	238.264	60.87	419.57	816.15	0.69	34.50
0.002	0.041	238.264	41.00	1,176.17	1,507.07	1.93	35.12
0.002	0.207	209.425	23.52	37.57	79.50	0.08	7.92
0.002	0.186	196.051	21.22	75.88	192.25	0.15	15.35
0.002	0.105	191.780	26.08	129.27	301.57	0.26	15.14
0.002	0.065	192.106	27.03	183.73	420.36	0.37	13.36
0.002	0.063	193.481	40.61	290.08	611.70	0.59	20.32
0.002	0.056	190.110	61.57	511.59	931.25	1.04	32.41
0.002	0.032	198.189	68.33	808.79	1,473.96	1.65	27.96
0.002	0.067	193.002	270.80	1,812.80	4,403.99	3.70	134.66
0.003	0.256	293.751	26.92	65.01	110.49	0.11	10.17
0.003	0.312	265.197	39.86	121.08	329.84	0.21	25.58
0.002	0.222	260.378	58.67	208.43	625.42	0.36	31.89
0.003	0.158	264.219	68.07	321.10	863.16	0.55	34.41
0.003	0.089	262.430	60.32	523.48	874.41	0.90	31.76
0.003	0.057	263.434	53.34	907.64	997.31	1.56	35.22
0.003	0.292	262.792	502.41	1,257.44	5,612.11	2.16	250.77
0.004	0.211	255.735	5.51	19.86	32.21	0.04	2.32
0.003	0.171	255.735	11.27	29.54	49.13	0.06	3.43
0.003	0.278	255.735	54.27	134.90	122.61	0.15	12.79
0.003	0.272	255.735	35.82	123.43	218.95	0.21	19.06
0.003	0.151	255.735	59.06	248.97	485.98	0.50	26.22
0.003	0.084	255.735	46.63	134.94	552.00	0.61	17.79
0.003	0.078	255.735	58.75	214.34	696.67	0.75	23.11
0.002	0.226	214.842	19.196	18.955	63.276	0.060	6.598
0.002	0.280	197.783	37.020	52.134	275.700	0.164	24.372
0.002	0.149	199.014	40.487	95.737	399.990	0.302	23.694
0.002	0.111	198.721	46.593	126.959	553.322	0.400	23.368
0.002	0.081	201.360	64.016	227.043	785.161	0.716	30.332
0.002	0.105	201.980	139.663	401.110	1639.455	1.265	69.069
0.002	0.081	200.516	165.699	544.701	2451.214	1.718	72.433
0.002	0.081	202.659	321.743	1082.469	4610.023	3.414	143.637

g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
SOX	PM	CO2	ROG	CO	NOX	SOX	PM
0.002	0.008	179.282	2.45	39.91	41.53	0.08	0.38
0.002	0.010	161.199	2.60	57.61	39.78	0.11	0.76

0.002	0.009	161.168	4.04	101.52	35.71	0.20	1.22
0.002	0.003	161.179	3.60	163.42	16.78	0.32	0.57
0.002	0.003	161.179	8.83	295.70	74.98	0.58	1.06
0.004	0.104	272.784	4.14	20.35	25.78	0.05	1.25
0.003	0.098	272.784	8.69	28.22	51.89	0.08	2.35
0.004	0.107	272.784	16.13	89.42	75.99	0.13	3.97
0.003	0.096	272.784	16.98	137.49	118.75	0.25	7.50
0.003	0.058	272.784	24.90	225.16	163.75	0.45	8.56
0.003	0.030	272.784	28.76	115.97	203.82	0.67	6.61
0.003	0.029	272.784	49.41	196.82	321.27	1.03	11.26
0.003	0.030	272.784	76.62	304.18	507.78	1.63	17.62
0.003	0.041	272.784	112.95	440.50	1,408.75	2.22	33.42
0.003	0.146	298.044	14.68	47.03	91.46	0.11	5.74
0.002	0.066	258.849	9.39	85.62	113.22	0.20	5.42
0.003	0.035	265.572	12.04	158.48	119.30	0.38	5.20
0.002	0.024	260.530	14.47	217.45	161.92	0.52	4.91
0.002	0.021	261.545	21.49	366.90	214.19	0.87	7.17
0.003	0.017	263.919	31.41	648.85	293.72	1.54	10.26
0.003	0.031	262.659	65.66	969.75	1,411.99	2.31	28.36
0.003	0.055	262.792	276.35	2,815.34	5,781.74	6.69	145.85
0.005	0.091	318.248	3.33	17.49	20.88	0.04	0.82
0.004	0.101	318.248	9.98	33.33	61.87	0.10	2.52
0.005	0.118	414.859	9.01	30.75	56.93	0.09	2.13
0.005	0.135	414.859	17.42	107.97	97.88	0.18	4.44
0.005	0.121	414.859	21.90	208.38	172.30	0.39	9.84
0.005	0.074	414.859	36.63	392.56	262.60	0.82	12.98
0.002	0.182	165.300	25.90	33.54	70.39	0.06	7.39
0.001	0.115	149.975	17.47	66.61	146.85	0.13	10.21
0.001	0.079	151.462	22.23	111.85	217.82	0.21	11.62
0.001	0.048	150.939	22.87	163.56	256.60	0.31	10.42
0.001	0.040	150.795	29.93	253.10	333.35	0.48	13.41
0.001	0.031	150.187	38.96	425.38	445.68	0.81	17.45
0.001	0.128	149.743	229.28	701.11	2,491.47	1.34	120.12
0.001	0.018	150.667	59.58	774.95	704.47	1.48	18.21
0.002	0.253	245.176	39.38	56.47	102.35	0.10	10.76
0.002	0.200	226.331	26.23	106.52	210.71	0.19	17.35
0.002	0.105	223.948	29.23	181.46	281.81	0.32	15.68
0.002	0.070	224.662	31.19	246.93	376.97	0.44	14.18
0.002	0.055	225.403	43.30	416.10	478.64	0.73	18.84
0.002	0.045	224.743	61.24	694.27	690.56	1.22	25.37
0.002	0.078	224.139	148.42	1,005.81	2,272.47	1.77	64.50
0.002	0.067	215.490	230.16	1,782.39	3,860.84	3.14	101.84
0.006	0.157	443.274	30.29	180.29	147.80	0.26	7.06
0.005	0.139	443.274	29.08	246.10	198.24	0.44	11.84
0.005	0.086	443.274	46.00	431.52	282.06	0.85	14.67
0.005	0.045	443.274	53.54	218.19	342.54	1.25	11.22
0.004	0.043	443.274	79.96	319.47	469.15	1.66	16.58
0.004	0.043	443.274	126.02	503.45	754.20	2.68	26.18
0.004	0.063	443.274	328.44	1,184.89	3,637.48	5.96	84.09
0.003	0.062	215.954	4.17	14.23	26.35	0.04	1.00
0.002	0.077	222.282	8.03	38.68	53.48	0.08	2.75
0.002	0.061	197.918	8.99	78.80	88.97	0.15	5.02

0.002	0.038	199.850	12.63	142.09	113.42	0.28	5.50
0.002	0.020	199.611	14.22	212.31	142.32	0.42	4.36
0.002	0.017	198.690	18.78	317.90	167.15	0.62	5.59
0.002	0.021	198.661	38.18	558.98	357.24	1.10	12.41
0.002	0.025	198.229	55.40	813.45	1,138.42	1.60	21.41
0.002	0.023	197.811	100.77	1,511.16	1,874.89	2.96	35.38
0.001	0.064	117.014	8.94	27.04	38.53	0.05	2.71
0.001	0.054	105.000	7.14	47.13	62.18	0.08	4.41
0.001	0.032	105.128	9.16	80.94	82.94	0.14	4.48
0.001	0.020	105.400	10.90	119.55	108.03	0.21	4.15
0.001	0.019	105.464	18.34	197.53	159.08	0.35	6.48
0.001	0.004	105.117	15.87	504.07	416.54	0.88	3.64
0.007	0.151	420.542	5.18	28.76	36.24	0.07	1.66
0.005	0.147	420.542	10.03	34.44	63.33	0.10	2.79
0.005	0.129	420.542	15.37	95.75	96.93	0.18	4.26
0.005	0.119	420.542	20.86	209.17	184.58	0.41	10.04
0.005	0.071	420.542	28.37	331.22	244.96	0.72	10.87
0.005	0.039	420.542	31.83	172.32	307.05	1.08	8.87
0.004	0.037	420.542	48.23	267.70	438.79	1.50	13.59
0.004	0.038	420.542	78.78	432.16	723.88	2.48	22.20
0.004	0.054	420.542	189.67	888.87	2,871.44	4.78	61.23
0.002	0.258	223.192	37.44	45.35	87.78	0.08	10.10
0.002	0.233	212.386	35.07	100.28	265.00	0.18	21.19
0.002	0.110	216.669	31.98	166.34	292.62	0.31	16.32
0.002	0.057	214.862	29.28	227.84	365.93	0.42	11.59
0.002	0.048	213.666	40.38	325.04	360.96	0.60	14.02
0.002	0.132	213.737	241.58	882.83	3,023.02	1.62	105.21
0.002	0.086	213.348	416.55	2,206.16	5,482.92	4.06	170.65
0.002	0.134	253.656	15.55	49.14	73.86	0.09	5.06
0.002	0.114	228.940	13.41	87.77	122.46	0.16	8.47
0.002	0.056	228.172	18.64	185.54	183.09	0.34	8.85
0.002	0.031	227.245	19.46	249.98	196.82	0.46	6.73
0.002	0.019	226.426	22.26	389.54	183.21	0.72	6.31
0.002	0.027	227.633	47.38	671.60	428.38	1.25	15.75
0.002	0.028	227.753	72.95	1,171.61	1,051.30	2.17	28.03
0.002	0.044	233.833	208.07	2,076.49	2,885.66	3.85	76.51
0.002	0.116	217.312	9.58	19.17	49.79	0.06	3.37
0.002	0.092	196.303	15.43	51.74	122.76	0.16	8.02
0.002	0.043	198.975	17.68	95.72	136.30	0.30	6.86
0.002	0.031	198.934	21.03	127.09	169.93	0.40	6.62
0.002	0.027	200.774	33.48	226.38	277.85	0.71	10.19
0.002	0.041	200.118	76.88	397.41	668.31	1.25	26.66
0.002	0.038	199.299	91.73	541.39	1,424.81	1.71	33.86
0.002	0.031	202.276	164.02	1,080.43	2,487.34	3.41	55.42
0.002	0.158	242.888	16.68	50.75	77.40	0.09	6.02
0.002	0.134	217.343	17.08	97.45	150.97	0.17	10.96
0.002	0.075	216.187	21.85	181.23	217.81	0.31	11.39
0.002	0.049	218.625	24.41	260.70	288.72	0.45	10.52
0.002	0.037	218.694	33.38	429.05	359.96	0.75	13.29
0.002	0.032	217.731	50.16	715.40	584.06	1.24	19.40
0.002	0.031	216.451	58.70	987.84	1,161.20	1.72	25.76
0.002	0.027	211.513	76.45	1,310.09	1,508.42	2.28	30.38



0.002	0.099	199.186	10.44	34.13	53.08	0.07	3.47
0.002	0.087	177.921	10.57	63.57	92.98	0.12	6.40
0.002	0.041	178.621	13.55	130.06	119.64	0.25	6.16
0.002	0.024	179.141	15.23	182.83	149.58	0.36	4.97
0.002	0.022	179.029	24.79	310.02	217.71	0.61	7.78
0.002	0.019	179.232	35.12	517.60	280.30	1.01	10.99
0.002	0.041	178.698	87.40	772.06	1,474.40	1.51	36.18
0.002	0.006	178.698	47.92	1,744.77	1,573.64	3.41	12.98
0.002	0.156	229.351	16.39	42.74	70.18	0.08	5.59
0.002	0.065	207.401	11.33	100.73	108.87	0.18	6.10
0.002	0.045	206.802	14.88	155.86	128.37	0.29	6.50
0.002	0.040	206.479	24.33	234.96	265.93	0.43	8.84
0.002	0.040	205.960	34.84	355.79	340.79	0.65	13.25
0.002	0.031	206.729	47.77	608.45	465.43	1.11	17.52
0.002	0.008	206.729	35.94	994.72	867.78	1.82	7.76
0.002	0.008	206.729	31.48	1,131.59	962.08	2.07	8.08
0.002	0.154	242.304	20.28	55.14	73.84	0.09	5.94
0.002	0.119	216.191	14.52	101.36	133.10	0.16	9.43
0.002	0.054	217.472	17.58	202.60	177.02	0.33	8.55
0.002	0.029	217.435	15.34	273.12	220.04	0.44	6.18
0.002	0.031	214.266	23.33	413.25	279.19	0.67	10.06
0.002	0.022	217.241	39.35	959.87	370.07	1.56	16.38
0.002	0.071	204.724	7.59	45.04	48.00	0.07	2.48
0.002	0.078	186.165	11.69	104.22	108.56	0.16	6.89
0.002	0.041	185.153	12.64	173.62	122.00	0.26	6.02
0.002	0.033	185.744	16.88	253.12	197.74	0.38	7.06
0.002	0.032	184.425	25.99	394.76	297.44	0.60	10.85
0.002	0.019	186.131	39.19	711.53	510.08	1.08	11.61
0.002	0.013	185.931	29.85	989.20	697.02	1.50	11.35
0.004	0.070	244.369	2.28	11.94	14.25	0.03	0.56
0.003	0.061	170.490	2.48	13.78	17.37	0.03	0.80
0.002	0.059	170.490	4.07	13.96	25.67	0.04	1.13
0.002	0.043	170.490	5.15	38.09	43.50	0.08	1.64
0.002	0.041	170.490	5.23	61.70	54.59	0.13	2.60
0.007	0.160	420.542	4.26	20.91	26.49	0.05	1.28
0.005	0.151	420.542	11.72	38.06	70.00	0.11	3.17
0.005	0.137	420.542	18.86	112.70	110.10	0.20	5.06
0.005	0.126	420.542	22.18	212.33	187.22	0.41	10.58
0.005	0.075	420.542	29.96	331.73	245.65	0.71	11.32
0.005	0.040	420.542	32.44	165.77	295.91	1.03	8.76
0.004	0.039	420.542	53.31	277.53	455.88	1.54	14.50
0.004	0.039	420.542	88.97	458.82	770.37	2.60	24.26
0.004	0.056	420.542	259.41	1,162.92	3,751.12	6.17	81.45
0.002	0.110	218.554	11.87	42.10	58.24	0.07	3.93
0.002	0.082	196.985	12.06	92.38	116.96	0.16	7.15
0.002	0.037	196.187	10.89	152.29	114.20	0.27	5.25
0.002	0.030	196.806	16.45	226.59	199.49	0.40	6.48
0.002	0.037	199.242	29.00	360.22	325.34	0.64	12.53
0.002	0.004	196.512	17.96	552.23	138.00	0.98	1.85
0.002	0.122	233.984	19.27	60.17	83.85	0.11	5.77
0.002	0.036	210.703	7.08	110.38	88.50	0.19	3.43
0.002	0.024	210.101	7.10	148.07	84.22	0.26	3.10

0.002	0.015	210.453	10.08	238.41	134.98	0.42	3.09
0.002	0.011	207.423	14.43	421.76	195.69	0.74	4.24
0.002	0.004	210.233	27.80	714.57	335.63	1.25	2.37
0.002	0.147	229.216	21.43	44.59	74.40	0.09	6.10
0.002	0.240	209.773	30.76	80.06	230.04	0.16	19.58
0.002	0.153	207.133	42.80	145.03	401.78	0.30	22.86
0.002	0.121	207.931	52.41	205.21	525.10	0.42	25.48
0.002	0.092	209.765	72.10	347.40	711.12	0.71	32.48
0.002	0.086	207.164	110.74	566.02	1,413.66	1.16	50.38
0.002	0.148	210.252	20.93	41.21	75.04	0.08	6.17
0.002	0.114	186.952	16.24	75.71	131.37	0.15	9.86
0.002	0.062	188.820	19.66	133.15	169.26	0.27	9.26
0.002	0.036	188.212	20.75	182.18	223.32	0.37	7.45
0.002	0.035	187.556	31.99	281.88	301.92	0.57	11.27
0.002	0.037	185.202	61.71	522.81	573.75	1.06	22.24
0.002	0.046	188.891	93.22	743.08	1,506.19	1.51	38.72
0.002	0.033	187.941	129.04	1,343.85	2,269.73	2.73	49.57
0.003	0.403	279.274	54.83	45.54	110.43	0.10	14.58
0.002	0.247	258.511	29.98	98.35	270.88	0.21	20.84
0.002	0.112	255.807	36.23	191.77	347.99	0.41	18.58
0.002	0.091	250.715	44.37	254.48	473.94	0.54	20.53
0.002	0.065	252.499	57.60	434.43	633.72	0.92	24.65
0.002	0.051	252.136	71.43	642.66	786.81	1.36	28.69
0.002	0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14
0.002	0.117	257.796	455.61	2,236.99	6,191.54	4.73	224.50
0.007	0.133	466.006	3.25	17.07	20.38	0.04	0.80
0.006	0.140	443.274	20.66	126.42	115.49	0.21	5.17
0.005	0.127	443.274	23.27	223.43	184.82	0.43	10.43
0.005	0.077	443.274	34.31	375.08	251.88	0.79	12.11
0.006	0.049	535.623	43.88	214.51	346.02	1.30	10.64
0.002	0.047	215.329	6.85	59.89	57.23	0.09	2.02
0.002	0.035	192.682	4.84	86.96	61.49	0.13	2.50
0.002	0.026	191.112	9.18	187.00	93.81	0.28	3.92
0.002	0.015	188.230	7.89	241.51	97.32	0.36	2.94
0.002	0.003	187.666	8.10	332.20	60.49	0.50	0.92
0.002	0.039	192.714	35.65	653.51	477.21	0.98	20.66
0.002	0.055	192.714	116.80	1,233.03	1,668.80	1.84	55.17
0.002	0.061	178.962	5.70	30.33	45.04	0.06	2.19
0.002	0.057	158.355	8.72	66.72	92.54	0.13	5.09
0.001	0.044	156.711	12.29	112.42	141.05	0.23	6.62
0.002	0.028	159.261	14.09	163.50	195.01	0.33	6.01
0.002	0.019	157.573	16.10	271.29	191.50	0.55	6.94
0.002	0.019	157.125	24.28	459.19	296.18	0.92	11.41
0.002	0.023	157.385	43.73	608.92	900.99	1.22	18.95
0.001	0.028	155.194	69.46	841.35	1,345.64	1.69	31.78
0.003	0.188	265.154	20.69	54.93	78.62	0.09	6.67
0.002	0.133	239.305	16.27	108.00	139.94	0.18	10.29
0.002	0.085	238.803	29.26	221.69	269.35	0.36	13.60
0.002	0.025	237.291	16.01	282.36	163.74	0.46	5.12
0.002	0.108	238.264	63.64	419.57	750.44	0.69	32.71
0.002	0.056	238.264	104.56	1,176.17	1,647.15	1.93	47.50
0.002	0.094	210.296	11.17	37.72	59.66	0.08	3.59

0.002	0.065	194.064	9.43	75.12	91.22	0.15	5.38
0.002	0.038	190.866	12.27	128.66	109.38	0.26	5.52
0.002	0.029	192.109	16.49	183.73	178.29	0.37	6.02
0.002	0.024	191.590	22.15	287.24	209.52	0.59	7.55
0.002	0.038	190.428	54.84	512.45	583.19	1.04	22.04
0.002	0.019	194.525	44.75	793.84	947.27	1.62	16.18
0.002	0.026	193.002	141.09	1,812.80	2,527.29	3.70	51.72
0.003	0.157	293.389	16.92	64.93	89.13	0.11	6.26
0.003	0.186	264.591	24.00	120.80	210.53	0.21	15.29
0.002	0.110	260.387	30.76	208.43	308.87	0.36	15.81
0.003	0.086	263.793	40.93	320.58	478.58	0.55	18.86
0.003	0.050	262.038	41.72	522.70	448.78	0.90	18.06
0.003	0.005	263.056	21.44	906.34	147.85	1.56	2.80
0.003	0.310	262.792	526.28	1,257.44	5,759.24	2.16	266.77
0.004	0.097	255.735	3.56	17.49	22.15	0.04	1.07
0.003	0.092	255.735	6.79	22.04	40.54	0.06	1.83
0.003	0.096	255.735	17.61	97.87	86.74	0.15	4.42
0.003	0.087	255.735	13.31	112.87	98.59	0.21	6.11
0.003	0.052	255.735	25.40	243.71	179.38	0.50	9.09
0.003	0.027	255.735	23.66	102.70	182.65	0.61	5.77
0.003	0.026	255.735	32.29	139.67	229.44	0.75	7.82
0.002	0.116	217.312	9.583	19.173	49.789	0.060	3.369
0.002	0.092	196.303	15.433	51.744	122.765	0.163	8.016
0.002	0.043	198.975	17.682	95.719	136.303	0.302	6.863
0.002	0.031	198.934	21.031	127.095	169.933	0.401	6.618
0.002	0.027	200.774	33.476	226.382	277.849	0.714	10.191
0.002	0.041	200.118	76.877	397.411	668.314	1.253	26.664
0.002	0.038	199.299	91.726	541.394	1424.806	1.708	33.857
0.002	0.031	202.276	164.022	1080.427	2487.341	3.408	55.416

2011

(g/hr)  
CO2

AvgHP

8,267	0	46
11,932	50	74
21,028	120	130
33,848	175	210
61,248	250	380
3,273	0	12
6,547	15	24
10,093	25	37
21,277	50	78
40,099	120	147
59,467	175	218
105,022	250	385
162,306	500	595
220,409	750	808
11,893	0	39
20,836	50	82
39,693	120	149
54,665	175	208
90,505	250	349
163,606	500	612
241,429	750	919
700,778	1000	2667
2,864	0	9
7,956	15	25
7,467	0	18
13,690	25	33
33,604	50	81
72,600	120	175
6,718	0	41
13,344	50	89
22,418	120	148
32,766	175	217
50,616	250	336
85,345	500	567
140,429	750	938
155,187	1000	1030
10,414	0	43
19,682	50	87
33,534	120	150
45,630	175	203
77,008	250	341
128,197	500	570
186,812	750	828

2011		g/hp/hr	g/hp/hr	g/hp/hr
Equipment	MaxHP	ROG	CO	NOX
Aerial Lifts	50	0.134	0.866	1.492
	120	0.110	0.778	1.455
	175	0.074	0.778	1.247
	250	0.347	0.778	3.597
	500	0.148	0.778	2.174
Air Compressc	15	0.508	1.891	2.998
	25	0.566	1.516	2.567
	50	1.302	3.302	2.859
	120	0.543	1.919	3.251
	175	0.364	1.565	2.895
	250	0.231	0.655	2.677
	500	0.209	0.713	2.375
	750	0.212	0.713	2.446
	1000	0.268	0.935	3.175
Bore/Drill Rigs	50	0.450	1.217	2.722
	120	0.192	1.017	2.375
	175	0.179	1.073	2.308
	250	0.128	1.054	2.185
	500	0.117	1.033	1.872
	750	0.086	1.074	1.454
	1000	0.089	1.055	2.189
	9999	0.075	1.056	2.096
Cement and M	15	0.384	1.948	2.437
	25	0.577	1.622	2.881
Concrete/Indus	25	0.503	1.708	3.192
	50	1.566	4.275	4.147
	120	0.699	2.757	4.544
	175	0.468	2.266	4.012
Cranes	50	0.676	0.826	1.794
	120	0.400	0.749	3.145
	175	0.251	0.757	2.583
	250	0.207	0.754	2.391
	500	0.156	0.752	1.974
	750	0.080	0.751	1.291
	1000	0.312	0.748	3.334
	9999	0.099	0.752	1.856
Crawler Tracto	50	1.165	1.327	2.782
	120	0.398	1.228	3.284
	175	0.284	1.215	3.042
	250	0.204	1.219	2.754
	500	0.187	1.225	2.536
	750	0.157	1.219	2.245
	1000	0.208	1.222	3.131

328,945  
19,947  
37,678  
75,800  
110,818  
169,331  
266,851  
592,657  
3,455  
7,948  
16,161  
29,198  
43,695  
65,360  
114,530  
167,626  
310,393  
4,963  
8,649  
14,853  
21,939  
36,250  
92,503  
4,626  
7,990  
13,878  
35,326  
64,343  
96,304  
152,657  
246,438  
475,212  
8,733  
19,422  
32,357  
44,163  
62,799  
170,135  
425,161  
9,515  
17,148  
36,108  
48,547  
76,150  
131,156  
227,753  
381,796  
6,261  
17,219  
31,621  
41,933  
74,990

1000  
0  
50  
120  
175  
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750  
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50  
120  
175  
250  
500  
750  
1000  
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50  
120  
175  
250

1527		9999	0.144	1.168	2.541
45	Crushing/Proc	50	2.126	5.458	4.659
85		120	0.879	3.144	5.232
171		175	0.593	2.570	4.647
250		250	0.377	1.058	4.292
382		500	0.343	1.140	3.790
602		750	0.348	1.120	3.942
1337		9999	0.441	1.501	5.155
16	Dumpers/Tend	25	0.293	0.933	1.781
36	Excavators	50	0.336	1.083	1.993
82		120	0.227	0.962	2.177
146		175	0.179	0.973	2.081
218		250	0.134	0.973	2.069
329		500	0.102	0.969	1.571
578		750	0.110	0.965	1.688
843		1000	0.171	0.968	2.595
1569		9999	0.099	0.963	1.716
42	Forklifts	50	0.490	0.638	1.260
82		120	0.181	0.572	1.499
141		175	0.134	0.573	1.435
208		250	0.145	0.574	1.643
344		500	0.139	0.575	1.576
880		1000	0.327	0.573	3.140
11	Generator Set	15	0.668	2.916	4.515
19		25	0.677	2.337	3.957
33		50	1.393	3.828	4.123
84		120	0.688	2.690	4.588
153		175	0.455	2.199	4.081
229		250	0.287	0.919	3.777
363		500	0.257	0.999	3.423
586		750	0.266	0.999	3.522
1130		9999	0.368	1.304	4.576
39	Graders	50	1.314	1.157	2.668
91		120	0.559	1.108	4.230
148		175	0.367	1.135	3.643
204		250	0.157	1.121	2.349
293		500	0.123	1.112	1.561
796		1000	0.300	1.109	3.753
1993		9999	0.177	1.107	2.651
38	Off-Highway T	50	0.796	1.299	2.540
75		120	0.367	1.184	3.102
158		175	0.225	1.175	2.561
214		250	0.200	1.168	2.774
334		500	0.150	1.171	2.154
574		750	0.140	1.176	2.081
1000		1000	0.473	1.172	5.345
1726		9999	0.349	1.138	4.176
29	Off-Highway T	50	0.651	0.650	2.185
87		120	0.380	0.598	2.914
159		175	0.237	0.603	2.344
211		250	0.215	0.601	2.497
372		500	0.173	0.609	2.062

132,482	500	656		750	0.216	0.611	2.488
179,909	750	897		1000	0.185	0.606	2.710
357,528	1000	1764		9999	0.184	0.614	2.563
9,249	0	38	Other Construc	50	0.560	1.338	2.313
17,673	50	82		120	0.332	1.190	2.901
32,977	120	152		175	0.265	1.189	2.875
47,488	175	217		250	0.206	1.203	2.803
78,463	250	357		500	0.164	1.210	2.255
130,012	500	598		750	0.123	1.196	1.924
181,316	750	830		1000	0.124	1.193	2.195
238,381	1000	1127		9999	0.183	1.164	2.715
6,992	0	35	Other General	50	0.559	0.972	1.946
13,022	50	73		120	0.302	0.869	2.477
26,642	120	149		175	0.207	0.872	2.230
37,451	175	209		250	0.204	0.875	2.494
63,504	250	355		500	0.140	0.874	1.855
106,023	500	592		750	0.112	0.875	1.616
158,148	750	885		1000	0.114	0.872	2.109
357,397	1000	2000		9999	0.060	0.872	1.447
8,198	0	36	Other Material	50	0.820	1.196	2.382
19,322	50	93		120	0.290	1.081	2.588
29,897	120	145		175	0.242	1.078	2.564
45,071	175	218		250	0.221	1.076	2.763
68,248	250	331		500	0.165	1.074	2.147
116,716	500	565		750	0.078	1.078	1.327
190,811	750	923		1000	0.079	1.078	1.774
217,066	1000	1050		9999	0.073	1.078	1.722
9,365	0	39	Pavers	50	0.824	1.428	2.482
17,182	50	80		120	0.322	1.271	2.785
34,407	120	158		175	0.246	1.282	2.680
46,526	175	213		250	0.089	1.286	1.823
70,222	250	327		500	0.091	1.264	1.489
162,931	500	750		750	0.062	1.280	0.996
7,133	0	35	Paving Equipm	50	0.431	1.294	1.907
16,519	50	89		120	0.280	1.177	2.484
27,503	120	148		175	0.176	1.171	2.122
40,041	175	216		250	0.146	1.173	2.052
62,541	250	339		500	0.125	1.168	1.798
112,603	500	605		750	0.090	1.176	1.555
156,554	750	842		1000	0.180	1.175	2.627
1,955	0	8	Plate Compact	15	0.285	1.492	1.785
2,216	0	13	Pressure Wash	15	0.271	1.182	1.830
3,239	15	19		25	0.274	0.947	1.604
6,479	25	38		50	0.445	1.309	1.618
10,911	50	64		120	0.250	1.039	1.775
3,364	0	8	Pumps	15	0.783	2.916	4.622
8,831	15	21		25	0.873	2.337	3.957
15,560	25	37		50	1.493	4.029	4.168
35,326	50	84		120	0.712	2.733	4.658
63,502	120	151		175	0.472	2.233	4.145
91,258	175	217		250	0.299	0.936	3.835
156,442	250	372		500	0.267	1.031	3.464

258,633  
 613,991  
 7,803  
 17,145  
 28,195  
 41,983  
 66,883  
 102,285  
 11,065  
 20,291  
 27,224  
 44,059  
 77,751  
 131,396  
 9,425  
 17,005  
 31,050  
 43,899  
 74,399  
 121,027  
 8,754  
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 1000  
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	750	0.276	1.031	3.563
	9999	0.376	1.342	4.628
Rollers	50	0.528	1.181	2.088
	120	0.305	1.065	2.677
	175	0.165	1.059	2.044
	250	0.184	1.063	2.510
	500	0.197	1.072	2.493
	750	0.237	1.061	3.191
Rough Terrain	50	0.511	1.273	2.220
	120	0.194	1.145	2.186
	175	0.120	1.142	1.791
	250	0.243	1.149	2.878
	500	0.138	1.131	2.338
	750	0.606	1.143	6.013
Rubber Tired L	50	1.214	1.060	2.614
	120	0.496	0.975	3.739
	175	0.392	0.970	3.874
	250	0.296	0.973	3.261
	500	0.305	0.983	3.401
	750	0.219	0.969	2.950
Rubber Tired L	50	0.853	0.988	2.260
	120	0.354	0.881	2.782
	175	0.241	0.888	2.465
	250	0.153	0.886	2.126
	500	0.159	0.884	2.021
	750	0.150	0.860	1.843
	1000	0.152	0.887	2.422
	9999	0.144	0.884	2.250
Scrapers	50	1.537	1.260	3.200
	120	0.353	1.167	3.410
	175	0.385	1.156	4.109
	250	0.396	1.131	4.509
	500	0.250	1.140	3.206
	750	0.195	1.140	2.647
	1000	0.593	1.138	6.460
	9999	0.239	1.163	3.428
Signal Boards	15	0.542	2.845	3.397
	50	1.701	4.552	4.445
	120	0.771	2.944	4.937
	175	0.514	2.410	4.383
	250	0.395	1.207	4.895
Skid Steer Log	50	0.342	1.378	1.922
	120	0.149	1.235	1.800
	175	0.148	1.225	1.827
	250	0.149	1.217	2.053
	500	0.113	1.201	1.694
	750	0.047	1.233	0.873
	1000	0.244	1.233	3.026
Surfacing Equi	50	0.391	0.845	1.694
	120	0.188	0.749	1.805
	175	0.172	0.746	1.949
	250	0.128	0.758	1.895

56,967 250  
 97,052 500  
 128,841 750  
 177,076 1000  
 9,436 0  
 18,552 50  
 38,082 120  
 48,504 175  
 72,075 250  
 202,048 500  
 8,022 0  
 16,204 50  
 27,604 120  
 39,232 175  
 61,941 250  
 109,240 500  
 172,702 750  
 387,090 1000  
 11,685 0  
 21,761 50  
 37,461 120  
 57,711 175  
 94,086 250  
 163,132 500  
 226,001 750  
 2,813 0  
 5,115 15  
 11,764 25  
 17,901 50  
 44,498 120  
 53,960 175  
 75,953 250  
 6260.565 0  
 17219.487 50  
 31621.047 120  
 41933.244 175  
 74990.029 250  
 132482.368 500  
 179909.011 750  
 357528.463 1000

362	500	0.077	0.745	1.287
615	750	0.057	0.750	1.074
814	1000	0.110	0.752	1.893
1141	9999	0.112	0.737	1.803
36	50	0.843	1.544	2.644
78	120	0.429	1.393	3.417
159	175	0.454	1.390	4.523
204	250	0.250	1.381	3.194
303	500	0.205	1.387	2.709
848	1000	0.055	1.387	1.792
38	50	0.580	0.982	2.058
83	120	0.248	0.916	2.259
144	175	0.176	0.899	2.026
204	250	0.130	0.900	1.986
320	500	0.124	0.906	1.838
575	750	0.109	0.890	1.606
871	1000	0.069	0.912	1.583
2006	9999	0.134	0.904	2.172
40	50	0.672	1.635	2.775
82	120	0.462	1.475	3.857
144	175	0.405	1.449	4.303
218	250	0.290	1.470	3.725
359	500	0.165	1.461	2.344
619	750	0.080	1.469	1.344
860	1000	0.587	1.462	6.541
11	15	0.476	1.773	2.811
20	25	0.531	1.421	2.406
46	50	1.108	2.859	2.626
70	120	0.481	1.748	2.971
174	175	0.321	1.426	2.645
211	250	0.204	0.599	2.447
297	500	0.184	0.658	2.184
29	50	0.651	0.650	2.185
87	120	0.380	0.598	2.914
159	175	0.237	0.603	2.344
211	250	0.215	0.601	2.497
372	500	0.173	0.609	2.062
656	750	0.216	0.611	2.488
897	1000	0.185	0.606	2.710
1764	9999	0.184	0.614	2.563

**2022**

(g/hr)  
**CO2**  
 8,267  
 11,932

AvgHP

2022		g/hp/hr	g/hp/hr	g/hp/hr
Equipment	MaxHP	ROG	CO	NOX
Aerial Lifts	50	0.052	0.866	0.896
	120	0.034	0.778	0.501

46  
 74



21,028  
 33,848  
 61,248  
 3,273  
 6,547  
 10,093  
 21,277  
 40,099  
 59,467  
 105,022  
 162,306  
 220,409  
 11,705  
 21,311  
 39,447  
 54,126  
 91,327  
 161,508  
 241,383  
 700,778  
 2,864  
 7,956  
 7,467  
 13,690  
 33,604  
 72,600  
 6,716  
 13,340  
 22,399  
 32,754  
 50,683  
 85,184  
 140,399  
 155,187  
 10,422  
 19,658  
 33,490  
 45,572  
 76,793  
 128,129  
 185,624  
 328,945  
 19,947  
 37,678  
 75,800  
 110,818  
 169,331  
 266,851  
 592,657  
 3,455  
 7,944  
 16,185

120  
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130		175	0.029	0.778	0.221
210		250	0.018	0.778	0.080
380		500	0.024	0.778	0.198
12	Air Compressc	15	0.341	1.690	2.122
24		25	0.356	1.166	2.150
37		50	0.402	2.390	1.995
78		120	0.204	1.760	1.409
147		175	0.160	1.533	0.992
218		250	0.126	0.529	0.819
385		500	0.123	0.509	0.744
595		750	0.123	0.509	0.760
808		1000	0.133	0.538	1.654
39	Bore/Drill Rigs	50	0.332	1.185	2.153
82		120	0.101	1.034	1.218
149		175	0.072	1.068	0.647
208		250	0.060	1.048	0.584
349		500	0.057	1.045	0.520
612		750	0.048	1.067	0.388
919		1000	0.030	1.058	1.145
2667		9999	0.105	1.056	2.171
9	Cement and M	15	0.370	1.943	2.320
25		25	0.395	1.326	2.464
18	Concrete/Indus	25	0.500	1.708	3.163
33		50	0.482	3.229	2.874
81		120	0.251	2.566	1.961
175		175	0.196	2.243	1.319
41	Cranes	50	0.612	0.825	1.700
89		120	0.174	0.749	1.483
148		175	0.138	0.756	1.330
217		250	0.095	0.754	1.020
336		500	0.079	0.753	0.834
567		750	0.060	0.750	0.648
938		1000	0.214	0.748	2.392
1030		9999	0.061	0.752	0.688
43	Crawler Tractc	50	0.852	1.329	2.307
87		120	0.269	1.225	2.187
150		175	0.175	1.214	1.641
203		250	0.137	1.215	1.602
341		500	0.114	1.221	1.177
570		750	0.089	1.217	0.911
828		1000	0.160	1.212	2.540
1527		9999	0.152	1.168	2.534
45	Crushing/Proc	50	0.621	3.964	3.184
85		120	0.320	2.890	2.152
171		175	0.252	2.525	1.452
250		250	0.203	0.869	1.187
382		500	0.199	0.833	1.084
602		750	0.200	0.833	1.105
1337		9999	0.235	0.875	2.582
16	Dumpers/Tenc	25	0.261	0.889	1.646
36	Excavators	50	0.191	1.082	1.413
82		120	0.101	0.963	0.995

29,186  
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	175	0.076	0.973	0.641
	250	0.059	0.972	0.529
	500	0.051	0.968	0.397
	750	0.060	0.967	0.491
	1000	0.068	0.965	1.358
	9999	0.032	0.963	0.875
Forklifts	50	0.181	0.638	0.867
	120	0.076	0.572	0.675
	175	0.057	0.573	0.498
	250	0.050	0.574	0.466
	500	0.049	0.575	0.400
	1000	0.020	0.573	0.477
Generator Set	15	0.465	2.606	3.258
	25	0.524	1.797	3.314
	50	0.428	2.870	2.852
	120	0.230	2.485	2.039
	175	0.173	2.166	1.428
	250	0.132	0.748	1.178
	500	0.127	0.733	1.079
	750	0.128	0.733	1.101
	9999	0.158	0.775	2.416
Graders	50	0.901	1.158	2.179
	120	0.341	1.103	2.599
	175	0.188	1.124	1.686
	250	0.131	1.114	1.589
	500	0.133	1.109	1.145
	1000	0.042	1.109	0.977
	9999	0.212	1.107	2.762
Off-Highway T	50	0.354	1.303	1.863
	120	0.159	1.179	1.481
	175	0.105	1.173	0.975
	250	0.082	1.169	0.754
	500	0.060	1.165	0.435
	750	0.078	1.171	0.624
	1000	0.077	1.172	1.059
	9999	0.125	1.204	1.678
Off-Highway T	50	0.313	0.658	1.640
	120	0.163	0.596	1.291
	175	0.096	0.602	0.692
	250	0.086	0.602	0.618
	500	0.078	0.608	0.569
	750	0.105	0.607	0.866
	1000	0.093	0.605	1.467
	9999	0.077	0.613	1.275
Other Construc	50	0.400	1.339	1.969
	120	0.191	1.195	1.702
	175	0.128	1.188	1.244
	250	0.096	1.203	1.056
	500	0.082	1.204	0.821
	750	0.078	1.198	0.845
	1000	0.046	1.200	1.088
	9999	0.070	1.163	1.345

6,992 0  
 13,022 50  
 26,642 120  
 37,451 175  
 63,504 250  
 106,023 500  
 158,148 750  
 357,397 1000  
 8,198 0  
 19,322 50  
 29,897 120  
 45,071 175  
 68,248 250  
 116,716 500  
 190,811 750  
 217,066 1000  
 9,359 0  
 17,205 50  
 34,390 120  
 46,360 175  
 70,147 250  
 162,931 500  
 7,128 0  
 16,494 50  
 27,478 120  
 40,059 175  
 62,476 250  
 112,609 500  
 156,554 750  
 1,955 0  
 2,216 0  
 3,239 15  
 6,479 25  
 10,911 50  
 3,364 0  
 8,831 15  
 15,560 25  
 35,326 50  
 63,502 120  
 91,258 175  
 156,442 250  
 258,633 500  
 613,991 750  
 7,798 0  
 17,111 50  
 28,208 120  
 41,969 175  
 66,721 250  
 102,285 500  
 11,064 0  
 20,297 50  
 27,227 120

35	Other General	50	0.251	0.972	1.434
73		120	0.121	0.869	1.093
149		175	0.087	0.872	0.735
209		250	0.067	0.875	0.601
355		500	0.063	0.874	0.490
592		750	0.053	0.875	0.363
885		1000	0.067	0.872	1.347
2000		9999	0.027	0.872	0.794
36	Other Material	50	0.456	1.196	1.945
93		120	0.102	1.081	1.015
145		175	0.093	1.078	0.749
218		250	0.095	1.076	0.959
331		500	0.094	1.074	0.815
565		750	0.078	1.078	0.619
923		1000	0.042	1.078	0.948
1050		9999	0.031	1.078	0.920
39	Pavers	50	0.475	1.429	1.836
80		120	0.162	1.275	1.520
158		175	0.093	1.282	0.905
213		250	0.061	1.281	0.789
327		500	0.065	1.263	0.752
750		750	0.023	1.280	0.108
35	Paving Equipn	50	0.212	1.294	1.362
89		120	0.110	1.177	1.065
148		175	0.079	1.170	0.736
216		250	0.073	1.174	0.791
339		500	0.066	1.166	0.664
605		750	0.055	1.176	0.626
842		1000	0.038	1.175	0.832
8	Plate Compact	15	0.284	1.492	1.781
13	Pressure Wash	15	0.188	1.056	1.321
19		25	0.212	0.729	1.343
38		50	0.124	0.992	1.111
64		120	0.075	0.962	0.792
8	Pumps	15	0.525	2.606	3.272
21		25	0.549	1.797	3.314
37		50	0.469	3.013	2.889
84		120	0.246	2.523	2.068
151		175	0.186	2.199	1.451
217		250	0.142	0.760	1.198
372		500	0.137	0.742	1.094
615		750	0.138	0.742	1.117
1460		9999	0.168	0.785	2.442
36	Rollers	50	0.290	1.180	1.549
87		120	0.122	1.064	1.208
144		175	0.065	1.059	0.643
213		250	0.073	1.063	0.830
335		500	0.086	1.075	0.924
521		750	0.036	1.061	0.266
47	Rough Terrain	50	0.332	1.272	1.625
96		120	0.067	1.146	0.844
130		175	0.050	1.142	0.565

43,839	175	208		250	0.050	1.144	0.650
77,553	250	374		500	0.029	1.130	0.224
131,396	500	625		750	0.046	1.143	0.538
9,532	0	42	Rubber Tired L	50	0.521	1.072	1.799
17,115	50	82		120	0.320	0.979	2.450
31,004	120	150		175	0.248	0.971	2.296
43,869	175	211		250	0.199	0.972	1.995
74,268	250	354		500	0.196	0.982	1.901
121,004	500	584		750	0.190	0.969	2.420
8,767	0	42	Rubber Tired L	50	0.446	0.989	1.718
16,105	50	86		120	0.167	0.879	1.363
28,322	120	150		175	0.112	0.887	0.911
38,754	175	206		250	0.086	0.885	0.849
59,960	250	320		500	0.090	0.882	0.787
111,210	500	600		750	0.088	0.874	0.759
158,066	750	837		1000	0.073	0.891	1.308
285,859	1000	1521		9999	0.087	0.884	1.498
10,094	0	36	Scrapers	50	1.533	1.260	3.066
21,799	50	84		120	0.344	1.166	3.114
42,506	120	166		175	0.197	1.154	1.849
56,404	175	225		250	0.172	1.131	1.770
96,290	250	381		500	0.133	1.141	1.389
142,445	500	565		750	0.113	1.136	1.194
239,666	750	950		1000	0.593	1.138	6.460
495,821	1000	1923		9999	0.163	1.163	2.498
2,796	0	6	Signal Boards	15	0.542	2.845	3.397
16,401	15	37		50	0.512	3.375	3.027
36,348	50	82		120	0.264	2.718	2.082
70,037	120	158		175	0.203	2.374	1.405
115,695	175	216		250	0.193	0.988	1.391
9,360	0	43	Skid Steer Loa	50	0.141	1.377	1.265
13,591	50	71		120	0.063	1.234	0.807
29,226	120	153		175	0.060	1.223	0.576
37,746	175	201		250	0.041	1.205	0.490
51,921	250	277		500	0.030	1.201	0.217
102,138	500	530		750	0.068	1.233	0.902
192,714	750	1000		1000	0.122	1.233	1.721
6,383	0	36	Surfacing Equi	50	0.135	0.850	1.179
14,043	50	89		120	0.092	0.752	0.980
23,660	120	151		175	0.075	0.745	0.814
34,410	175	216		250	0.062	0.757	0.804
57,097	250	362		500	0.042	0.747	0.470
96,644	500	615		750	0.036	0.747	0.409
128,157	750	814		1000	0.046	0.748	0.989
177,076	1000	1141		9999	0.025	0.737	0.673
9,436	0	36	Sweepers/Scrn	50	0.481	1.544	2.046
18,552	50	78		120	0.178	1.393	1.582
38,082	120	159		175	0.153	1.390	1.368
48,504	175	204		250	0.073	1.381	0.731
72,075	250	303		500	0.213	1.387	2.483
202,048	500	848		1000	0.024	1.387	1.028
8,055	0	38	Tractors/Load	50	0.265	0.984	1.485

16,040	50
27,472	120
39,232	175
61,336	250
109,424	500
169,509	750
387,090	1000
11,670	0
21,711	50
37,462	120
57,618	175
93,945	250
162,897	500
226,001	750
2,813	0
5,115	15
11,764	25
17,901	50
44,498	120
53,960	175
75,953	250
6332.546	0
17090.629	50
31614.923	120
41978.141	175
74771.790	250
131260.782	500
178816.827	750
356854.035	1000

83		120	0.100	0.910	0.975
144		175	0.077	0.894	0.646
204		250	0.072	0.899	0.716
320		500	0.062	0.897	0.530
575		750	0.090	0.892	0.904
871		1000	0.048	0.911	1.079
2006		9999	0.064	0.904	1.180
40	Trenchers	50	0.380	1.632	2.145
82		120	0.278	1.472	2.469
144		175	0.208	1.449	2.062
218		250	0.176	1.468	1.936
359		500	0.111	1.458	1.112
619		750	0.030	1.469	0.151
860		1000	0.614	1.462	6.712
11	Welders	15	0.319	1.585	1.990
20		25	0.334	1.093	2.015
46		50	0.352	2.102	1.831
70		120	0.178	1.609	1.304
174		175	0.137	1.402	0.918
211		250	0.107	0.484	0.759
297		500	0.104	0.468	0.689
29	Water Trucks	50	0.313	0.658	1.640
87		120	0.163	0.596	1.291
159		175	0.096	0.602	0.692
211		250	0.086	0.602	0.618
372		500	0.078	0.608	0.569
656		750	0.105	0.607	0.866
897		1000	0.093	0.605	1.467
1764		9999	0.077	0.613	1.275

g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
SOX	PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.002	0.085	179.282	6.16	39.91	68.80	0.08	3.90	8,267
0.002	0.089	161.199	8.15	57.61	107.68	0.11	6.56	11,932
0.002	0.053	161.168	9.70	101.52	162.69	0.20	6.93	21,028
0.002	0.185	161.179	72.82	163.42	755.43	0.32	38.80	33,848
0.002	0.068	161.179	56.37	295.70	825.97	0.58	26.03	61,248
0.004	0.210	272.784	6.10	22.70	35.98	0.05	2.52	3,273
0.003	0.172	272.784	13.59	36.37	61.60	0.08	4.14	6,547
0.004	0.304	272.784	48.17	122.16	105.80	0.13	11.24	10,093
0.003	0.299	272.784	42.39	149.71	253.59	0.25	23.30	21,277
0.003	0.166	272.784	53.56	230.06	425.59	0.45	24.36	40,099
0.003	0.085	272.784	50.44	142.74	583.54	0.67	18.48	59,467
0.003	0.079	272.784	80.36	274.52	914.45	1.03	30.29	105,022
0.003	0.080	272.784	126.28	424.26	1,455.09	1.63	47.60	162,306
0.003	0.094	272.784	216.41	755.09	2,565.59	2.22	75.80	220,409
0.003	0.201	302.846	17.69	47.78	106.90	0.11	7.90	11,894
0.002	0.152	253.260	15.83	83.77	195.57	0.20	12.55	20,851
0.003	0.110	267.119	26.53	159.40	342.79	0.38	16.36	39,677
0.003	0.066	262.375	26.62	218.99	453.86	0.52	13.81	54,509
0.002	0.063	257.197	40.81	360.80	653.51	0.86	21.95	89,809
0.003	0.049	267.452	52.86	657.54	890.01	1.56	30.13	163,670
0.003	0.051	262.701	81.53	969.90	2,011.75	2.31	46.53	241,422
0.003	0.049	262.792	200.99	2,815.34	5,588.85	6.69	129.62	700,778
0.005	0.129	318.248	3.45	17.53	21.93	0.04	1.17	2,864
0.004	0.179	318.248	14.43	40.54	72.03	0.10	4.46	7,956
0.005	0.141	414.859	9.05	30.75	57.45	0.09	2.54	7,467
0.005	0.391	414.859	51.66	141.08	136.84	0.18	12.89	13,690
0.005	0.383	414.859	56.60	223.28	368.06	0.39	31.05	33,604
0.005	0.214	414.859	81.92	396.60	702.06	0.82	37.50	72,600
0.002	0.185	165.361	27.46	33.55	72.89	0.06	7.50	6,718
0.001	0.233	150.037	35.59	66.64	279.75	0.13	20.76	13,345
0.001	0.138	151.575	37.13	111.94	382.01	0.21	20.44	22,416
0.001	0.109	150.998	45.02	163.62	518.88	0.31	23.70	32,766
0.001	0.082	150.612	52.27	252.79	663.32	0.48	27.40	50,622
0.001	0.043	150.467	45.66	426.18	732.04	0.81	24.65	85,343
0.001	0.165	149.775	292.55	701.26	3,126.21	1.34	154.71	140,429
0.001	0.044	150.667	102.47	774.95	1,911.62	1.48	45.52	155,187
0.002	0.327	244.848	49.54	56.40	118.26	0.10	13.89	10,409
0.002	0.268	226.543	34.57	106.62	285.26	0.19	23.26	19,677
0.002	0.162	224.213	42.49	181.68	454.88	0.32	24.21	33,529
0.002	0.106	224.977	41.43	247.28	558.68	0.44	21.57	45,636
0.002	0.097	226.052	63.56	417.30	864.03	0.74	33.00	77,014
0.002	0.080	225.005	89.57	695.08	1,280.03	1.22	45.53	128,279
0.002	0.091	225.602	171.96	1,012.37	2,592.73	1.78	75.39	186,836

0.002	0.065	215.490	219.85	1,782.39	3,878.16	3.14	99.40	328,945
0.006	0.497	443.274	95.66	245.62	209.65	0.26	22.34	19,947
0.005	0.488	443.274	74.74	267.26	444.69	0.44	41.51	37,678
0.005	0.271	443.274	101.39	439.51	794.62	0.85	46.41	75,800
0.005	0.137	443.274	94.31	264.39	1,072.99	1.25	34.16	110,818
0.004	0.127	443.274	130.86	435.47	1,447.70	1.66	48.50	169,331
0.004	0.129	443.274	209.44	674.10	2,373.08	2.68	77.82	266,851
0.004	0.153	443.274	589.21	2,006.99	6,892.66	5.96	205.17	592,657
0.003	0.095	215.954	4.69	14.93	28.49	0.04	1.53	3,455
0.002	0.158	222.498	12.00	38.71	71.22	0.08	5.63	7,952
0.002	0.166	197.515	18.54	78.64	178.02	0.15	13.61	16,152
0.002	0.106	199.845	26.16	142.09	303.93	0.28	15.48	29,185
0.002	0.065	199.911	29.38	212.63	452.07	0.42	14.23	43,675
0.002	0.051	198.998	33.48	318.40	516.23	0.62	16.72	65,399
0.002	0.056	198.167	63.30	557.59	975.84	1.09	32.17	114,529
0.002	0.083	198.915	144.02	816.26	2,187.41	1.60	70.05	167,661
0.002	0.049	197.811	154.58	1,511.16	2,692.52	2.96	76.97	310,393
0.001	0.144	117.014	20.78	27.04	53.42	0.05	6.09	4,963
0.001	0.124	105.000	14.90	47.13	123.51	0.08	10.21	8,649
0.001	0.077	105.128	18.97	80.94	202.80	0.14	10.94	14,853
0.001	0.077	105.400	30.15	119.55	342.03	0.21	15.94	21,939
0.001	0.074	105.464	47.83	197.53	541.64	0.35	25.40	36,250
0.001	0.175	105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
0.007	0.264	420.542	7.35	32.07	49.66	0.07	2.91	4,626
0.005	0.239	420.542	12.86	44.40	75.18	0.10	4.55	7,990
0.005	0.365	420.542	45.97	126.31	136.07	0.18	12.03	13,878
0.005	0.363	420.542	57.83	225.99	385.36	0.41	30.48	35,326
0.005	0.202	420.542	69.58	336.45	624.47	0.72	30.88	64,343
0.005	0.108	420.542	65.70	210.52	864.87	1.08	24.82	96,304
0.004	0.102	420.542	93.24	362.74	1,242.61	1.50	36.91	152,657
0.004	0.103	420.542	155.71	585.59	2,063.66	2.48	60.55	246,438
0.004	0.132	420.542	416.30	1,473.95	5,170.91	4.78	149.33	475,212
0.002	0.351	223.006	51.45	45.32	104.49	0.08	13.76	8,733
0.002	0.346	213.457	50.83	100.79	384.90	0.19	31.52	19,424
0.002	0.202	218.677	54.23	167.88	538.90	0.31	29.89	32,353
0.002	0.075	216.129	32.08	229.18	480.01	0.42	15.30	44,167
0.002	0.059	214.209	35.94	325.87	457.50	0.60	17.25	62,800
0.002	0.132	213.737	238.77	882.83	2,987.59	1.62	104.76	170,135
0.002	0.079	213.348	352.94	2,206.16	5,283.43	4.06	156.99	425,161
0.002	0.260	252.543	29.98	48.93	95.67	0.09	9.78	9,511
0.002	0.256	230.112	27.35	88.22	231.16	0.16	19.09	17,150
0.002	0.134	228.344	35.64	185.68	404.86	0.34	21.13	36,096
0.002	0.100	227.030	42.83	249.74	593.28	0.46	21.45	48,549
0.002	0.078	227.570	50.05	391.51	720.27	0.73	25.94	76,107
0.002	0.072	228.677	80.44	674.69	1,193.76	1.25	41.49	131,154
0.002	0.272	227.753	473.17	1,171.61	5,344.58	2.17	271.92	227,753
0.002	0.157	221.300	601.91	1,965.18	7,208.97	3.65	271.39	382,018
0.002	0.227	214.818	18.98	18.95	63.67	0.06	6.61	6,260
0.002	0.248	197.461	33.04	52.05	253.74	0.16	21.59	17,191
0.002	0.136	199.007	37.60	95.73	372.50	0.30	21.66	31,620
0.002	0.106	198.561	45.40	126.86	526.81	0.40	22.42	41,899
0.002	0.080	201.274	64.48	226.95	767.74	0.72	29.83	74,958

0.002	0.105	201.944	141.82	401.04	1,631.66	1.26	69.20	132,458
0.002	0.081	200.314	165.78	544.15	2,431.49	1.72	72.38	179,728
0.002	0.081	202.675	325.22	1,082.55	4,521.20	3.41	142.87	357,557
0.002	0.207	243.349	21.27	50.85	87.92	0.09	7.88	9,249
0.002	0.225	216.550	27.11	97.10	236.60	0.17	18.36	17,662
0.002	0.150	216.191	40.43	181.24	438.41	0.31	22.85	32,967
0.002	0.107	218.894	44.71	261.02	607.90	0.45	23.28	47,479
0.002	0.085	220.052	58.62	431.71	804.60	0.75	30.24	78,528
0.002	0.063	217.501	73.64	714.65	1,149.95	1.24	37.84	129,994
0.002	0.061	216.996	103.05	990.33	1,822.34	1.72	50.86	180,140
0.002	0.089	211.650	206.74	1,310.94	3,059.35	2.28	100.23	238,459
0.002	0.192	199.186	19.63	34.13	68.30	0.07	6.74	6,992
0.002	0.208	177.921	22.14	63.57	181.29	0.12	15.23	13,022
0.002	0.120	178.621	30.86	130.06	332.67	0.25	17.94	26,642
0.002	0.107	179.141	42.66	182.83	521.49	0.36	22.39	37,451
0.002	0.071	179.029	49.81	310.02	658.00	0.61	25.06	63,504
0.002	0.056	179.232	66.35	517.60	955.81	1.01	33.02	106,023
0.002	0.052	178.698	100.98	772.06	1,866.26	1.51	46.23	158,148
0.002	0.035	178.698	119.85	1,744.77	2,894.70	3.41	69.84	357,397
0.002	0.255	229.351	29.30	42.74	85.16	0.08	9.10	8,198
0.002	0.208	207.401	27.06	100.73	241.13	0.18	19.41	19,322
0.002	0.142	206.802	34.94	155.86	370.65	0.29	20.57	29,897
0.002	0.114	206.479	48.31	234.96	603.13	0.43	24.85	45,071
0.002	0.087	205.960	54.66	355.79	711.49	0.65	28.90	68,248
0.002	0.043	206.729	44.29	608.45	749.11	1.11	24.00	116,716
0.002	0.042	206.729	72.75	994.72	1,637.42	1.82	38.34	190,811
0.002	0.041	206.729	76.74	1,131.59	1,807.78	2.07	42.80	217,066
0.002	0.258	242.445	31.83	55.17	95.85	0.09	9.97	9,364
0.002	0.216	215.808	25.65	101.18	221.65	0.16	17.22	17,175
0.002	0.136	217.612	38.98	202.73	423.80	0.33	21.51	34,412
0.002	0.047	218.209	19.06	274.09	388.70	0.44	9.94	46,525
0.002	0.052	214.495	29.82	413.69	487.54	0.67	16.99	70,222
0.002	0.041	217.241	46.26	959.87	747.21	1.56	30.89	162,931
0.002	0.168	204.851	15.01	45.07	66.39	0.07	5.83	7,132
0.002	0.190	186.321	24.77	104.31	220.09	0.16	16.87	16,508
0.002	0.103	185.337	26.19	173.79	314.89	0.26	15.29	27,505
0.002	0.076	185.649	31.40	252.99	442.63	0.38	16.30	40,038
0.002	0.065	184.815	42.50	395.59	609.01	0.60	22.05	62,608
0.002	0.040	186.129	54.53	711.52	941.08	1.08	24.03	112,608
0.002	0.076	185.931	151.21	989.20	2,212.04	1.50	63.73	156,554
0.004	0.074	244.369	2.28	11.94	14.28	0.03	0.59	1,955
0.003	0.107	170.490	3.52	15.37	23.80	0.03	1.39	2,216
0.002	0.097	170.490	5.21	18.00	30.48	0.04	1.84	3,239
0.002	0.128	170.490	16.90	49.75	61.49	0.08	4.86	6,479
0.002	0.128	170.490	16.01	66.52	113.59	0.13	8.22	10,911
0.007	0.324	420.542	6.27	23.33	36.97	0.05	2.59	3,364
0.005	0.266	420.542	18.33	49.07	83.10	0.11	5.58	8,831
0.005	0.381	420.542	55.23	149.07	154.20	0.20	14.10	15,560
0.005	0.378	420.542	59.85	229.56	391.27	0.41	31.78	35,326
0.005	0.210	420.542	71.24	337.19	625.86	0.71	31.78	63,502
0.005	0.113	420.542	64.82	203.15	832.29	1.03	24.44	91,258
0.004	0.105	420.542	99.47	383.70	1,288.46	1.54	39.15	156,442



0.004	0.107	420.542	169.60	634.35	2,191.49	2.60	65.77	258,633
0.004	0.134	420.542	548.91	1,958.91	6,756.32	6.17	196.11	613,991
0.002	0.190	218.688	18.84	42.13	74.49	0.07	6.79	7,802
0.002	0.200	197.247	26.50	92.50	232.50	0.16	17.38	17,133
0.002	0.097	196.122	23.66	152.24	293.85	0.27	13.89	28,198
0.002	0.091	196.855	39.15	226.64	535.36	0.40	19.35	41,979
0.002	0.103	198.619	66.00	359.10	834.73	0.64	34.58	66,513
0.002	0.117	196.512	123.18	552.23	1,660.98	0.98	60.85	102,285
0.002	0.193	234.014	24.15	60.18	104.98	0.11	9.12	11,065
0.002	0.141	210.578	18.70	110.31	210.54	0.19	13.63	20,284
0.002	0.077	210.049	15.55	148.03	232.10	0.26	10.03	27,220
0.002	0.127	211.298	50.56	239.37	599.48	0.42	26.55	44,015
0.002	0.068	207.953	51.62	422.84	874.30	0.74	25.50	77,751
0.002	0.316	210.233	378.53	714.57	3,757.82	1.25	197.40	131,396
0.002	0.340	226.605	50.49	44.08	108.69	0.09	14.14	9,423
0.002	0.329	208.430	40.49	79.55	305.08	0.16	26.81	17,006
0.002	0.220	207.429	58.73	145.23	579.81	0.30	32.98	31,048
0.002	0.157	208.074	62.49	205.35	688.03	0.42	33.02	43,899
0.002	0.159	210.243	108.13	348.19	1,204.20	0.71	56.22	74,437
0.002	0.108	207.200	127.77	566.12	1,722.98	1.16	62.83	121,025
0.002	0.257	210.269	35.55	41.22	94.25	0.08	10.72	8,767
0.002	0.243	187.309	30.51	75.86	239.67	0.15	20.93	16,136
0.002	0.137	188.970	36.14	133.25	369.77	0.27	20.52	28,345
0.002	0.071	188.407	31.53	182.37	437.81	0.37	14.69	38,794
0.002	0.076	188.111	50.98	282.71	646.19	0.57	24.17	60,137
0.002	0.072	182.949	90.32	516.45	1,106.68	1.05	43.53	109,857
0.002	0.069	188.751	126.88	742.53	2,026.66	1.51	57.83	157,949
0.002	0.062	187.956	218.85	1,343.95	3,422.35	2.73	95.05	285,882
0.003	0.416	279.274	55.54	45.54	115.65	0.10	15.04	10,094
0.002	0.246	258.681	29.75	98.42	287.57	0.21	20.72	21,814
0.002	0.214	256.133	63.94	192.02	682.77	0.41	35.60	42,560
0.002	0.208	250.581	89.06	254.34	1,014.46	0.54	46.69	56,374
0.002	0.129	252.625	95.52	434.65	1,222.75	0.92	49.27	96,338
0.002	0.100	252.729	109.92	644.17	1,495.15	1.36	56.58	142,779
0.002	0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.002	0.125	257.796	459.77	2,236.99	6,593.28	4.73	240.52	495,821
0.007	0.129	466.006	3.25	17.07	20.38	0.04	0.77	2,796
0.006	0.423	443.274	62.93	168.42	164.45	0.21	15.63	16,401
0.005	0.418	443.274	63.19	241.42	404.83	0.43	34.26	36,348
0.005	0.233	443.274	81.19	380.84	692.53	0.79	36.79	70,037
0.006	0.148	535.623	85.27	260.76	1,057.41	1.30	32.03	115,694
0.002	0.148	215.380	14.87	59.90	83.56	0.09	6.44	9,362
0.002	0.117	193.045	10.52	87.12	126.93	0.13	8.22	13,616
0.002	0.088	191.530	22.60	187.40	279.35	0.28	13.42	29,290
0.002	0.083	190.208	29.95	244.05	411.60	0.36	16.63	38,143
0.002	0.058	187.666	31.34	332.20	468.77	0.50	16.12	51,921
0.002	0.035	192.714	24.87	653.51	462.95	0.98	18.56	102,138
0.002	0.109	192.714	244.27	1,233.03	3,026.41	1.84	109.20	192,714
0.002	0.141	177.887	13.96	30.15	60.44	0.06	5.02	6,345
0.002	0.129	157.570	16.71	66.39	160.08	0.13	11.43	13,973
0.001	0.094	157.071	25.91	112.67	294.22	0.23	14.20	23,714
0.002	0.063	159.431	27.57	163.67	409.51	0.33	13.52	34,447

0.001	0.041	156.839	27.82	270.03	466.17	0.54	14.84	56,832
0.002	0.034	157.782	35.06	461.11	660.29	0.93	20.92	97,048
0.002	0.048	158.229	89.24	612.18	1,541.81	1.23	39.22	128,844
0.001	0.051	155.194	127.56	841.35	2,056.73	1.69	57.63	177,076
0.003	0.276	265.154	30.01	54.93	94.09	0.09	9.82	9,436
0.002	0.297	239.305	33.24	108.00	264.89	0.18	23.00	18,552
0.002	0.252	238.803	72.48	221.69	721.28	0.36	40.21	38,082
0.002	0.129	237.291	51.04	282.36	652.92	0.46	26.41	48,504
0.002	0.115	238.264	62.14	419.57	819.60	0.69	34.84	72,075
0.002	0.043	238.264	46.78	1,176.17	1,519.80	1.93	36.25	202,048
0.002	0.199	209.740	22.21	37.63	78.85	0.08	7.62	8,034
0.002	0.181	195.696	20.52	75.75	186.69	0.15	14.94	16,174
0.002	0.102	191.861	25.39	129.33	291.54	0.26	14.71	27,615
0.002	0.063	192.169	26.49	183.79	405.52	0.37	12.92	39,244
0.002	0.062	193.392	39.77	289.95	588.42	0.59	19.69	61,913
0.002	0.056	190.073	62.79	511.49	923.00	1.04	32.33	109,219
0.002	0.029	194.759	60.25	794.79	1,379.01	1.62	24.87	169,713
0.002	0.067	193.002	269.41	1,812.80	4,356.47	3.70	134.98	387,090
0.003	0.255	293.853	26.72	65.03	110.40	0.11	10.14	11,689
0.003	0.300	265.064	37.90	121.02	316.46	0.21	24.65	21,750
0.002	0.220	260.384	58.24	208.43	619.10	0.36	31.68	37,462
0.003	0.146	264.178	63.25	321.05	813.54	0.55	31.85	57,702
0.003	0.086	262.615	59.03	523.85	840.38	0.90	30.85	94,152
0.003	0.049	264.046	49.39	909.75	831.98	1.56	30.17	163,510
0.003	0.293	262.792	504.58	1,257.44	5,625.49	2.16	252.22	226,001
0.004	0.197	255.735	5.24	19.50	30.92	0.04	2.17	2,813
0.003	0.162	255.735	10.62	28.42	48.13	0.06	3.23	5,115
0.003	0.265	255.735	50.97	131.52	120.79	0.15	12.21	11,764
0.003	0.262	255.735	33.69	122.37	207.95	0.21	18.31	17,901
0.003	0.145	255.735	55.90	248.20	460.22	0.50	25.28	44,498
0.003	0.076	255.735	43.12	126.46	516.24	0.61	16.04	53,960
0.003	0.071	255.735	54.50	195.31	648.77	0.75	20.95	75,953
0.002	0.227	214.818	18.979	18.953	63.672	0.060	6.613	6259.883
0.002	0.248	197.461	33.045	52.050	253.738	0.164	21.593	17191.451
0.002	0.136	199.007	37.595	95.734	372.500	0.302	21.661	31620.039
0.002	0.106	198.561	45.396	126.857	526.813	0.400	22.423	41899.450
0.002	0.080	201.274	64.476	226.946	767.740	0.716	29.828	74957.954
0.002	0.105	201.944	141.824	401.037	1631.663	1.265	69.198	132458.272
0.002	0.081	200.314	165.780	544.152	2431.490	1.716	72.378	179727.779
0.002	0.081	202.675	325.225	1082.554	4521.201	3.414	142.868	357556.588

g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
SOX	PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.002	0.007	179.282	2.41	39.91	41.31	0.08	0.34	8,267
0.002	0.009	161.199	2.50	57.61	37.11	0.11	0.69	11,932

0.002	0.008	161.168	3.85	101.52	28.89	0.20	1.09	21,028
0.002	0.003	161.179	3.78	163.42	16.84	0.32	0.58	33,848
0.002	0.003	161.179	9.23	295.70	75.23	0.58	1.07	61,248
0.004	0.099	272.784	4.09	20.28	25.47	0.05	1.19	3,273
0.003	0.094	272.784	8.55	27.98	51.59	0.08	2.25	6,547
0.004	0.093	272.784	14.86	88.44	73.80	0.13	3.45	10,093
0.003	0.084	272.784	15.91	137.26	109.88	0.25	6.57	21,277
0.003	0.052	272.784	23.47	225.42	145.80	0.45	7.59	40,099
0.003	0.027	272.784	27.44	115.41	178.58	0.67	5.84	59,467
0.003	0.026	272.784	47.31	195.85	286.50	1.03	9.97	105,022
0.003	0.026	272.784	73.34	302.68	452.15	1.63	15.59	162,306
0.003	0.038	272.784	107.46	434.32	1,336.46	2.22	30.51	220,409
0.003	0.121	294.978	13.04	46.54	84.56	0.11	4.75	11,585
0.002	0.054	257.343	8.27	85.12	100.31	0.20	4.43	21,187
0.003	0.029	265.752	10.69	158.58	96.16	0.38	4.24	39,473
0.002	0.019	260.958	12.56	217.81	121.41	0.52	3.90	54,215
0.002	0.018	260.085	19.75	364.85	181.65	0.87	6.17	90,817
0.003	0.014	265.623	29.23	653.04	237.73	1.55	8.63	162,551
0.003	0.009	263.274	27.46	972.02	1,052.04	2.31	8.39	241,949
0.003	0.055	262.792	279.11	2,815.34	5,788.79	6.69	146.44	700,778
0.005	0.091	318.248	3.33	17.49	20.88	0.04	0.82	2,864
0.004	0.099	318.248	9.87	33.15	61.60	0.10	2.46	7,956
0.005	0.118	414.859	9.01	30.75	56.93	0.09	2.13	7,467
0.005	0.116	414.859	15.92	106.55	94.83	0.18	3.82	13,690
0.005	0.105	414.859	20.34	207.84	158.84	0.39	8.54	33,604
0.005	0.065	414.859	34.22	392.55	230.78	0.82	11.40	72,600
0.002	0.174	165.291	24.85	33.54	69.05	0.06	7.06	6,716
0.001	0.100	150.009	15.50	66.63	131.94	0.13	8.86	13,343
0.001	0.071	151.476	20.37	111.86	196.71	0.21	10.49	22,401
0.001	0.042	150.964	20.66	163.59	221.41	0.31	9.19	32,759
0.001	0.034	150.707	26.44	252.95	280.20	0.48	11.36	50,654
0.001	0.026	150.163	34.25	425.32	367.81	0.81	14.52	85,171
0.001	0.111	149.743	200.70	701.11	2,242.54	1.34	104.11	140,399
0.001	0.018	150.667	62.53	774.95	708.15	1.48	18.48	155,187
0.002	0.231	245.195	36.22	56.48	98.06	0.10	9.82	10,423
0.002	0.175	226.134	23.39	106.43	189.98	0.19	15.19	19,641
0.002	0.092	224.017	26.12	181.52	245.38	0.32	13.70	33,500
0.002	0.060	224.269	27.85	246.50	325.02	0.43	12.26	45,492
0.002	0.048	225.369	38.87	416.04	400.92	0.73	16.23	76,781
0.002	0.034	224.639	50.62	693.95	519.62	1.22	19.40	128,070
0.002	0.070	223.606	132.54	1,003.41	2,103.36	1.77	57.68	185,183
0.002	0.067	215.490	231.45	1,782.39	3,868.66	3.14	102.41	328,945
0.006	0.135	443.274	27.95	178.36	143.30	0.26	6.06	19,947
0.005	0.120	443.274	27.21	245.63	182.88	0.44	10.22	37,678
0.005	0.075	443.274	43.17	431.80	248.34	0.85	12.81	75,800
0.005	0.039	443.274	50.86	217.27	296.76	1.25	9.77	110,818
0.004	0.038	443.274	76.20	318.11	414.01	1.66	14.47	169,331
0.004	0.038	443.274	120.26	501.44	665.28	2.68	22.87	266,851
0.004	0.057	443.274	313.81	1,169.23	3,452.74	5.96	76.17	592,657
0.003	0.062	215.954	4.17	14.23	26.34	0.04	0.99	3,455
0.002	0.061	222.311	6.83	38.68	50.50	0.08	2.18	7,945
0.002	0.053	197.848	8.23	78.77	81.40	0.15	4.30	16,179

0.002	0.031	199.780	11.16	142.04	93.59	0.28	4.53	29,176
0.002	0.017	199.716	12.96	212.43	115.65	0.42	3.63	43,632
0.002	0.013	198.730	16.81	317.97	130.51	0.62	4.38	65,311
0.002	0.018	198.552	34.64	558.67	283.95	1.10	10.42	114,751
0.002	0.026	198.235	57.26	813.47	1,144.89	1.60	21.70	167,088
0.002	0.009	197.811	50.05	1,511.16	1,372.45	2.96	13.52	310,393
0.001	0.054	117.014	7.67	27.04	36.76	0.05	2.30	4,963
0.001	0.045	105.000	6.27	47.13	55.63	0.08	3.69	8,649
0.001	0.027	105.128	8.10	80.94	70.42	0.14	3.76	14,853
0.001	0.018	105.400	10.33	119.55	97.04	0.21	3.76	21,939
0.001	0.015	105.464	16.76	197.53	137.57	0.35	5.31	36,250
0.001	0.004	105.117	17.17	504.07	420.01	0.88	3.74	92,503
0.007	0.145	420.542	5.11	28.66	35.84	0.07	1.59	4,626
0.005	0.141	420.542	9.95	34.15	62.96	0.10	2.68	7,990
0.005	0.113	420.542	14.13	94.72	94.11	0.18	3.72	13,878
0.005	0.106	420.542	19.35	208.75	171.26	0.41	8.87	35,326
0.005	0.063	420.542	26.51	331.44	218.50	0.72	9.69	64,343
0.005	0.034	420.542	30.16	171.38	269.70	1.08	7.86	96,304
0.004	0.033	420.542	45.96	266.25	391.65	1.50	12.07	152,657
0.004	0.034	420.542	74.95	429.81	645.26	2.48	19.71	246,438
0.004	0.049	420.542	178.18	876.24	2,729.57	4.78	55.90	475,212
0.002	0.243	223.232	35.28	45.36	85.34	0.08	9.52	8,742
0.002	0.201	212.640	31.00	100.40	236.53	0.18	18.33	19,350
0.002	0.094	216.686	27.87	166.35	249.41	0.31	13.86	32,058
0.002	0.051	214.726	26.83	227.69	324.73	0.42	10.33	43,880
0.002	0.044	213.680	39.00	325.06	335.72	0.60	12.97	62,645
0.002	0.009	213.737	33.45	882.83	777.47	1.62	7.03	170,135
0.002	0.086	213.348	421.97	2,206.16	5,504.86	4.06	171.77	425,161
0.002	0.113	253.380	13.32	49.09	70.17	0.09	4.24	9,542
0.002	0.096	229.287	11.83	87.91	110.35	0.16	7.12	17,089
0.002	0.047	228.118	16.66	185.50	154.12	0.34	7.39	36,060
0.002	0.026	227.307	17.50	250.05	161.34	0.46	5.59	48,608
0.002	0.015	226.496	20.10	389.67	145.58	0.72	5.15	75,748
0.002	0.024	227.697	44.69	671.79	357.95	1.25	13.61	130,592
0.002	0.029	227.753	77.45	1,171.61	1,058.97	2.17	28.60	227,753
0.002	0.045	234.008	215.48	2,078.03	2,897.03	3.86	77.36	403,956
0.002	0.103	217.399	9.12	19.18	47.80	0.06	2.99	6,335
0.002	0.078	196.774	14.18	51.87	112.38	0.16	6.80	17,132
0.002	0.033	198.929	15.29	95.70	109.89	0.30	5.32	31,608
0.002	0.024	198.690	18.09	126.94	130.38	0.40	5.13	41,927
0.002	0.021	200.847	29.19	226.46	211.88	0.71	7.70	74,799
0.002	0.033	200.535	69.04	398.24	568.12	1.26	21.96	131,534
0.002	0.033	199.844	83.87	542.87	1,316.60	1.71	29.43	179,306
0.002	0.025	202.442	136.70	1,081.31	2,248.97	3.41	43.91	357,147
0.002	0.144	243.532	15.20	50.88	74.85	0.09	5.49	9,256
0.002	0.120	217.362	15.60	97.46	138.86	0.17	9.77	17,729
0.002	0.065	216.117	19.56	181.18	189.68	0.31	9.90	32,956
0.002	0.040	218.776	20.82	260.88	229.07	0.45	8.63	47,453
0.002	0.031	219.056	29.18	429.76	292.84	0.75	11.01	78,173
0.002	0.028	217.902	46.45	715.97	504.87	1.24	16.96	130,234
0.002	0.018	218.235	38.07	995.98	903.45	1.73	14.94	181,169
0.002	0.027	211.503	79.08	1,310.02	1,515.15	2.28	30.75	238,293

0.002	0.081	199.186	8.81	34.13	50.34	0.07	2.85	6,992
0.002	0.068	177.921	8.87	63.57	80.02	0.12	4.98	13,022
0.002	0.038	178.621	12.99	130.06	109.56	0.25	5.65	26,642
0.002	0.019	179.141	13.96	182.83	125.64	0.36	4.06	37,451
0.002	0.017	179.029	22.17	310.02	173.75	0.61	6.05	63,504
0.002	0.016	179.232	31.51	517.60	214.76	1.01	9.26	106,023
0.002	0.027	178.698	59.33	772.06	1,192.08	1.51	23.99	158,148
0.002	0.007	178.698	53.50	1,744.77	1,588.53	3.41	13.43	357,397
0.002	0.152	229.351	16.32	42.74	69.53	0.08	5.44	8,198
0.002	0.048	207.401	9.53	100.73	94.53	0.18	4.45	19,322
0.002	0.041	206.802	13.49	155.86	108.23	0.29	5.87	29,897
0.002	0.033	206.479	20.66	234.96	209.29	0.43	7.13	45,071
0.002	0.033	205.960	31.04	355.79	270.17	0.65	10.92	68,248
0.002	0.026	206.729	43.97	608.45	349.21	1.11	14.56	116,716
0.002	0.009	206.729	38.70	994.72	875.13	1.82	7.98	190,811
0.002	0.008	206.729	33.04	1,131.59	966.26	2.07	8.20	217,066
0.002	0.137	242.479	18.33	55.18	70.93	0.09	5.29	9,366
0.002	0.103	216.381	12.91	101.45	120.97	0.16	8.20	17,220
0.002	0.043	217.566	14.77	202.69	143.17	0.33	6.80	34,405
0.002	0.023	217.387	13.02	273.06	168.27	0.44	4.85	46,349
0.002	0.026	214.457	21.35	413.62	246.19	0.67	8.58	70,209
0.002	0.004	217.241	17.06	959.87	80.70	1.56	2.74	162,931
0.002	0.067	204.827	7.40	45.06	47.43	0.07	2.33	7,132
0.002	0.061	186.254	9.73	104.27	94.37	0.16	5.38	16,502
0.002	0.036	185.159	11.73	173.63	109.26	0.26	5.33	27,479
0.002	0.029	185.751	15.67	253.13	170.64	0.38	6.36	40,060
0.002	0.026	184.486	22.26	394.89	224.87	0.60	8.67	62,496
0.002	0.014	186.140	33.03	711.57	378.81	1.08	8.25	112,615
0.002	0.014	185.931	31.61	989.20	700.76	1.50	11.54	156,554
0.004	0.070	244.369	2.28	11.94	14.25	0.03	0.56	1,955
0.003	0.059	170.490	2.45	13.73	17.17	0.03	0.76	2,216
0.002	0.057	170.490	4.03	13.85	25.53	0.04	1.09	3,239
0.002	0.037	170.490	4.70	37.68	42.21	0.08	1.42	6,479
0.002	0.036	170.490	4.80	61.56	50.68	0.13	2.29	10,911
0.007	0.153	420.542	4.20	20.85	26.17	0.05	1.22	3,364
0.005	0.145	420.542	11.53	37.75	69.59	0.11	3.04	8,831
0.005	0.120	420.542	17.37	111.48	106.91	0.20	4.43	15,560
0.005	0.111	420.542	20.63	211.92	173.67	0.41	9.36	35,326
0.005	0.067	420.542	28.07	331.99	219.16	0.71	10.10	63,502
0.005	0.036	420.542	30.80	164.87	259.98	1.03	7.77	91,258
0.004	0.035	420.542	50.90	276.02	407.00	1.54	12.88	156,442
0.004	0.035	420.542	84.83	456.33	686.86	2.60	21.55	258,633
0.004	0.051	420.542	244.78	1,146.30	3,565.15	6.17	74.43	613,991
0.002	0.094	218.513	10.34	42.09	55.26	0.07	3.35	7,796
0.002	0.070	196.997	10.58	92.38	104.91	0.16	6.05	17,112
0.002	0.030	196.173	9.28	152.28	92.47	0.27	4.25	28,206
0.002	0.029	196.824	15.62	226.61	176.95	0.40	6.15	41,973
0.002	0.036	199.097	28.64	359.96	309.52	0.64	12.21	66,673
0.002	0.004	196.512	18.76	552.23	138.53	0.98	1.87	102,285
0.002	0.095	233.820	15.69	60.13	76.82	0.11	4.51	11,056
0.002	0.029	210.694	6.43	110.37	81.25	0.19	2.83	20,296
0.002	0.021	210.065	6.52	148.04	73.18	0.26	2.66	27,223

0.002	0.015	210.450	10.38	238.41	135.40	0.42	3.11	43,838
0.002	0.004	207.786	10.74	422.50	83.87	0.74	1.34	77,689
0.002	0.004	210.233	28.72	714.57	336.54	1.25	2.38	131,396
0.002	0.146	229.237	21.68	44.59	74.81	0.09	6.09	9,533
0.002	0.198	209.337	26.07	79.89	199.94	0.16	16.13	17,080
0.002	0.129	207.543	37.17	145.31	343.65	0.30	19.31	31,066
0.002	0.095	207.851	41.93	205.13	420.88	0.42	19.98	43,852
0.002	0.087	209.907	69.55	347.64	672.88	0.71	30.78	74,318
0.002	0.086	207.159	111.15	566.01	1,413.64	1.16	50.38	121,001
0.002	0.128	210.348	18.61	41.23	71.63	0.08	5.35	8,771
0.002	0.096	186.981	14.36	75.72	117.45	0.15	8.31	16,108
0.002	0.049	188.758	16.75	133.10	136.65	0.27	7.37	28,313
0.002	0.028	188.348	17.63	182.32	174.84	0.37	5.86	38,782
0.002	0.029	187.636	28.65	282.00	251.60	0.57	9.39	59,985
0.002	0.029	185.909	52.95	524.80	455.60	1.07	17.38	111,634
0.002	0.027	189.532	61.00	745.60	1,094.94	1.51	22.55	158,603
0.002	0.033	187.941	132.71	1,343.84	2,277.93	2.73	49.83	285,858
0.003	0.407	279.274	55.40	45.54	110.81	0.10	14.69	10,094
0.002	0.238	258.369	28.98	98.30	262.60	0.21	20.09	21,787
0.002	0.098	255.853	32.70	191.81	307.24	0.41	16.32	42,514
0.002	0.077	250.791	38.78	254.55	398.19	0.54	17.36	56,421
0.002	0.054	252.908	50.77	435.14	529.55	0.92	20.67	96,446
0.002	0.043	251.865	63.90	641.97	674.62	1.36	24.51	142,292
0.002	0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.002	0.076	257.796	312.89	2,236.99	4,803.53	4.73	145.98	495,821
0.007	0.133	466.006	3.25	17.07	20.38	0.04	0.80	2,796
0.006	0.121	443.274	18.93	124.86	111.98	0.21	4.46	16,401
0.005	0.111	443.274	21.62	222.90	170.73	0.43	9.08	36,348
0.005	0.067	443.274	32.07	375.17	222.02	0.79	10.65	70,037
0.006	0.043	535.622	41.64	213.45	300.45	1.30	9.33	115,694
0.002	0.038	215.256	6.12	59.87	54.98	0.09	1.65	9,357
0.002	0.030	192.868	4.46	87.04	56.90	0.13	2.11	13,604
0.002	0.026	191.125	9.15	187.01	88.16	0.28	4.00	29,228
0.002	0.015	188.307	8.17	241.61	98.16	0.36	2.98	37,762
0.002	0.003	187.666	8.43	332.20	60.12	0.50	0.93	51,921
0.002	0.039	192.714	36.29	653.51	478.06	0.98	20.79	102,138
0.002	0.057	192.714	122.26	1,233.03	1,720.67	1.84	57.31	192,714
0.002	0.047	178.979	4.82	30.33	42.06	0.06	1.66	6,384
0.002	0.053	158.203	8.20	66.66	86.89	0.13	4.67	14,029
0.001	0.039	156.697	11.37	112.41	122.96	0.23	5.93	23,657
0.002	0.026	159.311	13.36	163.55	173.74	0.33	5.55	34,421
0.002	0.017	157.164	15.12	270.59	170.14	0.54	6.28	56,949
0.002	0.016	157.122	22.31	459.18	251.28	0.92	9.70	96,642
0.002	0.020	157.360	37.51	608.82	805.56	1.22	15.92	128,136
0.001	0.009	155.194	28.91	841.35	768.17	1.69	10.77	177,076
0.003	0.152	265.154	17.11	54.93	72.80	0.09	5.42	9,436
0.002	0.106	239.305	13.77	108.00	122.64	0.18	8.20	18,552
0.002	0.066	238.803	24.44	221.69	218.14	0.36	10.51	38,082
0.002	0.023	237.291	14.85	282.36	149.46	0.46	4.65	48,504
0.002	0.108	238.264	64.38	419.57	751.15	0.69	32.81	72,075
0.002	0.008	238.264	20.32	1,176.17	871.58	1.93	6.80	202,048
0.002	0.080	210.026	10.16	37.68	56.89	0.08	3.07	8,045

0.002	0.052	194.283	8.29	75.20	80.62	0.15	4.34	16,058
0.002	0.033	190.977	11.10	128.73	92.96	0.26	4.73	27,488
0.002	0.025	191.926	14.73	183.55	146.18	0.37	5.04	39,195
0.002	0.020	191.572	19.79	287.22	169.52	0.59	6.25	61,330
0.002	0.035	190.500	51.48	512.64	519.46	1.05	19.98	109,465
0.002	0.018	194.474	42.23	793.63	939.91	1.62	16.06	169,465
0.002	0.023	193.002	128.96	1,812.80	2,366.45	3.70	45.15	387,090
0.003	0.138	293.394	15.11	64.93	85.32	0.11	5.50	11,670
0.003	0.175	264.613	22.83	120.81	202.60	0.21	14.36	21,713
0.002	0.106	260.386	29.92	208.43	296.65	0.36	15.29	37,462
0.003	0.081	263.792	38.47	320.58	422.89	0.55	17.61	57,618
0.003	0.047	261.973	39.95	522.57	398.55	0.90	16.88	93,922
0.003	0.004	264.035	18.52	909.71	93.78	1.56	2.78	163,504
0.003	0.312	262.792	528.45	1,257.44	5,772.62	2.16	268.22	226,001
0.004	0.093	255.735	3.51	17.43	21.89	0.04	1.02	2,813
0.003	0.088	255.735	6.68	21.86	40.30	0.06	1.76	5,115
0.003	0.084	255.735	16.18	96.71	84.23	0.15	3.86	11,764
0.003	0.077	255.735	12.43	112.65	91.29	0.21	5.37	17,901
0.003	0.046	255.735	23.90	243.93	159.78	0.50	8.08	44,498
0.003	0.024	255.735	22.57	102.16	160.18	0.61	5.10	53,960
0.003	0.023	255.735	30.94	138.94	204.68	0.75	6.94	75,953
0.002	0.103	217.399	9.116	19.180	47.802	0.060	2.990	6335.094
0.002	0.078	196.774	14.177	51.869	112.382	0.164	6.801	17131.671
0.002	0.033	198.929	15.292	95.697	109.886	0.302	5.322	31607.627
0.002	0.024	198.690	18.094	126.939	130.384	0.400	5.133	41926.530
0.002	0.021	200.847	29.195	226.464	211.881	0.714	7.705	74798.827
0.002	0.033	200.535	69.040	398.240	568.120	1.256	21.959	131534.479
0.002	0.033	199.844	83.872	542.875	1316.601	1.712	29.433	179305.935
0.002	0.025	202.442	136.698	1081.314	2248.971	3.411	43.908	357146.923

2012

		2012		g/hp/hr	g/hp/hr	g/hp/hr
AvgHP		Equipment	MaxHP	ROG	CO	NOX
0	46	Aerial Lifts	50	0.122	0.866	1.439
50	74		120	0.094	0.778	1.352
120	130		175	0.075	0.778	1.241
175	210		250	0.350	0.778	3.616
250	380		500	0.150	0.778	2.182
0	12	Air Compressors	15	0.480	1.854	2.864
15	24		25	0.529	1.451	2.509
25	37		50	1.202	3.191	2.812
50	78		120	0.506	1.900	3.055
120	147		175	0.342	1.559	2.715
175	218		250	0.217	0.627	2.493
250	385		500	0.197	0.663	2.203
500	595		750	0.200	0.663	2.273
750	808		1000	0.249	0.854	2.998
0	39	Bore/Drill Rigs	50	0.461	1.217	2.740
50	82		120	0.194	1.018	2.366
120	149		175	0.177	1.075	2.275
175	208		250	0.132	1.054	2.169
250	349		500	0.120	1.034	1.866
500	612		750	0.087	1.072	1.399
750	919		1000	0.093	1.055	2.201
1000	2667		9999	0.081	1.056	2.110
0	9	Cement and Mortar	15	0.378	1.944	2.393
15	25		25	0.532	1.544	2.807
0	18	Concrete/Industrial	25	0.501	1.708	3.174
25	33		50	1.439	4.142	4.081
50	81		120	0.647	2.731	4.268
120	175		175	0.437	2.259	3.761
0	41	Cranes	50	0.652	0.826	1.777
50	89		120	0.393	0.749	3.092
120	148		175	0.251	0.757	2.576
175	217		250	0.209	0.754	2.392
250	336		500	0.155	0.752	1.956
500	567		750	0.082	0.751	1.284
750	938		1000	0.313	0.748	3.339
1000	1030		9999	0.101	0.752	1.868
0	43	Crawler Tractors	50	1.180	1.327	2.793
50	87		120	0.402	1.228	3.293
120	150		175	0.288	1.215	3.050
175	203		250	0.207	1.219	2.761
250	341		500	0.189	1.225	2.535
500	570		750	0.160	1.219	2.254
750	828		1000	0.210	1.223	3.149



1000	1527		9999	0.147	1.168	2.556
0	45	Crushing/Proc	50	1.943	5.255	4.577
50	85		120	0.814	3.109	4.893
120	171		175	0.554	2.559	4.336
175	250		250	0.354	1.013	3.973
250	382		500	0.324	1.062	3.496
500	602		750	0.328	1.047	3.636
750	1337		9999	0.411	1.370	4.834
0	16	Dumpers/Tend	25	0.282	0.918	1.739
0	36	Excavators	50	0.342	1.083	1.984
50	82		120	0.227	0.962	2.151
120	146		175	0.180	0.973	2.058
175	218		250	0.135	0.973	2.034
250	329		500	0.104	0.969	1.549
500	578		750	0.112	0.965	1.676
750	843		1000	0.173	0.969	2.607
1000	1569		9999	0.102	0.963	1.727
0	42	Forklifts	50	0.495	0.638	1.262
50	82		120	0.181	0.572	1.494
120	141		175	0.135	0.573	1.431
175	208		250	0.146	0.574	1.637
250	344		500	0.141	0.575	1.579
500	880		1000	0.327	0.573	3.140
0	11	Generator Set	15	0.637	2.859	4.326
15	19		25	0.651	2.238	3.868
25	33		50	1.280	3.705	4.051
50	84		120	0.636	2.663	4.312
120	153		175	0.422	2.191	3.829
175	229		250	0.266	0.881	3.517
250	363		500	0.238	0.937	3.175
500	586		750	0.246	0.937	3.271
750	1130		9999	0.340	1.200	4.317
0	39	Graders	50	1.326	1.157	2.677
50	91		120	0.557	1.108	4.205
120	148		175	0.368	1.135	3.636
175	204		250	0.161	1.122	2.361
250	293		500	0.128	1.111	1.558
500	796		1000	0.302	1.109	3.778
1000	1993		9999	0.180	1.107	2.657
0	38	Off-Highway T	50	0.803	1.299	2.538
50	75		120	0.366	1.183	3.080
120	158		175	0.220	1.175	2.486
175	214		250	0.198	1.168	2.730
250	334		500	0.151	1.171	2.126
500	574		750	0.145	1.176	2.094
750	1000		1000	0.473	1.172	5.345
1000	1726		9999	0.351	1.139	4.202
0	29	Off-Highway T	50	0.665	0.651	2.212
50	87		120	0.370	0.596	2.851
120	159		175	0.237	0.602	2.317
175	211		250	0.217	0.601	2.459
250	372		500	0.177	0.609	2.053

500	656		750	0.222	0.611	2.504
750	897		1000	0.188	0.606	2.713
1000	1764		9999	0.184	0.614	2.506
0	38	Other Constru	50	0.566	1.338	2.319
50	82		120	0.333	1.190	2.890
120	152		175	0.267	1.188	2.873
175	217		250	0.208	1.204	2.787
250	357		500	0.168	1.210	2.253
500	598		750	0.126	1.196	1.921
750	830		1000	0.126	1.193	2.199
1000	1127		9999	0.187	1.164	2.739
0	35	Other General	50	0.570	0.972	1.952
50	73		120	0.303	0.869	2.465
120	149		175	0.206	0.872	2.202
175	209		250	0.203	0.875	2.441
250	355		500	0.143	0.874	1.845
500	592		750	0.114	0.875	1.605
750	885		1000	0.117	0.872	2.132
1000	2000		9999	0.066	0.872	1.462
0	36	Other Material	50	0.778	1.196	2.342
50	93		120	0.284	1.081	2.517
120	145		175	0.241	1.078	2.534
175	218		250	0.225	1.076	2.777
250	331		500	0.164	1.074	2.096
500	565		750	0.084	1.078	1.339
750	923		1000	0.084	1.078	1.791
1000	1050		9999	0.079	1.078	1.738
0	39	Pavers	50	0.835	1.429	2.435
50	80		120	0.324	1.271	2.772
120	158		175	0.248	1.282	2.676
175	213		250	0.092	1.286	1.833
250	327		500	0.094	1.264	1.495
500	750		750	0.065	1.280	1.001
0	35	Paving Equipm	50	0.433	1.294	1.898
50	89		120	0.284	1.177	2.500
120	148		175	0.177	1.171	2.107
175	216		250	0.148	1.173	2.064
250	339		500	0.128	1.168	1.807
500	605		750	0.093	1.176	1.564
750	842		1000	0.181	1.175	2.642
0	8	Plate Compac	15	0.284	1.492	1.781
0	13	Pressure Was	15	0.258	1.159	1.754
15	19		25	0.264	0.907	1.568
25	38		50	0.405	1.267	1.589
50	64		120	0.230	1.029	1.668
0	8	Pumps	15	0.740	2.859	4.415
15	21		25	0.816	2.238	3.868
25	37		50	1.374	3.900	4.095
50	84		120	0.659	2.706	4.378
120	151		175	0.439	2.225	3.889
175	217		250	0.277	0.897	3.572
250	372		500	0.248	0.964	3.213

500	615		750	0.256	0.964	3.310
750	1460		9999	0.348	1.231	4.366
0	36	Rollers	50	0.536	1.181	2.089
50	87		120	0.305	1.065	2.659
120	144		175	0.164	1.059	2.020
175	213		250	0.183	1.063	2.492
250	335		500	0.199	1.072	2.501
500	521		750	0.238	1.061	3.203
0	47	Rough Terrain	50	0.509	1.273	2.208
50	96		120	0.188	1.145	2.127
120	130		175	0.119	1.142	1.763
175	208		250	0.245	1.149	2.859
250	374		500	0.140	1.131	2.345
500	625		750	0.609	1.143	6.029
0	42	Rubber Tired L	50	1.230	1.060	2.627
50	82		120	0.501	0.975	3.756
120	150		175	0.394	0.970	3.879
175	211		250	0.300	0.973	3.270
250	354		500	0.307	0.983	3.393
500	584		750	0.221	0.969	2.957
0	42	Rubber Tired L	50	0.869	0.989	2.281
50	86		120	0.354	0.881	2.770
120	150		175	0.244	0.888	2.459
175	206		250	0.157	0.886	2.119
250	320		500	0.164	0.884	2.021
500	600		750	0.155	0.860	1.838
750	837		1000	0.155	0.887	2.436
1000	1521		9999	0.149	0.884	2.270
0	36	Scrapers	50	1.562	1.260	3.214
50	84		120	0.359	1.167	3.431
120	166		175	0.388	1.156	4.117
175	225		250	0.397	1.131	4.502
250	381		500	0.253	1.140	3.205
500	565		750	0.199	1.140	2.653
750	950		1000	0.593	1.138	6.460
1000	1923		9999	0.245	1.163	3.461
0	6	Signal Boards	15	0.542	2.845	3.397
15	37		50	1.558	4.395	4.366
50	82		120	0.710	2.913	4.622
120	158		175	0.477	2.401	4.096
175	216		250	0.367	1.157	4.535
0	43	Skid Steer Loa	50	0.334	1.378	1.890
50	71		120	0.144	1.235	1.745
120	153		175	0.150	1.225	1.835
175	201		250	0.153	1.216	2.067
250	277		500	0.114	1.201	1.685
500	530		750	0.050	1.233	0.877
750	1000		1000	0.245	1.233	3.032
0	36	Surfacing Equ	50	0.398	0.845	1.700
50	89		120	0.188	0.749	1.794
120	151		175	0.173	0.746	1.956
175	216		250	0.128	0.757	1.877

250	362		500	0.077	0.745	1.267
500	615		750	0.056	0.748	1.042
750	814		1000	0.110	0.752	1.900
1000	1141		9999	0.113	0.737	1.808
0	36	Sweepers/Scr	50	0.873	1.544	2.665
50	78		120	0.432	1.393	3.418
120	159		175	0.457	1.390	4.536
175	204		250	0.254	1.381	3.215
250	303		500	0.210	1.387	2.721
500	848		1000	0.062	1.387	1.807
0	38	Tractors/Load	50	0.576	0.982	2.053
50	83		120	0.248	0.916	2.240
120	144		175	0.179	0.899	2.022
175	204		250	0.132	0.900	1.982
250	320		500	0.127	0.905	1.827
500	575		750	0.112	0.890	1.587
750	871		1000	0.074	0.912	1.597
1000	2006		9999	0.140	0.904	2.196
0	40	Trenchers	50	0.683	1.635	2.781
50	82		120	0.465	1.475	3.867
120	144		175	0.401	1.449	4.250
175	218		250	0.293	1.470	3.743
250	359		500	0.163	1.461	2.304
500	619		750	0.060	1.470	1.029
750	860		1000	0.589	1.462	6.557
0	11	Welders	15	0.450	1.739	2.685
15	20		25	0.496	1.361	2.352
25	46		50	1.025	2.769	2.582
50	70		120	0.448	1.731	2.793
120	174		175	0.301	1.421	2.482
175	211		250	0.191	0.574	2.280
250	297		500	0.172	0.612	2.027
0	29	Water Trucks	50	0.665	0.651	2.212
50	87		120	0.370	0.596	2.851
120	159		175	0.237	0.602	2.317
175	211		250	0.217	0.601	2.459
250	372		500	0.177	0.609	2.053
500	656		750	0.222	0.611	2.504
750	897		1000	0.188	0.606	2.713
1000	1764		9999	0.184	0.614	2.506

2023

	2023		g/hp/hr	g/hp/hr	g/hp/hr	
AvgHP	Equipment	MaxHP	ROG	CO	NOX	
0	46	Aerial Lifts	50	0.052	0.866	0.893
50	74		120	0.032	0.778	0.477

120	130		175	0.027	0.778	0.176
175	210		250	0.019	0.778	0.080
250	380		500	0.025	0.778	0.199
0	12	Air Compresso	15	0.336	1.685	2.099
15	24		25	0.351	1.157	2.138
25	37		50	0.373	2.371	1.939
50	78		120	0.192	1.758	1.307
120	147		175	0.151	1.536	0.892
175	218		250	0.120	0.528	0.725
250	385		500	0.118	0.507	0.665
500	595		750	0.118	0.507	0.679
750	808		1000	0.127	0.531	1.578
0	39	Bore/Drill Rigs	50	0.319	1.190	2.115
50	82		120	0.098	1.032	1.184
120	149		175	0.066	1.073	0.542
175	208		250	0.058	1.051	0.526
250	349		500	0.053	1.038	0.451
500	612		750	0.048	1.072	0.360
750	919		1000	0.028	1.056	1.137
1000	2667		9999	0.106	1.056	2.173
0	9	Cement and M	15	0.370	1.943	2.320
15	25		25	0.391	1.320	2.454
0	18	Concrete/Indu	25	0.500	1.708	3.163
25	33		50	0.443	3.192	2.785
50	81		120	0.234	2.560	1.810
120	175		175	0.183	2.243	1.168
0	41	Cranes	50	0.617	0.825	1.706
50	89		120	0.166	0.749	1.404
120	148		175	0.128	0.756	1.216
175	217		250	0.090	0.754	0.930
250	336		500	0.071	0.753	0.723
500	567		750	0.059	0.750	0.597
750	938		1000	0.185	0.748	2.137
1000	1030		9999	0.064	0.752	0.691
0	43	Crawler Tracto	50	0.840	1.329	2.283
50	87		120	0.250	1.226	2.042
120	150		175	0.156	1.214	1.428
175	203		250	0.124	1.214	1.367
250	341		500	0.108	1.222	1.062
500	570		750	0.082	1.216	0.800
750	828		1000	0.120	1.219	2.045
1000	1527		9999	0.140	1.168	2.419
0	45	Crushing/Proc	50	0.578	3.931	3.091
50	85		120	0.301	2.886	1.991
120	171		175	0.238	2.528	1.291
175	250		250	0.194	0.867	1.039
250	382		500	0.190	0.831	0.957
500	602		750	0.191	0.831	0.976
750	1337		9999	0.224	0.864	2.465
0	16	Dumpers/Tend	25	0.261	0.889	1.646
0	36	Excavators	50	0.180	1.082	1.372
50	82		120	0.092	0.962	0.909

120	146		175	0.071	0.973	0.559
175	218		250	0.057	0.973	0.462
250	329		500	0.049	0.968	0.341
500	578		750	0.058	0.965	0.442
750	843		1000	0.036	0.965	0.893
1000	1569		9999	0.034	0.963	0.880
0	42	Forklifts	50	0.161	0.638	0.835
50	82		120	0.069	0.572	0.614
120	141		175	0.051	0.573	0.425
175	208		250	0.043	0.574	0.363
250	344		500	0.046	0.575	0.359
500	880		1000	0.021	0.573	0.481
0	11	Generator Set	15	0.459	2.598	3.225
15	19		25	0.520	1.784	3.297
25	33		50	0.395	2.845	2.771
50	84		120	0.215	2.481	1.896
120	153		175	0.163	2.168	1.286
175	229		250	0.125	0.746	1.045
250	363		500	0.121	0.731	0.965
500	586		750	0.122	0.731	0.984
750	1130		9999	0.149	0.765	2.309
0	39	Graders	50	0.833	1.161	2.104
50	91		120	0.308	1.103	2.346
120	148		175	0.167	1.124	1.450
175	204		250	0.121	1.113	1.406
250	293		500	0.132	1.107	1.105
500	796		1000	0.045	1.109	0.986
1000	1993		9999	0.215	1.107	2.786
0	38	Off-Highway T	50	0.300	1.302	1.741
50	75		120	0.144	1.182	1.348
120	158		175	0.092	1.174	0.777
175	214		250	0.078	1.169	0.650
250	334		500	0.059	1.165	0.401
500	574		750	0.077	1.171	0.561
750	1000		1000	0.082	1.172	1.066
1000	1726		9999	0.129	1.205	1.685
0	29	Off-Highway T	50	0.302	0.658	1.585
50	87		120	0.157	0.596	1.236
120	159		175	0.094	0.602	0.643
175	211		250	0.083	0.601	0.556
250	372		500	0.075	0.609	0.506
500	656		750	0.105	0.607	0.833
750	897		1000	0.085	0.606	1.353
1000	1764		9999	0.071	0.613	1.204
0	38	Other Construc	50	0.376	1.339	1.909
50	82		120	0.176	1.194	1.574
120	152		175	0.119	1.188	1.121
175	217		250	0.088	1.203	0.937
250	357		500	0.078	1.205	0.753
500	598		750	0.072	1.199	0.751
750	830		1000	0.048	1.201	1.092
1000	1127		9999	0.072	1.163	1.350

0	35	Other General	50	0.216	0.972	1.364
50	73		120	0.110	0.869	0.999
120	149		175	0.072	0.872	0.550
175	209		250	0.065	0.875	0.523
250	355		500	0.059	0.874	0.429
500	592		750	0.040	0.875	0.214
750	885		1000	0.069	0.872	1.352
1000	2000		9999	0.030	0.872	0.802
0	36	Other Material	50	0.418	1.196	1.852
50	93		120	0.093	1.081	0.908
120	145		175	0.090	1.078	0.699
175	218		250	0.086	1.076	0.792
250	331		500	0.090	1.074	0.739
500	565		750	0.067	1.078	0.505
750	923		1000	0.045	1.078	0.956
1000	1050		9999	0.023	1.078	0.896
0	39	Pavers	50	0.438	1.428	1.780
50	80		120	0.152	1.274	1.423
120	158		175	0.087	1.282	0.812
175	213		250	0.056	1.281	0.669
250	327		500	0.066	1.263	0.736
500	750		750	0.024	1.280	0.108
0	35	Paving Equipn	50	0.201	1.295	1.340
50	89		120	0.103	1.177	1.007
120	148		175	0.076	1.170	0.679
175	216		250	0.065	1.174	0.669
250	339		500	0.058	1.166	0.555
500	605		750	0.047	1.172	0.456
750	842		1000	0.040	1.175	0.837
0	8	Plate Compact	15	0.284	1.492	1.781
0	13	Pressure Wash	15	0.186	1.053	1.307
15	19		25	0.211	0.723	1.337
25	38		50	0.113	0.983	1.079
50	64		120	0.069	0.960	0.737
0	8	Pumps	15	0.518	2.598	3.236
15	21		25	0.541	1.784	3.297
25	37		50	0.434	2.986	2.808
50	84		120	0.229	2.519	1.922
120	151		175	0.175	2.201	1.307
175	217		250	0.135	0.757	1.063
250	372		500	0.131	0.739	0.978
500	615		750	0.132	0.739	0.998
750	1460		9999	0.159	0.775	2.333
0	36	Rollers	50	0.259	1.180	1.471
50	87		120	0.113	1.064	1.127
120	144		175	0.059	1.059	0.557
175	213		250	0.074	1.063	0.815
250	335		500	0.083	1.073	0.859
500	521		750	0.038	1.061	0.267
0	47	Rough Terrain	50	0.290	1.271	1.549
50	96		120	0.063	1.146	0.797
120	130		175	0.047	1.142	0.490

175	208		250	0.049	1.145	0.593
250	374		500	0.029	1.130	0.224
500	625		750	0.047	1.143	0.540
0	42	Rubber Tired L	50	0.219	1.066	1.437
50	82		120	0.305	0.979	2.343
120	150		175	0.243	0.971	2.236
175	211		250	0.163	0.972	1.617
250	354		500	0.185	0.982	1.743
500	584		750	0.175	0.969	2.108
0	42	Rubber Tired L	50	0.397	0.988	1.636
50	86		120	0.156	0.879	1.271
120	150		175	0.102	0.887	0.794
175	206		250	0.079	0.885	0.745
250	320		500	0.082	0.883	0.675
500	600		750	0.086	0.875	0.697
750	837		1000	0.073	0.890	1.276
1000	1521		9999	0.090	0.884	1.503
0	36	Scrapers	50	1.548	1.260	3.076
50	84		120	0.318	1.165	2.907
120	166		175	0.182	1.154	1.678
175	225		250	0.160	1.132	1.584
250	381		500	0.128	1.141	1.286
500	565		750	0.112	1.136	1.151
750	950		1000	0.593	1.138	6.460
1000	1923		9999	0.134	1.163	2.204
0	6	Signal Boards	15	0.542	2.845	3.397
15	37		50	0.471	3.340	2.938
50	82		120	0.246	2.714	1.929
120	158		175	0.190	2.376	1.250
175	216		250	0.184	0.985	1.219
0	43	Skid Steer Loa	50	0.136	1.378	1.242
50	71		120	0.059	1.235	0.751
120	153		175	0.049	1.225	0.455
175	201		250	0.042	1.205	0.494
250	277		500	0.023	1.201	0.094
500	530		750	0.070	1.233	0.904
750	1000		1000	0.027	1.233	0.840
0	36	Surfacing Equi	50	0.138	0.851	1.183
50	89		120	0.085	0.753	0.922
120	151		175	0.071	0.746	0.740
175	216		250	0.060	0.757	0.754
250	362		500	0.041	0.747	0.445
500	615		750	0.032	0.750	0.326
750	814		1000	0.047	0.748	0.991
1000	1141		9999	0.027	0.737	0.676
0	36	Sweepers/Scra	50	0.362	1.544	1.880
50	78		120	0.167	1.393	1.497
120	159		175	0.139	1.390	1.188
175	204		250	0.076	1.381	0.734
250	303		500	0.096	1.387	1.084
500	848		1000	0.024	1.387	1.028
0	38	Tractors/Load	50	0.239	0.982	1.421



50	83		120	0.092	0.911	0.894
120	144		175	0.071	0.896	0.560
175	204		250	0.065	0.898	0.585
250	320		500	0.059	0.898	0.460
500	575		750	0.090	0.892	0.891
750	871		1000	0.050	0.910	1.083
1000	2006		9999	0.065	0.904	1.167
0	40	Trenchers	50	0.337	1.633	1.989
50	82		120	0.265	1.473	2.362
120	144		175	0.189	1.449	1.838
175	218		250	0.172	1.468	1.878
250	359		500	0.104	1.461	1.008
500	619		750	0.032	1.470	0.152
750	860		1000	0.617	1.462	6.728
0	11	Welders	15	0.315	1.580	1.968
15	20		25	0.329	1.085	2.005
25	46		50	0.325	2.083	1.780
50	70		120	0.167	1.607	1.210
120	174		175	0.130	1.404	0.826
175	211		250	0.102	0.483	0.672
250	297		500	0.100	0.466	0.616
0	29	Water Trucks	50	0.302	0.658	1.585
50	87		120	0.157	0.596	1.236
120	159		175	0.094	0.602	0.643
175	211		250	0.083	0.601	0.556
250	372		500	0.075	0.609	0.506
500	656		750	0.105	0.607	0.833
750	897		1000	0.085	0.606	1.353
1000	1764		9999	0.071	0.613	1.204

g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
SOX	PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.002	0.076	179.282	5.61	39.91	66.33	0.08	3.51	8,267
0.002	0.077	161.199	6.99	57.61	100.09	0.11	5.73	11,932
0.002	0.053	161.168	9.82	101.52	161.87	0.20	6.94	21,028
0.002	0.187	161.179	73.44	163.42	759.27	0.32	39.21	33,848
0.002	0.069	161.179	56.81	295.70	829.35	0.58	26.32	61,248
0.004	0.194	272.784	5.76	22.25	34.37	0.05	2.33	3,273
0.003	0.161	272.784	12.70	34.83	60.22	0.08	3.87	6,547
0.004	0.287	272.784	44.47	118.07	104.03	0.13	10.61	10,093
0.003	0.281	272.784	39.50	148.20	238.28	0.25	21.89	21,277
0.003	0.155	272.784	50.29	229.20	399.08	0.45	22.75	40,099
0.003	0.077	272.784	47.37	136.67	543.54	0.67	16.84	59,467
0.003	0.072	272.784	75.96	255.43	848.33	1.03	27.66	105,022
0.003	0.073	272.784	119.20	394.76	1,352.18	1.63	43.54	162,306
0.003	0.087	272.784	201.10	690.07	2,422.09	2.22	70.69	220,409
0.003	0.204	303.000	18.11	47.81	107.60	0.11	8.02	11,900
0.002	0.152	253.496	16.00	83.85	194.80	0.20	12.48	20,870
0.003	0.108	267.706	26.35	159.75	337.97	0.38	16.07	39,764
0.003	0.067	262.328	27.46	218.95	450.55	0.52	13.94	54,500
0.002	0.063	257.317	41.89	360.97	651.44	0.86	21.84	89,851
0.003	0.047	266.917	52.97	656.22	856.10	1.56	28.85	163,343
0.003	0.052	262.691	85.44	969.87	2,022.40	2.31	47.43	241,413
0.003	0.050	262.792	215.70	2,815.34	5,626.50	6.69	132.79	700,778
0.005	0.117	318.248	3.40	17.50	21.53	0.04	1.06	2,864
0.004	0.164	318.248	13.29	38.59	70.18	0.10	4.10	7,956
0.005	0.127	414.859	9.02	30.75	57.14	0.09	2.28	7,467
0.005	0.368	414.859	47.50	136.68	134.68	0.18	12.15	13,690
0.005	0.358	414.859	52.41	221.19	345.75	0.39	29.01	33,604
0.005	0.199	414.859	76.49	395.35	658.11	0.82	34.81	72,600
0.002	0.179	165.362	26.51	33.55	72.21	0.06	7.29	6,718
0.001	0.229	149.938	34.92	66.60	275.05	0.13	20.38	13,336
0.001	0.139	151.570	37.17	111.93	380.96	0.21	20.48	22,415
0.001	0.110	150.984	45.30	163.61	518.99	0.31	23.79	32,764
0.001	0.081	150.597	52.16	252.76	657.42	0.48	27.22	50,617
0.001	0.044	150.443	46.63	426.11	728.17	0.81	24.79	85,330
0.001	0.165	149.776	293.24	701.26	3,130.29	1.34	155.00	140,430
0.001	0.045	150.667	103.77	774.95	1,924.13	1.48	46.33	155,187
0.002	0.330	244.877	50.14	56.41	118.72	0.10	14.04	10,410
0.002	0.271	226.544	34.92	106.62	286.01	0.19	23.56	19,677
0.002	0.164	224.201	43.01	181.67	456.12	0.32	24.49	33,528
0.002	0.107	224.956	42.06	247.25	560.07	0.44	21.74	45,631
0.002	0.097	226.028	64.51	417.26	863.49	0.74	33.19	77,006
0.002	0.081	225.034	91.50	695.17	1,284.85	1.23	46.09	128,295
0.002	0.092	225.634	173.60	1,012.52	2,608.21	1.78	76.12	186,863

0.002	0.066	215.490	223.73	1,782.39	3,902.32	3.14	100.90	328,945
0.006	0.466	443.274	87.46	236.48	205.99	0.26	20.96	19,947
0.005	0.455	443.274	69.20	264.26	415.92	0.44	38.65	37,678
0.005	0.251	443.274	94.76	437.58	741.40	0.85	42.94	75,800
0.005	0.124	443.274	88.56	253.35	993.23	1.25	30.94	110,818
0.004	0.115	443.274	123.90	405.85	1,335.42	1.66	44.03	169,331
0.004	0.117	443.274	197.48	630.13	2,188.84	2.68	70.64	266,851
0.004	0.142	443.274	549.06	1,831.14	6,462.48	5.96	190.51	592,657
0.003	0.088	215.954	4.51	14.69	27.82	0.04	1.42	3,455
0.002	0.157	222.523	12.22	38.72	70.90	0.08	5.63	7,953
0.002	0.166	197.502	18.53	78.63	175.87	0.15	13.54	16,151
0.002	0.105	199.803	26.22	142.06	300.56	0.28	15.34	29,179
0.002	0.064	199.956	29.54	212.68	444.35	0.42	14.08	43,685
0.002	0.050	199.014	34.05	318.42	509.21	0.62	16.48	65,405
0.002	0.055	198.166	64.86	557.58	968.90	1.09	32.05	114,528
0.002	0.084	198.960	146.13	816.45	2,197.64	1.60	70.70	167,699
0.002	0.050	197.811	160.69	1,511.16	2,710.18	2.96	78.07	310,393
0.001	0.145	117.014	21.00	27.04	53.51	0.05	6.14	4,963
0.001	0.125	105.000	14.95	47.13	123.02	0.08	10.27	8,649
0.001	0.078	105.128	19.10	80.94	202.19	0.14	11.00	14,853
0.001	0.077	105.400	30.33	119.55	340.65	0.21	15.93	21,939
0.001	0.074	105.464	48.31	197.53	542.77	0.35	25.52	36,250
0.001	0.175	105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
0.007	0.249	420.542	7.01	31.45	47.58	0.07	2.74	4,626
0.005	0.226	420.542	12.38	42.52	73.50	0.10	4.30	7,990
0.005	0.344	420.542	42.23	122.25	133.67	0.18	11.34	13,878
0.005	0.339	420.542	53.42	223.73	362.21	0.41	28.50	35,326
0.005	0.187	420.542	64.61	335.23	585.90	0.72	28.66	64,343
0.005	0.099	420.542	60.83	201.82	805.33	1.08	22.58	96,304
0.004	0.093	420.542	86.34	340.25	1,152.54	1.50	33.61	152,657
0.004	0.094	420.542	144.28	549.27	1,916.78	2.48	55.20	246,438
0.004	0.122	420.542	384.20	1,355.65	4,878.20	4.78	137.81	475,212
0.002	0.354	223.016	51.94	45.32	104.84	0.08	13.88	8,734
0.002	0.347	213.456	50.70	100.79	382.62	0.19	31.54	19,424
0.002	0.203	218.650	54.40	167.86	537.96	0.31	29.99	32,349
0.002	0.076	216.170	33.00	229.22	482.49	0.42	15.48	44,175
0.002	0.059	214.135	37.44	325.76	456.79	0.60	17.38	62,778
0.002	0.132	213.737	240.35	882.83	3,007.57	1.62	105.01	170,135
0.002	0.079	213.348	358.68	2,206.16	5,293.99	4.06	158.07	425,161
0.002	0.261	252.603	30.23	48.94	95.59	0.09	9.81	9,513
0.002	0.256	230.042	27.31	88.20	229.53	0.16	19.08	17,145
0.002	0.130	228.327	34.72	185.67	393.02	0.34	20.62	36,093
0.002	0.098	227.046	42.30	249.76	583.76	0.46	20.94	48,552
0.002	0.077	227.639	50.47	391.63	711.10	0.73	25.67	76,131
0.002	0.074	228.674	83.14	674.68	1,201.17	1.25	42.18	131,153
0.002	0.272	227.753	473.17	1,171.61	5,344.58	2.17	271.92	227,753
0.002	0.158	221.434	605.98	1,966.38	7,253.93	3.65	272.93	382,251
0.002	0.232	214.915	19.37	18.96	64.47	0.06	6.75	6,263
0.002	0.239	196.940	32.18	51.91	248.17	0.16	20.77	17,146
0.002	0.135	198.963	37.58	95.71	368.13	0.30	21.45	31,613
0.002	0.106	198.509	45.79	126.82	518.83	0.40	22.30	41,888
0.002	0.080	201.274	65.78	226.95	764.72	0.72	29.90	74,958

0.002	0.107	201.915	145.68	400.98	1,642.45	1.26	70.23	132,440
0.002	0.081	200.276	168.48	544.05	2,434.12	1.72	73.09	179,693
0.002	0.080	202.691	325.16	1,082.64	4,421.51	3.41	141.17	357,585
0.002	0.209	243.375	21.50	50.85	88.12	0.09	7.94	9,250
0.002	0.226	216.419	27.14	97.04	235.69	0.17	18.41	17,652
0.002	0.151	216.186	40.71	181.23	438.10	0.31	22.98	32,966
0.002	0.108	218.994	45.01	261.14	604.53	0.45	23.33	47,501
0.002	0.086	220.048	59.82	431.70	803.96	0.75	30.52	78,527
0.002	0.064	217.515	75.38	714.70	1,147.85	1.24	38.16	130,003
0.002	0.062	216.921	104.61	989.98	1,825.16	1.72	51.19	180,078
0.002	0.090	211.725	211.24	1,311.40	3,085.38	2.28	101.82	238,544
0.002	0.195	199.186	19.99	34.13	68.52	0.07	6.83	6,992
0.002	0.209	177.921	22.18	63.57	180.44	0.12	15.31	13,022
0.002	0.119	178.621	30.73	130.06	328.47	0.25	17.78	26,642
0.002	0.105	179.141	42.41	182.83	510.31	0.36	22.03	37,451
0.002	0.071	179.029	50.76	310.02	654.29	0.61	25.07	63,504
0.002	0.055	179.232	67.38	517.60	949.72	1.01	32.53	106,023
0.002	0.054	178.698	103.85	772.06	1,887.17	1.51	47.63	158,148
0.002	0.036	178.698	131.12	1,744.77	2,923.54	3.41	72.27	357,397
0.002	0.245	229.351	27.82	42.74	83.72	0.08	8.76	8,198
0.002	0.204	207.401	26.46	100.73	234.50	0.18	19.00	19,322
0.002	0.141	206.802	34.82	155.86	366.27	0.29	20.38	29,897
0.002	0.115	206.479	49.06	234.96	606.23	0.43	25.04	45,071
0.002	0.085	205.960	54.18	355.79	694.57	0.65	28.10	68,248
0.002	0.044	206.729	47.44	608.45	756.20	1.11	24.71	116,716
0.002	0.043	206.729	77.98	994.72	1,652.91	1.82	39.59	190,811
0.002	0.042	206.729	82.89	1,131.59	1,824.70	2.07	44.19	217,066
0.002	0.253	242.508	32.27	55.18	94.03	0.09	9.77	9,367
0.002	0.217	215.774	25.78	101.16	220.61	0.16	17.30	17,172
0.002	0.137	217.637	39.15	202.75	423.14	0.33	21.63	34,416
0.002	0.047	218.215	19.72	274.10	390.87	0.44	10.10	46,526
0.002	0.053	214.495	30.85	413.69	489.57	0.67	17.24	70,222
0.002	0.042	217.241	49.01	959.87	750.85	1.56	31.43	162,931
0.002	0.167	204.852	15.06	45.07	66.07	0.07	5.81	7,132
0.002	0.194	186.313	25.19	104.30	221.54	0.16	17.19	16,507
0.002	0.103	185.295	26.21	173.76	312.64	0.26	15.30	27,499
0.002	0.076	185.647	31.98	252.98	445.17	0.38	16.50	40,038
0.002	0.066	184.805	43.42	395.57	612.15	0.60	22.36	62,604
0.002	0.040	186.137	56.04	711.56	946.07	1.08	24.43	112,613
0.002	0.076	185.931	152.39	989.20	2,224.84	1.50	64.22	156,554
0.004	0.071	244.369	2.28	11.94	14.25	0.03	0.57	1,955
0.003	0.101	170.490	3.36	15.07	22.80	0.03	1.31	2,216
0.002	0.092	170.490	5.02	17.24	29.80	0.04	1.74	3,239
0.002	0.120	170.490	15.40	48.13	60.37	0.08	4.57	6,479
0.002	0.120	170.490	14.70	65.86	106.75	0.13	7.65	10,911
0.007	0.299	420.542	5.92	22.87	35.32	0.05	2.39	3,364
0.005	0.248	420.542	17.13	46.99	81.24	0.11	5.22	8,831
0.005	0.359	420.542	50.83	144.29	151.51	0.20	13.30	15,560
0.005	0.354	420.542	55.38	227.26	367.78	0.41	29.76	35,326
0.005	0.196	420.542	66.29	335.94	587.21	0.71	29.53	63,502
0.005	0.103	420.542	60.16	194.68	775.11	1.03	22.25	91,258
0.004	0.096	420.542	92.44	358.51	1,195.21	1.54	35.68	156,442

0.004	0.098	420.542	157.65	592.69	2,035.84	2.60	60.01	258,633
0.004	0.124	420.542	507.60	1,796.93	6,375.03	6.17	181.19	613,991
0.002	0.192	218.696	19.12	42.13	74.54	0.07	6.85	7,803
0.002	0.200	197.212	26.49	92.49	230.94	0.16	17.39	17,130
0.002	0.096	196.093	23.62	152.22	290.40	0.27	13.77	28,194
0.002	0.090	196.849	39.11	226.64	531.45	0.40	19.28	41,978
0.002	0.104	198.569	66.80	359.01	837.64	0.63	34.90	66,496
0.002	0.118	196.512	124.03	552.23	1,667.30	0.98	61.43	102,285
0.002	0.191	234.017	24.09	60.18	104.42	0.11	9.05	11,065
0.002	0.137	210.534	18.06	110.29	204.89	0.19	13.15	20,280
0.002	0.076	210.056	15.41	148.04	228.41	0.26	9.83	27,221
0.002	0.128	211.264	51.04	239.33	595.52	0.42	26.68	44,008
0.002	0.069	207.954	52.17	422.84	876.85	0.74	25.72	77,752
0.002	0.318	210.233	380.43	714.57	3,768.10	1.25	198.74	131,396
0.002	0.344	226.562	51.17	44.07	109.24	0.09	14.32	9,422
0.002	0.333	208.452	40.90	79.56	306.48	0.16	27.13	17,008
0.002	0.221	207.422	59.00	145.23	580.57	0.30	33.09	31,048
0.002	0.157	208.076	63.27	205.35	689.92	0.42	33.19	43,900
0.002	0.159	210.206	108.70	348.13	1,201.44	0.71	56.19	74,424
0.002	0.108	207.197	129.13	566.11	1,727.21	1.16	63.19	121,024
0.002	0.262	210.273	36.23	41.22	95.10	0.08	10.92	8,768
0.002	0.243	187.303	30.53	75.86	238.63	0.15	20.91	16,136
0.002	0.137	188.926	36.53	133.22	368.79	0.27	20.60	28,338
0.002	0.072	188.399	32.25	182.37	436.40	0.37	14.75	38,792
0.002	0.076	188.065	52.42	282.64	646.23	0.57	24.40	60,122
0.002	0.073	182.974	92.81	516.52	1,103.47	1.05	43.74	109,872
0.002	0.070	188.742	129.44	742.50	2,038.31	1.51	58.70	157,942
0.002	0.064	187.956	226.23	1,343.95	3,453.38	2.73	97.36	285,882
0.003	0.422	279.274	56.45	45.54	116.16	0.10	15.24	10,094
0.002	0.250	258.681	30.30	98.42	289.31	0.21	21.11	21,814
0.002	0.216	256.115	64.51	192.00	684.14	0.41	35.94	42,557
0.002	0.207	250.582	89.25	254.34	1,012.74	0.54	46.67	56,374
0.002	0.130	252.665	96.51	434.72	1,222.06	0.92	49.42	96,354
0.002	0.101	252.705	112.21	644.11	1,498.92	1.36	57.08	142,766
0.002	0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.002	0.127	257.796	471.47	2,236.99	6,657.18	4.73	245.15	495,821
0.007	0.132	466.006	3.25	17.07	20.38	0.04	0.79	2,796
0.006	0.397	443.274	57.64	162.61	161.53	0.21	14.68	16,401
0.005	0.389	443.274	58.26	238.84	379.04	0.43	31.91	36,348
0.005	0.215	443.274	75.41	379.32	647.15	0.79	34.01	70,037
0.006	0.134	535.623	79.17	249.86	979.66	1.30	28.97	115,694
0.002	0.143	215.329	14.53	59.89	82.17	0.09	6.21	9,360
0.002	0.112	192.955	10.13	87.08	123.07	0.13	7.88	13,610
0.002	0.089	191.436	22.96	187.31	280.56	0.28	13.59	29,275
0.002	0.084	190.128	30.63	243.95	414.58	0.36	16.90	38,127
0.002	0.059	187.666	31.62	332.20	466.06	0.50	16.22	51,921
0.002	0.036	192.714	26.39	653.51	464.96	0.98	18.86	102,138
0.002	0.109	192.714	244.91	1,233.03	3,032.28	1.84	108.88	192,714
0.002	0.142	177.866	14.19	30.14	60.64	0.06	5.08	6,344
0.002	0.128	157.536	16.69	66.38	159.09	0.13	11.39	13,970
0.001	0.095	157.072	26.16	112.67	295.31	0.23	14.36	23,714
0.002	0.062	159.427	27.60	163.67	405.62	0.33	13.50	34,446

0.001	0.040	156.819	27.87	269.99	459.16	0.54	14.67	56,824
0.002	0.033	157.429	34.29	460.08	641.13	0.92	20.14	96,831
0.002	0.049	158.233	89.91	612.20	1,546.83	1.23	39.51	128,847
0.001	0.051	155.194	128.69	841.35	2,062.52	1.69	57.94	177,076
0.003	0.283	265.154	31.05	54.93	94.85	0.09	10.07	9,436
0.002	0.300	239.305	33.51	108.00	265.00	0.18	23.26	18,552
0.002	0.254	238.803	72.93	221.69	723.42	0.36	40.52	38,082
0.002	0.131	237.291	51.86	282.36	657.09	0.46	26.68	48,504
0.002	0.116	238.264	63.41	419.57	823.06	0.69	35.18	72,075
0.002	0.044	238.264	52.56	1,176.17	1,532.54	1.93	37.37	202,048
0.002	0.198	209.787	22.07	37.63	78.65	0.08	7.58	8,036
0.002	0.180	195.638	20.50	75.72	185.16	0.15	14.91	16,170
0.002	0.103	191.864	25.75	129.33	291.09	0.26	14.82	27,616
0.002	0.064	192.212	27.04	183.83	404.82	0.37	13.01	39,253
0.002	0.062	193.351	40.62	289.88	584.96	0.59	19.76	61,899
0.002	0.056	190.031	64.39	511.38	911.77	1.04	32.35	109,195
0.002	0.029	194.746	64.54	794.74	1,391.74	1.62	25.60	169,702
0.002	0.069	193.002	279.79	1,812.80	4,404.49	3.70	138.78	387,090
0.003	0.257	293.851	27.16	65.03	110.63	0.11	10.24	11,689
0.003	0.303	265.044	38.17	121.01	317.27	0.21	24.90	21,749
0.002	0.219	260.391	57.70	208.44	611.44	0.36	31.52	37,463
0.003	0.147	264.146	63.93	321.01	817.54	0.55	32.18	57,695
0.003	0.084	262.663	58.47	523.94	826.09	0.90	30.29	94,169
0.003	0.035	264.288	37.20	910.58	637.26	1.56	21.59	163,660
0.003	0.295	262.792	506.75	1,257.44	5,638.87	2.16	253.68	226,001
0.004	0.182	255.735	4.95	19.12	29.53	0.04	2.00	2,813
0.003	0.151	255.735	9.92	27.21	47.05	0.06	3.02	5,115
0.003	0.251	255.735	47.13	127.36	118.76	0.15	11.54	11,764
0.003	0.246	255.735	31.35	121.17	195.52	0.21	17.20	17,901
0.003	0.136	255.735	52.37	247.33	431.86	0.50	23.59	44,498
0.003	0.069	255.735	40.33	121.08	481.04	0.61	14.61	53,960
0.003	0.064	255.735	51.20	181.65	602.07	0.75	19.12	75,953
0.002	0.232	214.915	19.368	18.961	64.466	0.060	6.749	6262.690
0.002	0.239	196.940	32.180	51.912	248.172	0.164	20.774	17146.088
0.002	0.135	198.963	37.581	95.713	368.131	0.302	21.452	31613.067
0.002	0.106	198.509	45.794	126.823	518.829	0.400	22.302	41888.392
0.002	0.080	201.274	65.781	226.947	764.719	0.716	29.895	74958.110
0.002	0.107	201.915	145.685	400.980	1642.455	1.265	70.232	132439.629
0.002	0.081	200.276	168.477	544.048	2434.121	1.716	73.092	179693.374
0.002	0.080	202.691	325.158	1082.641	4421.507	3.415	141.172	357585.199

g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
SOX	PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.002	0.007	179.282	2.42	39.91	41.17	0.08	0.33	8,267
0.002	0.008	161.199	2.40	57.61	35.32	0.11	0.61	11,932

0.002	0.007	161.168	3.58	101.52	22.98	0.20	0.97	21,028
0.002	0.003	161.179	3.96	163.42	16.90	0.32	0.58	33,848
0.002	0.003	161.179	9.63	295.70	75.49	0.58	1.08	61,248
0.004	0.095	272.784	4.03	20.22	25.19	0.05	1.13	3,273
0.003	0.090	272.784	8.42	27.77	51.32	0.08	2.16	6,547
0.004	0.081	272.784	13.79	87.74	71.74	0.13	2.98	10,093
0.003	0.073	272.784	14.98	137.15	101.93	0.25	5.73	21,277
0.003	0.046	272.784	22.21	225.78	131.11	0.45	6.70	40,099
0.003	0.023	272.784	26.23	115.12	158.05	0.67	5.11	59,467
0.003	0.023	272.784	45.37	195.30	255.88	1.03	8.75	105,022
0.003	0.023	272.784	70.31	301.82	403.72	1.63	13.68	162,306
0.003	0.035	272.784	102.47	428.86	1,275.30	2.22	27.88	220,409
0.003	0.113	296.155	12.52	46.73	83.05	0.11	4.46	11,631
0.002	0.051	256.757	8.11	84.92	97.49	0.20	4.20	21,139
0.003	0.024	267.018	9.79	159.34	80.44	0.38	3.57	39,662
0.002	0.017	261.484	12.06	218.25	109.25	0.52	3.54	54,324
0.002	0.015	258.330	18.56	362.39	157.50	0.86	5.30	90,204
0.003	0.013	266.781	29.22	655.89	220.38	1.56	8.11	163,260
0.003	0.009	262.773	25.44	970.17	1,044.80	2.31	8.22	241,488
0.003	0.055	262.792	281.86	2,815.34	5,795.84	6.69	147.03	700,778
0.005	0.091	318.248	3.33	17.49	20.88	0.04	0.82	2,864
0.004	0.097	318.248	9.77	33.00	61.36	0.10	2.42	7,956
0.005	0.118	414.859	9.01	30.75	56.93	0.09	2.13	7,467
0.005	0.099	414.859	14.62	105.34	91.90	0.18	3.25	13,690
0.005	0.091	414.859	18.96	207.38	146.60	0.39	7.34	33,604
0.005	0.057	414.859	32.07	392.55	204.41	0.82	9.94	72,600
0.002	0.175	165.291	25.07	33.54	69.32	0.06	7.11	6,716
0.001	0.093	149.976	14.80	66.61	124.91	0.13	8.27	13,340
0.001	0.064	151.478	18.87	111.86	179.87	0.21	9.53	22,401
0.001	0.039	150.961	19.46	163.58	201.89	0.31	8.43	32,758
0.001	0.029	150.744	23.95	253.01	243.10	0.48	9.83	50,666
0.001	0.024	150.092	33.35	425.11	338.67	0.81	13.74	85,130
0.001	0.095	149.743	173.35	701.11	2,003.73	1.34	88.75	140,399
0.001	0.018	150.667	65.42	774.95	711.76	1.48	18.75	155,187
0.002	0.226	245.201	35.73	56.48	97.07	0.10	9.59	10,423
0.002	0.160	226.198	21.75	106.46	177.36	0.19	13.89	19,647
0.002	0.079	224.119	23.30	181.60	213.53	0.32	11.88	33,515
0.002	0.053	224.045	25.15	246.25	277.24	0.43	10.75	45,446
0.002	0.044	225.464	36.78	416.22	361.77	0.73	14.85	76,814
0.002	0.030	224.475	46.98	693.44	456.33	1.22	16.97	127,976
0.002	0.051	225.014	99.71	1,009.73	1,693.80	1.78	42.04	186,349
0.002	0.062	215.490	214.36	1,782.39	3,693.04	3.14	94.18	328,945
0.006	0.114	443.274	26.00	176.90	139.09	0.26	5.15	19,947
0.005	0.103	443.274	25.59	245.33	169.25	0.44	8.77	37,678
0.005	0.065	443.274	40.65	432.22	220.71	0.85	11.11	75,800
0.005	0.034	443.274	48.39	216.76	259.63	1.25	8.44	110,818
0.004	0.033	443.274	72.71	317.31	365.72	1.66	12.52	169,331
0.004	0.033	443.274	114.85	500.28	587.66	2.68	19.80	266,851
0.004	0.052	443.274	300.06	1,155.48	3,296.34	5.96	69.01	592,657
0.003	0.062	215.954	4.17	14.23	26.34	0.04	0.99	3,455
0.002	0.053	222.304	6.43	38.68	49.05	0.08	1.90	7,945
0.002	0.044	197.650	7.52	78.69	74.35	0.15	3.63	16,163

0.002	0.027	199.816	10.40	142.07	81.56	0.28	3.99	29,181
0.002	0.015	199.789	12.40	212.50	100.91	0.42	3.23	43,648
0.002	0.012	198.806	16.02	318.09	112.09	0.62	3.79	65,336
0.002	0.017	198.295	33.24	557.95	255.73	1.09	9.54	114,603
0.002	0.009	198.242	30.37	813.50	752.70	1.60	7.65	167,093
0.002	0.009	197.811	53.54	1,511.16	1,381.05	2.96	13.80	310,393
0.001	0.047	117.014	6.84	27.04	35.39	0.05	1.98	4,963
0.001	0.038	105.000	5.66	47.13	50.61	0.08	3.13	8,649
0.001	0.022	105.128	7.24	80.94	59.98	0.14	3.14	14,853
0.001	0.014	105.400	8.92	119.55	75.61	0.21	2.88	21,939
0.001	0.014	105.464	15.90	197.53	123.51	0.35	4.75	36,250
0.001	0.004	105.117	18.47	504.07	423.48	0.88	3.85	92,503
0.007	0.139	420.542	5.05	28.58	35.48	0.07	1.53	4,626
0.005	0.136	420.542	9.88	33.89	62.64	0.10	2.59	7,990
0.005	0.098	420.542	13.03	93.87	91.45	0.18	3.24	13,878
0.005	0.093	420.542	18.02	208.44	159.23	0.41	7.80	35,326
0.005	0.056	420.542	24.88	331.72	196.75	0.72	8.60	64,343
0.005	0.030	420.542	28.68	170.79	239.23	1.08	6.93	96,304
0.004	0.029	420.542	43.92	265.31	350.12	1.50	10.65	152,657
0.004	0.030	420.542	71.53	428.30	576.76	2.48	17.39	246,438
0.004	0.045	420.542	168.51	864.77	2,608.76	4.78	51.09	475,212
0.002	0.224	223.683	32.61	45.45	82.39	0.08	8.79	8,760
0.002	0.178	212.484	27.99	100.33	213.48	0.18	16.20	19,335
0.002	0.080	216.639	24.67	166.31	214.52	0.31	11.81	32,051
0.002	0.046	214.584	24.79	227.54	287.39	0.42	9.31	43,851
0.002	0.043	213.274	38.70	324.44	324.05	0.60	12.59	62,525
0.002	0.009	213.737	36.14	882.83	784.66	1.62	7.25	170,135
0.002	0.087	213.348	428.46	2,206.16	5,550.99	4.06	173.89	425,161
0.002	0.089	253.015	11.30	49.02	65.57	0.09	3.34	9,529
0.002	0.081	229.698	10.74	88.06	100.46	0.16	6.07	17,119
0.002	0.037	228.207	14.48	185.57	122.87	0.34	5.88	36,074
0.002	0.023	227.169	16.67	249.90	138.90	0.46	4.93	48,578
0.002	0.014	226.558	19.87	389.77	134.27	0.72	4.66	75,769
0.002	0.022	227.694	43.90	671.78	321.88	1.25	12.69	130,590
0.002	0.029	227.753	81.85	1,171.61	1,066.47	2.17	29.16	227,753
0.002	0.045	234.192	222.74	2,079.67	2,907.94	3.86	78.18	404,273
0.002	0.090	217.468	8.81	19.19	46.18	0.06	2.63	6,337
0.002	0.072	196.847	13.67	51.89	107.64	0.16	6.31	17,138
0.002	0.031	198.976	14.97	95.72	102.11	0.30	4.90	31,615
0.002	0.023	198.618	17.45	126.89	117.31	0.40	4.75	41,911
0.002	0.018	200.989	27.84	226.62	188.35	0.71	6.81	74,852
0.002	0.032	200.446	68.89	398.06	546.46	1.26	21.14	131,476
0.002	0.028	200.061	76.63	543.47	1,214.27	1.71	25.32	179,501
0.002	0.022	202.569	124.99	1,081.99	2,123.98	3.41	38.22	357,369
0.002	0.134	243.604	14.31	50.90	72.54	0.09	5.08	9,259
0.002	0.108	217.211	14.39	97.40	128.41	0.17	8.77	17,716
0.002	0.058	216.092	18.13	181.15	170.92	0.31	8.90	32,952
0.002	0.035	218.760	19.19	260.86	203.18	0.45	7.62	47,450
0.002	0.029	219.142	27.99	429.93	268.65	0.75	10.20	78,203
0.002	0.025	218.123	43.07	716.69	448.86	1.24	14.79	130,367
0.002	0.018	218.388	39.48	996.68	906.88	1.73	15.05	181,296
0.002	0.028	211.491	81.54	1,309.95	1,521.44	2.28	31.09	238,280



0.002	0.066	199.186	7.57	34.13	47.89	0.07	2.33	6,992
0.002	0.058	177.921	8.05	63.57	73.13	0.12	4.21	13,022
0.002	0.027	178.621	10.69	130.06	82.02	0.25	4.09	26,642
0.002	0.017	179.141	13.50	182.83	109.33	0.36	3.65	37,451
0.002	0.015	179.029	20.80	310.02	152.26	0.61	5.22	63,504
0.002	0.008	179.232	23.39	517.60	126.48	1.01	4.57	106,023
0.002	0.027	178.698	60.97	772.06	1,196.46	1.51	24.12	158,148
0.002	0.007	178.698	59.09	1,744.77	1,603.42	3.41	13.88	357,397
0.002	0.134	229.351	14.95	42.74	66.19	0.08	4.81	8,198
0.002	0.041	207.401	8.66	100.73	84.62	0.18	3.82	19,322
0.002	0.038	206.802	12.97	155.86	101.09	0.29	5.48	29,897
0.002	0.027	206.479	18.69	234.96	172.89	0.43	5.96	45,071
0.002	0.031	205.960	29.82	355.79	244.98	0.65	10.23	68,248
0.002	0.022	206.729	37.82	608.45	285.32	1.11	12.31	116,716
0.002	0.009	206.729	41.46	994.72	882.48	1.82	8.20	190,811
0.002	0.007	206.729	23.63	1,131.59	941.17	2.07	7.45	217,066
0.002	0.124	242.463	16.91	55.17	68.75	0.09	4.79	9,365
0.002	0.094	216.334	12.08	101.43	113.28	0.16	7.48	17,217
0.002	0.038	217.546	13.70	202.67	128.43	0.33	6.04	34,402
0.002	0.020	217.495	12.02	273.19	142.65	0.44	4.16	46,372
0.002	0.026	214.457	21.60	413.62	240.85	0.67	8.38	70,209
0.002	0.004	217.241	17.72	959.87	80.91	1.56	2.76	162,931
0.002	0.061	205.006	7.00	45.10	46.67	0.07	2.14	7,138
0.002	0.054	186.246	9.17	104.26	89.26	0.16	4.80	16,501
0.002	0.033	185.159	11.23	173.63	100.79	0.26	4.90	27,479
0.002	0.025	185.751	14.02	253.13	144.36	0.38	5.37	40,060
0.002	0.020	184.510	19.54	394.94	187.93	0.60	6.92	62,504
0.002	0.013	185.456	28.64	708.95	276.15	1.07	8.05	112,201
0.002	0.014	185.931	33.33	989.20	704.44	1.50	11.73	156,554
0.004	0.070	244.369	2.28	11.94	14.25	0.03	0.56	1,955
0.003	0.057	170.490	2.42	13.69	17.00	0.03	0.73	2,216
0.002	0.055	170.490	4.01	13.74	25.39	0.04	1.05	3,239
0.002	0.032	170.490	4.30	37.34	41.00	0.08	1.23	6,479
0.002	0.031	170.490	4.42	61.44	47.15	0.13	2.01	10,911
0.007	0.146	420.542	4.15	20.78	25.89	0.05	1.17	3,364
0.005	0.139	420.542	11.35	37.46	69.23	0.11	2.92	8,831
0.005	0.104	420.542	16.06	110.49	103.90	0.20	3.86	15,560
0.005	0.098	420.542	19.27	211.64	161.45	0.41	8.24	35,326
0.005	0.059	420.542	26.41	332.32	197.37	0.71	8.97	63,502
0.005	0.032	420.542	29.35	164.31	230.64	1.03	6.85	91,258
0.004	0.031	420.542	48.73	275.06	363.91	1.54	11.37	156,442
0.004	0.031	420.542	81.12	454.74	614.08	2.60	19.02	258,633
0.004	0.047	420.542	232.36	1,131.22	3,406.82	6.17	68.10	613,991
0.002	0.079	218.584	9.26	42.11	52.49	0.07	2.83	7,799
0.002	0.062	197.000	9.78	92.39	97.87	0.16	5.38	17,112
0.002	0.025	196.168	8.46	152.28	80.02	0.27	3.65	28,205
0.002	0.029	196.825	15.75	226.61	173.84	0.40	6.11	41,973
0.002	0.035	198.815	27.80	359.45	287.73	0.64	11.63	66,578
0.002	0.004	196.512	19.53	552.23	139.05	0.98	1.89	102,285
0.002	0.082	233.725	13.73	60.10	73.25	0.11	3.87	11,052
0.002	0.026	210.725	6.08	110.39	76.81	0.19	2.47	20,299
0.002	0.017	210.041	6.07	148.03	63.45	0.26	2.26	27,219

0.002	0.014	210.556	10.13	238.53	123.43	0.42	2.88	43,860
0.002	0.004	207.784	10.86	422.49	83.94	0.74	1.34	77,688
0.002	0.004	210.233	29.61	714.57	337.43	1.25	2.40	131,396
0.002	0.056	227.865	9.10	44.33	59.75	0.09	2.33	9,476
0.002	0.187	209.321	24.92	79.89	191.18	0.16	15.23	17,079
0.002	0.125	207.538	36.43	145.31	334.68	0.30	18.69	31,065
0.002	0.073	207.843	34.30	205.12	341.12	0.42	15.36	43,851
0.002	0.080	209.976	65.42	347.75	616.98	0.71	28.20	74,342
0.002	0.077	207.154	102.14	565.99	1,231.57	1.16	45.26	120,999
0.002	0.110	210.153	16.57	41.19	68.20	0.08	4.58	8,763
0.002	0.086	187.007	13.44	75.74	109.46	0.15	7.43	16,110
0.002	0.043	188.651	15.29	133.03	119.17	0.27	6.38	28,297
0.002	0.025	188.316	16.36	182.29	153.43	0.37	5.14	38,775
0.002	0.025	187.772	26.29	282.20	215.86	0.57	8.03	60,029
0.002	0.027	186.204	51.50	525.63	418.69	1.07	16.18	111,811
0.002	0.026	189.310	61.08	744.73	1,068.11	1.51	21.50	158,417
0.002	0.033	187.940	136.22	1,343.84	2,285.46	2.73	50.07	285,857
0.003	0.410	279.274	55.94	45.54	111.16	0.10	14.81	10,094
0.002	0.221	258.145	26.82	98.21	245.13	0.21	18.63	21,769
0.002	0.089	255.822	30.31	191.78	278.88	0.41	14.74	42,509
0.002	0.069	250.947	36.05	254.71	356.38	0.54	15.63	56,456
0.002	0.050	252.880	48.76	435.09	490.46	0.92	19.23	96,436
0.002	0.042	251.874	63.18	642.00	650.23	1.36	23.75	142,297
0.002	0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.002	0.059	257.796	257.05	2,236.99	4,238.87	4.73	114.12	495,821
0.007	0.133	466.006	3.25	17.07	20.38	0.04	0.80	2,796
0.006	0.103	443.274	17.44	123.60	108.71	0.21	3.82	16,401
0.005	0.096	443.274	20.18	222.51	158.15	0.43	7.85	36,348
0.005	0.059	443.274	30.10	375.35	197.48	0.79	9.32	70,037
0.006	0.038	535.623	39.65	212.79	263.37	1.30	8.14	115,695
0.002	0.034	215.318	5.92	59.89	53.99	0.09	1.49	9,360
0.002	0.025	192.959	4.17	87.08	52.99	0.13	1.79	13,610
0.002	0.019	191.382	7.50	187.26	69.64	0.28	2.93	29,267
0.002	0.015	188.393	8.44	241.72	99.06	0.36	3.02	37,779
0.002	0.003	187.666	6.23	332.20	25.98	0.50	0.90	51,921
0.002	0.039	192.714	36.93	653.51	478.90	0.98	20.91	102,138
0.002	0.011	192.714	27.21	1,233.03	839.52	1.84	11.39	192,714
0.002	0.047	179.010	4.92	30.34	42.20	0.06	1.67	6,385
0.002	0.047	158.482	7.55	66.78	81.76	0.13	4.19	14,054
0.001	0.036	156.993	10.69	112.62	111.76	0.23	5.42	23,702
0.002	0.025	159.314	13.06	163.55	162.96	0.33	5.32	34,422
0.002	0.017	157.114	15.03	270.50	161.21	0.54	6.08	56,931
0.002	0.012	157.806	19.49	461.18	200.40	0.93	7.47	97,063
0.002	0.020	157.333	38.18	608.72	806.87	1.22	15.97	128,114
0.001	0.010	155.194	30.25	841.35	770.80	1.69	10.89	177,076
0.003	0.113	265.154	12.88	54.93	66.92	0.09	4.03	9,436
0.002	0.095	239.305	12.96	108.00	116.04	0.18	7.40	18,552
0.002	0.057	238.803	22.22	221.69	189.52	0.36	9.15	38,082
0.002	0.023	237.291	15.45	282.36	149.96	0.46	4.68	48,504
0.002	0.037	238.264	29.11	419.57	327.81	0.69	11.18	72,075
0.002	0.008	238.264	20.32	1,176.17	871.58	1.93	6.80	202,048
0.002	0.068	209.755	9.17	37.63	54.44	0.08	2.60	8,035

0.002	0.044	194.500	7.62	75.28	73.89	0.15	3.65	16,076
0.002	0.028	191.394	10.22	129.01	80.67	0.26	4.06	27,548
0.002	0.021	191.774	13.32	183.41	119.48	0.37	4.33	39,164
0.002	0.017	191.657	18.76	287.34	147.12	0.59	5.57	61,357
0.002	0.035	190.518	51.90	512.69	512.13	1.05	20.01	109,475
0.002	0.019	194.411	43.91	793.37	943.66	1.62	16.27	169,410
0.002	0.022	193.002	130.97	1,812.80	2,340.59	3.70	44.18	387,090
0.003	0.111	293.433	13.42	64.94	79.13	0.11	4.40	11,672
0.003	0.164	264.816	21.75	120.90	193.82	0.21	13.45	21,730
0.002	0.093	260.386	27.18	208.43	264.40	0.36	13.41	37,462
0.003	0.078	263.790	37.67	320.58	410.11	0.55	17.02	57,618
0.003	0.042	262.546	37.43	523.71	361.22	0.90	15.23	94,127
0.003	0.005	264.137	19.62	910.06	94.22	1.56	2.81	163,567
0.003	0.314	262.792	530.62	1,257.44	5,785.99	2.16	269.68	226,001
0.004	0.089	255.735	3.47	17.38	21.65	0.04	0.97	2,813
0.003	0.085	255.735	6.58	21.69	40.10	0.06	1.69	5,115
0.003	0.073	255.735	14.94	95.81	81.88	0.15	3.34	11,764
0.003	0.067	255.735	11.67	112.51	84.71	0.21	4.69	17,901
0.003	0.041	255.735	22.58	244.24	143.69	0.50	7.15	44,498
0.003	0.021	255.735	21.59	101.85	141.84	0.61	4.49	53,960
0.003	0.021	255.735	29.69	138.50	182.86	0.75	6.11	75,953
0.002	0.090	217.468	8.808	19.187	46.177	0.061	2.634	6337.108
0.002	0.072	196.847	13.667	51.888	107.641	0.164	6.305	17137.970
0.002	0.031	198.976	14.973	95.719	102.110	0.302	4.897	31615.051
0.002	0.023	198.618	17.451	126.893	117.312	0.400	4.754	41911.474
0.002	0.018	200.989	27.838	226.624	188.347	0.715	6.810	74851.649
0.002	0.032	200.446	68.891	398.063	546.458	1.256	21.140	131476.004
0.002	0.028	200.061	76.626	543.465	1214.271	1.714	25.321	179500.946
0.002	0.022	202.569	124.991	1081.987	2123.976	3.413	38.217	357369.342

2013

		2013		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
AvgHP		Equipment	MaxHP	ROG	CO	NOX	SOX
0	46	Aerial Lifts	50	0.099	0.866	1.335	0.002
50	74		120	0.078	0.778	1.211	0.002
120	130		175	0.071	0.778	1.162	0.002
175	210		250	0.353	0.778	3.634	0.002
250	380		500	0.075	0.778	1.413	0.002
0	12	Air Compressors	15	0.452	1.818	2.731	0.004
15	24		25	0.492	1.388	2.452	0.003
25	37		50	1.096	3.074	2.704	0.004
50	78		120	0.469	1.880	2.861	0.003
120	147		175	0.319	1.554	2.543	0.003
175	218		250	0.206	0.608	2.315	0.003
250	385		500	0.188	0.627	2.038	0.003
500	595		750	0.191	0.627	2.106	0.003
750	808		1000	0.230	0.779	2.818	0.003
0	39	Bore/Drill Rigs	50	0.450	1.217	2.735	0.003
50	82		120	0.184	1.019	2.274	0.002
120	149		175	0.168	1.073	2.162	0.003
175	208		250	0.126	1.053	2.019	0.003
250	349		500	0.115	1.032	1.756	0.002
500	612		750	0.085	1.073	1.295	0.003
750	919		1000	0.071	1.057	1.742	0.003
1000	2667		9999	0.086	1.056	2.122	0.003
0	9	Cement and Mortar	15	0.375	1.943	2.365	0.005
15	25		25	0.490	1.473	2.737	0.004
0	18	Concrete/Industrial	25	0.501	1.708	3.165	0.005
25	33		50	1.314	4.010	3.926	0.005
50	81		120	0.597	2.707	4.006	0.005
120	175		175	0.407	2.253	3.529	0.005
0	41	Cranes	50	0.645	0.826	1.760	0.002
50	89		120	0.382	0.749	3.015	0.001
120	148		175	0.249	0.757	2.545	0.001
175	217		250	0.206	0.754	2.350	0.001
250	336		500	0.150	0.752	1.877	0.001
500	567		750	0.083	0.751	1.258	0.001
750	938		1000	0.313	0.748	3.343	0.001
1000	1030		9999	0.102	0.752	1.880	0.001
0	43	Crawler Tractors	50	1.154	1.328	2.757	0.002
50	87		120	0.403	1.228	3.279	0.002
120	150		175	0.286	1.215	3.012	0.002
175	203		250	0.207	1.219	2.730	0.002
250	341		500	0.189	1.225	2.499	0.002
500	570		750	0.158	1.218	2.186	0.002
750	828		1000	0.212	1.223	3.167	0.002

1000	1527		9999	0.149	1.168	2.571	0.002
0	45	Crushing/Proc	50	1.757	5.048	4.391	0.006
50	85		120	0.749	3.074	4.563	0.005
120	171		175	0.516	2.549	4.043	0.005
175	250		250	0.335	0.983	3.667	0.005
250	382		500	0.310	1.006	3.217	0.004
500	602		750	0.312	0.994	3.342	0.004
750	1337		9999	0.382	1.248	4.512	0.004
0	16	Dumpers/Tend	25	0.273	0.906	1.702	0.003
0	36	Excavators	50	0.334	1.083	1.930	0.002
50	82		120	0.215	0.962	2.051	0.002
120	146		175	0.169	0.973	1.944	0.002
175	218		250	0.129	0.974	1.886	0.002
250	329		500	0.099	0.970	1.426	0.002
500	578		750	0.101	0.963	1.500	0.002
750	843		1000	0.132	0.969	2.234	0.002
1000	1569		9999	0.089	0.963	1.535	0.002
0	42	Forklifts	50	0.469	0.638	1.236	0.001
50	82		120	0.176	0.572	1.450	0.001
120	141		175	0.131	0.573	1.387	0.001
175	208		250	0.139	0.574	1.562	0.001
250	344		500	0.121	0.575	1.389	0.001
500	880		1000	0.327	0.573	3.140	0.001
0	11	Generator Sets	15	0.606	2.803	4.138	0.007
15	19		25	0.628	2.140	3.780	0.005
25	33		50	1.163	3.578	3.888	0.005
50	84		120	0.583	2.637	4.042	0.005
120	153		175	0.390	2.184	3.592	0.005
175	229		250	0.247	0.855	3.266	0.005
250	363		500	0.222	0.891	2.938	0.004
500	586		750	0.230	0.891	3.031	0.004
750	1130		9999	0.312	1.101	4.058	0.004
0	39	Graders	50	1.338	1.157	2.686	0.002
50	91		120	0.557	1.108	4.186	0.002
120	148		175	0.367	1.134	3.610	0.002
175	204		250	0.164	1.121	2.348	0.002
250	293		500	0.129	1.111	1.517	0.002
500	796		1000	0.303	1.109	3.798	0.002
1000	1993		9999	0.184	1.107	2.669	0.002
0	38	Off-Highway T	50	0.774	1.299	2.509	0.002
50	75		120	0.350	1.183	2.960	0.002
120	158		175	0.208	1.175	2.361	0.002
175	214		250	0.195	1.168	2.663	0.002
250	334		500	0.139	1.171	1.919	0.002
500	574		750	0.131	1.172	1.884	0.002
750	1000		1000	0.473	1.172	5.345	0.002
1000	1726		9999	0.233	1.178	3.207	0.002
0	29	Off-Highway T	50	0.655	0.651	2.205	0.002
50	87		120	0.352	0.596	2.758	0.002
120	159		175	0.226	0.602	2.209	0.002
175	211		250	0.209	0.601	2.314	0.002
250	372		500	0.169	0.610	1.933	0.002

500	656		750	0.217	0.611	2.409	0.002
750	897		1000	0.182	0.606	2.632	0.002
1000	1764		9999	0.186	0.613	2.470	0.002
0	38	Other Constru	50	0.574	1.338	2.328	0.002
50	82		120	0.326	1.190	2.837	0.002
120	152		175	0.259	1.189	2.779	0.002
175	217		250	0.192	1.204	2.595	0.002
250	357		500	0.161	1.208	2.136	0.002
500	598		750	0.117	1.196	1.765	0.002
750	830		1000	0.115	1.192	2.061	0.002
1000	1127		9999	0.190	1.164	2.749	0.002
0	35	Other General	50	0.556	0.972	1.929	0.002
50	73		120	0.295	0.869	2.403	0.002
120	149		175	0.192	0.872	2.058	0.002
175	209		250	0.183	0.875	2.228	0.002
250	355		500	0.131	0.874	1.647	0.002
500	592		750	0.104	0.875	1.408	0.002
750	885		1000	0.121	0.872	2.156	0.002
1000	2000		9999	0.071	0.872	1.476	0.002
0	36	Other Material	50	0.732	1.196	2.315	0.002
50	93		120	0.252	1.081	2.278	0.002
120	145		175	0.232	1.078	2.433	0.002
175	218		250	0.221	1.076	2.697	0.002
250	331		500	0.152	1.074	1.926	0.002
500	565		750	0.090	1.078	1.352	0.002
750	923		1000	0.090	1.078	1.808	0.002
1000	1050		9999	0.085	1.078	1.754	0.002
0	39	Pavers	50	0.831	1.430	2.427	0.002
50	80		120	0.309	1.273	2.674	0.002
120	158		175	0.230	1.281	2.517	0.002
175	213		250	0.090	1.285	1.757	0.002
250	327		500	0.089	1.267	1.410	0.002
500	750		750	0.069	1.280	1.006	0.002
0	35	Paving Equipm	50	0.415	1.294	1.882	0.002
50	89		120	0.264	1.177	2.364	0.002
120	148		175	0.166	1.170	1.990	0.002
175	216		250	0.127	1.174	1.865	0.002
250	339		500	0.119	1.166	1.697	0.002
500	605		750	0.078	1.174	1.392	0.002
750	842		1000	0.182	1.175	2.657	0.002
0	8	Plate Compact	15	0.284	1.492	1.781	0.004
0	13	Pressure Wash	15	0.246	1.136	1.678	0.003
15	19		25	0.254	0.867	1.532	0.002
25	38		50	0.366	1.224	1.523	0.002
50	64		120	0.209	1.019	1.564	0.002
0	8	Pumps	15	0.697	2.803	4.210	0.007
15	21		25	0.759	2.140	3.780	0.005
25	37		50	1.251	3.766	3.932	0.005
50	84		120	0.606	2.679	4.104	0.005
120	151		175	0.406	2.218	3.648	0.005
175	217		250	0.259	0.870	3.318	0.005
250	372		500	0.233	0.913	2.973	0.004

500	615		750	0.240	0.913	3.068	0.004
750	1460		9999	0.320	1.126	4.105	0.004
0	36	Rollers	50	0.527	1.181	2.064	0.002
50	87		120	0.288	1.065	2.532	0.002
120	144		175	0.155	1.059	1.919	0.002
175	213		250	0.163	1.062	2.230	0.002
250	335		500	0.155	1.071	2.040	0.002
500	521		750	0.240	1.061	3.215	0.002
0	47	Rough Terrain	50	0.505	1.273	2.147	0.002
50	96		120	0.166	1.145	1.979	0.002
120	130		175	0.100	1.142	1.571	0.002
175	208		250	0.148	1.149	1.929	0.002
250	374		500	0.118	1.132	1.857	0.002
500	625		750	0.031	1.143	0.524	0.002
0	42	Rubber Tired D	50	1.214	1.060	2.619	0.002
50	82		120	0.506	0.975	3.772	0.002
120	150		175	0.396	0.970	3.883	0.002
175	211		250	0.299	0.973	3.205	0.002
250	354		500	0.300	0.983	3.295	0.002
500	584		750	0.223	0.969	2.961	0.002
0	42	Rubber Tired L	50	0.829	0.988	2.238	0.002
50	86		120	0.346	0.880	2.705	0.002
120	150		175	0.239	0.888	2.390	0.002
175	206		250	0.158	0.886	2.081	0.002
250	320		500	0.165	0.884	1.980	0.002
500	600		750	0.156	0.861	1.806	0.002
750	837		1000	0.154	0.887	2.412	0.002
1000	1521		9999	0.153	0.884	2.287	0.002
0	36	Scrapers	50	1.586	1.260	3.228	0.003
50	84		120	0.361	1.167	3.419	0.002
120	166		175	0.380	1.155	4.019	0.002
175	225		250	0.392	1.131	4.440	0.002
250	381		500	0.251	1.140	3.144	0.002
500	565		750	0.196	1.140	2.576	0.002
750	950		1000	0.593	1.138	6.460	0.002
1000	1923		9999	0.251	1.163	3.495	0.002
0	6	Signal Boards	15	0.542	2.845	3.397	0.007
15	37		50	1.412	4.236	4.184	0.006
50	82		120	0.651	2.882	4.318	0.005
120	158		175	0.441	2.392	3.829	0.005
175	216		250	0.343	1.122	4.193	0.006
0	43	Skid Steer Loa	50	0.294	1.377	1.785	0.002
50	71		120	0.131	1.234	1.637	0.002
120	153		175	0.122	1.225	1.598	0.002
175	201		250	0.121	1.213	1.625	0.002
250	277		500	0.085	1.201	1.130	0.002
500	530		750	0.052	1.233	0.881	0.002
750	1000		1000	0.081	1.233	1.385	0.002
0	36	Surfacing Equi	50	0.386	0.845	1.670	0.002
50	89		120	0.185	0.748	1.754	0.002
120	151		175	0.156	0.748	1.791	0.002
175	216		250	0.117	0.757	1.773	0.002

250	362		500	0.077	0.745	1.234	0.001
500	615		750	0.057	0.748	1.044	0.002
750	814		1000	0.093	0.752	1.724	0.002
1000	1141		9999	0.050	0.737	1.151	0.001
0	36	Sweepers/Scrubbers	50	0.851	1.544	2.637	0.003
50	78		120	0.409	1.393	3.257	0.002
120	159		175	0.450	1.390	4.448	0.002
175	204		250	0.237	1.381	3.036	0.002
250	303		500	0.214	1.387	2.732	0.002
500	848		1000	0.069	1.387	1.822	0.002
0	38	Tractors/Loaders	50	0.554	0.984	2.029	0.002
50	83		120	0.239	0.915	2.167	0.002
120	144		175	0.175	0.898	1.963	0.002
175	204		250	0.131	0.900	1.924	0.002
250	320		500	0.125	0.905	1.759	0.002
500	575		750	0.116	0.890	1.590	0.002
750	871		1000	0.079	0.912	1.611	0.002
1000	2006		9999	0.135	0.904	2.112	0.002
0	40	Trenchers	50	0.680	1.635	2.769	0.003
50	82		120	0.447	1.474	3.744	0.003
120	144		175	0.405	1.449	4.268	0.002
175	218		250	0.277	1.465	3.537	0.003
250	359		500	0.166	1.462	2.313	0.003
500	619		750	0.064	1.471	1.033	0.003
750	860		1000	0.592	1.462	6.572	0.003
0	11	Welders	15	0.424	1.704	2.560	0.004
15	20		25	0.462	1.301	2.299	0.003
25	46		50	0.937	2.673	2.482	0.003
50	70		120	0.414	1.714	2.618	0.003
120	174		175	0.280	1.417	2.328	0.003
175	211		250	0.180	0.556	2.118	0.003
250	297		500	0.163	0.578	1.876	0.003
0	29	Water Trucks	50	0.655	0.651	2.205	0.002
50	87		120	0.352	0.596	2.758	0.002
120	159		175	0.226	0.602	2.209	0.002
175	211		250	0.209	0.601	2.314	0.002
250	372		500	0.169	0.610	1.933	0.002
500	656		750	0.217	0.611	2.409	0.002
750	897		1000	0.182	0.606	2.632	0.002
1000	1764		9999	0.186	0.613	2.470	0.002

2024

AvgHP		2024		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
		Equipment	MaxHP	ROG	CO	NOX	SOX
0	46	Aerial Lifts	50	0.051	0.866	0.890	0.002
50	74		120	0.032	0.778	0.471	0.002



120	130		175	0.028	0.778	0.176	0.002
175	210		250	0.020	0.778	0.081	0.002
250	380		500	0.026	0.778	0.199	0.002
0	12	Air Compresso	15	0.332	1.680	2.078	0.004
15	24		25	0.346	1.149	2.128	0.003
25	37		50	0.348	2.358	1.886	0.004
50	78		120	0.182	1.758	1.225	0.003
120	147		175	0.143	1.539	0.803	0.003
175	218		250	0.115	0.527	0.641	0.003
250	385		500	0.113	0.506	0.589	0.003
500	595		750	0.113	0.506	0.601	0.003
750	808		1000	0.121	0.525	1.510	0.003
0	39	Bore/Drill Rigs	50	0.320	1.185	2.090	0.003
50	82		120	0.093	1.031	1.114	0.002
120	149		175	0.065	1.071	0.517	0.003
175	208		250	0.057	1.053	0.490	0.003
250	349		500	0.054	1.039	0.432	0.002
500	612		750	0.047	1.074	0.337	0.003
750	919		1000	0.030	1.055	1.142	0.003
1000	2667		9999	0.107	1.056	2.176	0.003
0	9	Cement and M	15	0.370	1.943	2.320	0.005
15	25		25	0.388	1.316	2.447	0.004
0	18	Concrete/Indu	25	0.500	1.708	3.163	0.005
25	33		50	0.411	3.162	2.702	0.005
50	81		120	0.220	2.556	1.690	0.005
120	175		175	0.172	2.243	1.036	0.005
0	41	Cranes	50	0.584	0.825	1.668	0.002
50	89		120	0.158	0.749	1.331	0.001
120	148		175	0.115	0.756	1.067	0.001
175	217		250	0.085	0.754	0.854	0.001
250	336		500	0.070	0.752	0.687	0.001
500	567		750	0.058	0.750	0.547	0.001
750	938		1000	0.180	0.747	2.057	0.001
1000	1030		9999	0.066	0.752	0.694	0.001
0	43	Crawler Tracto	50	0.788	1.327	2.133	0.002
50	87		120	0.230	1.226	1.891	0.002
120	150		175	0.146	1.215	1.304	0.002
175	203		250	0.118	1.215	1.266	0.002
250	341		500	0.102	1.220	0.962	0.002
500	570		750	0.081	1.216	0.758	0.002
750	828		1000	0.118	1.222	2.011	0.002
1000	1527		9999	0.142	1.168	2.433	0.002
0	45	Crushing/Proc	50	0.542	3.907	3.003	0.006
50	85		120	0.285	2.884	1.864	0.005
120	171		175	0.224	2.530	1.149	0.005
175	250		250	0.184	0.865	0.909	0.005
250	382		500	0.182	0.829	0.840	0.004
500	602		750	0.182	0.829	0.857	0.004
750	1337		9999	0.214	0.855	2.363	0.004
0	16	Dumpers/Tend	25	0.261	0.889	1.646	0.003
0	36	Excavators	50	0.166	1.083	1.340	0.002
50	82		120	0.087	0.963	0.858	0.002

120	146		175	0.068	0.973	0.506	0.002
175	218		250	0.056	0.973	0.423	0.002
250	329		500	0.048	0.968	0.317	0.002
500	578		750	0.057	0.965	0.422	0.002
750	843		1000	0.039	0.965	0.900	0.002
1000	1569		9999	0.028	0.963	0.875	0.002
0	42	Forklifts	50	0.146	0.638	0.812	0.001
50	82		120	0.063	0.572	0.566	0.001
120	141		175	0.047	0.573	0.374	0.001
175	208		250	0.041	0.574	0.327	0.001
250	344		500	0.046	0.575	0.346	0.001
500	880		1000	0.022	0.573	0.485	0.001
0	11	Generator Set	15	0.455	2.591	3.195	0.007
15	19		25	0.517	1.771	3.281	0.005
25	33		50	0.366	2.823	2.695	0.005
50	84		120	0.201	2.479	1.780	0.005
120	153		175	0.153	2.170	1.159	0.005
175	229		250	0.119	0.744	0.926	0.005
250	363		500	0.116	0.729	0.856	0.004
500	586		750	0.116	0.729	0.873	0.004
750	1130		9999	0.141	0.756	2.212	0.004
0	39	Graders	50	0.791	1.160	2.055	0.002
50	91		120	0.292	1.104	2.221	0.002
120	148		175	0.156	1.124	1.309	0.002
175	204		250	0.112	1.113	1.256	0.002
250	293		500	0.125	1.105	0.994	0.002
500	796		1000	0.049	1.109	0.994	0.002
1000	1993		9999	0.182	1.107	2.514	0.002
0	38	Off-Highway T	50	0.272	1.301	1.681	0.002
50	75		120	0.138	1.182	1.284	0.002
120	158		175	0.083	1.174	0.651	0.002
175	214		250	0.077	1.168	0.600	0.002
250	334		500	0.060	1.166	0.372	0.002
500	574		750	0.077	1.171	0.538	0.002
750	1000		1000	0.086	1.172	1.074	0.002
1000	1726		9999	0.133	1.206	1.691	0.002
0	29	Off-Highway T	50	0.262	0.660	1.520	0.002
50	87		120	0.160	0.596	1.240	0.002
120	159		175	0.089	0.602	0.571	0.002
175	211		250	0.081	0.601	0.518	0.002
250	372		500	0.074	0.609	0.472	0.002
500	656		750	0.103	0.607	0.796	0.002
750	897		1000	0.083	0.606	1.313	0.002
1000	1764		9999	0.072	0.614	1.192	0.002
0	38	Other Constr	50	0.360	1.339	1.874	0.002
50	82		120	0.166	1.194	1.488	0.002
120	152		175	0.113	1.188	1.047	0.002
175	217		250	0.086	1.204	0.873	0.002
250	357		500	0.076	1.205	0.697	0.002
500	598		750	0.067	1.199	0.650	0.002
750	830		1000	0.050	1.201	1.098	0.002
1000	1127		9999	0.074	1.163	1.356	0.002

0	35	Other General	50	0.195	0.972	1.319	0.002
50	73		120	0.103	0.869	0.925	0.002
120	149		175	0.068	0.872	0.495	0.002
175	209		250	0.062	0.875	0.451	0.002
250	355		500	0.056	0.874	0.394	0.002
500	592		750	0.041	0.875	0.215	0.002
750	885		1000	0.071	0.872	1.357	0.002
1000	2000		9999	0.032	0.872	0.809	0.002
0	36	Other Material	50	0.390	1.196	1.810	0.002
50	93		120	0.091	1.081	0.878	0.002
120	145		175	0.086	1.078	0.648	0.002
175	218		250	0.087	1.076	0.785	0.002
250	331		500	0.088	1.074	0.694	0.002
500	565		750	0.060	1.078	0.367	0.002
750	923		1000	0.021	1.078	0.892	0.002
1000	1050		9999	0.024	1.078	0.900	0.002
0	39	Pavers	50	0.413	1.428	1.746	0.002
50	80		120	0.147	1.275	1.361	0.002
120	158		175	0.083	1.281	0.751	0.002
175	213		250	0.052	1.283	0.558	0.002
250	327		500	0.062	1.267	0.643	0.002
500	750		750	0.025	1.280	0.109	0.002
0	35	Paving Equipn	50	0.194	1.295	1.329	0.002
50	89		120	0.097	1.176	0.949	0.002
120	148		175	0.073	1.170	0.634	0.002
175	216		250	0.051	1.174	0.460	0.002
250	339		500	0.058	1.165	0.534	0.002
500	605		750	0.049	1.172	0.458	0.002
750	842		1000	0.042	1.175	0.841	0.002
0	8	Plate Compac	15	0.284	1.492	1.781	0.004
0	13	Pressure Was	15	0.184	1.050	1.295	0.003
15	19		25	0.210	0.718	1.330	0.002
25	38		50	0.104	0.975	1.049	0.002
50	64		120	0.064	0.959	0.692	0.002
0	8	Pumps	15	0.512	2.591	3.204	0.007
15	21		25	0.533	1.771	3.281	0.005
25	37		50	0.403	2.964	2.731	0.005
50	84		120	0.215	2.517	1.804	0.005
120	151		175	0.165	2.203	1.178	0.005
175	217		250	0.129	0.755	0.942	0.005
250	372		500	0.125	0.737	0.868	0.004
500	615		750	0.126	0.737	0.886	0.004
750	1460		9999	0.151	0.766	2.235	0.004
0	36	Rollers	50	0.244	1.180	1.435	0.002
50	87		120	0.107	1.064	1.067	0.002
120	144		175	0.056	1.059	0.497	0.002
175	213		250	0.070	1.063	0.742	0.002
250	335		500	0.082	1.072	0.831	0.002
500	521		750	0.039	1.061	0.268	0.002
0	47	Rough Terrain	50	0.240	1.271	1.469	0.002
50	96		120	0.061	1.146	0.769	0.002
120	130		175	0.043	1.142	0.420	0.002

175	208		250	0.050	1.145	0.595	0.002
250	374		500	0.028	1.130	0.191	0.002
500	625		750	0.049	1.143	0.541	0.002
0	42	Rubber Tired L	50	0.205	1.066	1.425	0.002
50	82		120	0.291	0.979	2.215	0.002
120	150		175	0.220	0.970	1.982	0.002
175	211		250	0.165	0.972	1.617	0.002
250	354		500	0.172	0.982	1.593	0.002
500	584		750	0.176	0.969	2.108	0.002
0	42	Rubber Tired L	50	0.382	0.988	1.616	0.002
50	86		120	0.150	0.880	1.208	0.002
120	150		175	0.093	0.886	0.682	0.002
175	206		250	0.075	0.885	0.653	0.002
250	320		500	0.079	0.883	0.616	0.002
500	600		750	0.085	0.876	0.681	0.002
750	837		1000	0.076	0.890	1.282	0.002
1000	1521		9999	0.092	0.884	1.512	0.002
0	36	Scrapers	50	1.562	1.260	3.085	0.003
50	84		120	0.290	1.164	2.717	0.002
120	166		175	0.170	1.154	1.523	0.002
175	225		250	0.152	1.132	1.454	0.002
250	381		500	0.124	1.140	1.195	0.002
500	565		750	0.107	1.137	1.055	0.002
750	950		1000	0.593	1.138	6.460	0.002
1000	1923		9999	0.107	1.163	1.935	0.002
0	6	Signal Boards	15	0.542	2.845	3.397	0.007
15	37		50	0.437	3.313	2.856	0.006
50	82		120	0.231	2.710	1.806	0.005
120	158		175	0.179	2.377	1.113	0.005
175	216		250	0.175	0.983	1.069	0.006
0	43	Skid Steer Loa	50	0.135	1.379	1.233	0.002
50	71		120	0.057	1.235	0.718	0.002
120	153		175	0.050	1.225	0.457	0.002
175	201		250	0.043	1.206	0.499	0.002
250	277		500	0.024	1.201	0.094	0.002
500	530		750	0.071	1.233	0.905	0.002
750	1000		1000	0.028	1.233	0.843	0.002
0	36	Surfacing Equ	50	0.105	0.851	1.122	0.002
50	89		120	0.079	0.754	0.869	0.002
120	151		175	0.072	0.746	0.743	0.001
175	216		250	0.055	0.757	0.674	0.002
250	362		500	0.042	0.746	0.446	0.001
500	615		750	0.030	0.751	0.285	0.002
750	814		1000	0.041	0.752	0.902	0.002
1000	1141		9999	0.028	0.737	0.678	0.001
0	36	Sweepers/Scrn	50	0.356	1.544	1.858	0.003
50	78		120	0.158	1.393	1.412	0.002
120	159		175	0.127	1.390	1.027	0.002
175	204		250	0.078	1.381	0.735	0.002
250	303		500	0.100	1.387	1.086	0.002
500	848		1000	0.027	1.387	1.036	0.002
0	38	Tractors/Load	50	0.227	0.982	1.389	0.002

50	83		120	0.088	0.911	0.843	0.002
120	144		175	0.068	0.897	0.507	0.002
175	204		250	0.065	0.898	0.549	0.002
250	320		500	0.058	0.899	0.429	0.002
500	575		750	0.085	0.892	0.816	0.002
750	871		1000	0.053	0.910	1.089	0.002
1000	2006		9999	0.067	0.904	1.165	0.002
0	40	Trenchers	50	0.316	1.632	1.927	0.003
50	82		120	0.260	1.473	2.308	0.003
120	144		175	0.191	1.449	1.843	0.002
175	218		250	0.164	1.468	1.750	0.003
250	359		500	0.101	1.456	0.934	0.002
500	619		750	0.034	1.470	0.153	0.003
750	860		1000	0.617	1.462	6.729	0.003
0	11	Welders	15	0.312	1.575	1.948	0.004
15	20		25	0.324	1.077	1.995	0.003
25	46		50	0.302	2.068	1.731	0.003
50	70		120	0.157	1.606	1.134	0.003
120	174		175	0.123	1.406	0.743	0.003
175	211		250	0.098	0.482	0.595	0.003
250	297		500	0.096	0.465	0.546	0.003
0	29	Water Trucks	50	0.262	0.660	1.520	0.002
50	87		120	0.160	0.596	1.240	0.002
120	159		175	0.089	0.602	0.571	0.002
175	211		250	0.081	0.601	0.518	0.002
250	372		500	0.074	0.609	0.472	0.002
500	656		750	0.103	0.607	0.796	0.002
750	897		1000	0.083	0.606	1.313	0.002
1000	1764		9999	0.072	0.614	1.192	0.002

g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.060	179.282	4.56	39.91	61.56	0.08	2.78	8,267
0.062	161.199	5.79	57.61	89.63	0.11	4.60	11,932
0.048	161.168	9.28	101.52	151.64	0.20	6.31	21,028
0.189	161.179	74.05	163.42	763.11	0.32	39.63	33,848
0.031	161.179	28.56	295.70	536.84	0.58	11.72	61,248
0.178	272.784	5.42	21.81	32.77	0.05	2.14	3,273
0.150	272.784	11.81	33.31	58.84	0.08	3.60	6,547
0.265	272.784	40.56	113.75	100.06	0.13	9.79	10,093
0.260	272.784	36.55	146.68	223.13	0.25	20.24	21,277
0.143	272.784	46.96	228.39	373.89	0.45	20.97	40,099
0.071	272.784	44.81	132.50	504.66	0.67	15.40	59,467
0.066	272.784	72.39	241.32	784.59	1.03	25.33	105,022
0.067	272.784	113.42	372.95	1,253.10	1.63	39.92	162,306
0.081	272.784	186.09	629.23	2,277.21	2.22	65.62	220,409
0.200	302.960	17.69	47.80	107.43	0.11	7.86	11,898
0.140	253.743	15.19	83.93	187.22	0.20	11.53	20,891
0.100	266.966	24.98	159.31	321.15	0.38	14.84	39,654
0.062	262.064	26.27	218.73	419.49	0.52	12.90	54,445
0.058	256.977	40.21	360.49	613.23	0.86	20.17	89,732
0.044	267.078	52.08	656.62	792.26	1.56	26.99	163,441
0.041	263.092	65.12	971.35	1,600.86	2.31	37.85	241,781
0.051	262.792	228.70	2,815.34	5,659.77	6.69	135.59	700,778
0.107	318.248	3.37	17.49	21.28	0.04	0.97	2,864
0.151	318.248	12.25	36.81	68.44	0.10	3.77	7,956
0.123	414.859	9.01	30.75	56.97	0.09	2.21	7,467
0.339	414.859	43.35	132.32	129.56	0.18	11.19	13,690
0.330	414.859	48.35	219.23	324.46	0.39	26.75	33,604
0.183	414.859	71.24	394.36	617.63	0.82	32.05	72,600
0.176	165.364	26.21	33.55	71.50	0.06	7.14	6,718
0.223	149.922	33.94	66.59	268.18	0.13	19.86	13,335
0.137	151.559	36.82	111.92	376.30	0.21	20.30	22,413
0.108	150.982	44.70	163.61	509.87	0.31	23.42	32,763
0.078	150.620	50.49	252.80	630.92	0.48	26.15	50,624
0.043	150.405	47.08	426.00	713.66	0.81	24.55	85,308
0.166	149.776	293.91	701.26	3,134.30	1.34	155.27	140,430
0.046	150.667	105.04	774.95	1,936.40	1.48	47.12	155,187
0.323	245.019	49.07	56.44	117.19	0.10	13.72	10,416
0.273	226.552	34.96	106.62	284.81	0.19	23.69	19,678
0.163	224.167	42.79	181.64	450.38	0.32	24.35	33,523
0.106	224.881	41.92	247.17	553.86	0.44	21.47	45,616
0.096	226.106	64.39	417.40	851.32	0.74	32.82	77,032
0.078	224.814	89.88	694.49	1,246.47	1.22	44.72	128,170
0.093	225.670	175.16	1,012.68	2,622.97	1.78	76.82	186,893

0.067	215.490	227.42	1,782.39	3,925.17	3.14	102.34	328,945
0.426	443.274	79.06	227.18	197.60	0.26	19.17	19,947
0.416	443.274	63.68	261.31	387.88	0.44	35.39	37,678
0.229	443.274	88.16	435.83	691.38	0.85	39.24	75,800
0.113	443.274	83.81	245.80	916.66	1.25	28.13	110,818
0.105	443.274	118.27	384.15	1,228.72	1.66	40.05	169,331
0.107	443.274	187.70	598.21	2,011.88	2.68	64.18	266,851
0.131	443.274	510.69	1,668.18	6,033.16	5.96	175.77	592,657
0.082	215.954	4.37	14.50	27.23	0.04	1.31	3,455
0.150	222.405	11.95	38.70	68.96	0.08	5.36	7,948
0.154	197.595	17.55	78.67	167.72	0.15	12.63	16,159
0.097	199.812	24.72	142.07	283.88	0.28	14.13	29,181
0.060	199.958	28.16	212.68	411.96	0.42	13.11	43,685
0.046	199.153	32.62	318.65	468.79	0.63	15.16	65,450
0.048	197.771	58.59	556.47	867.17	1.09	27.86	114,299
0.061	199.011	110.97	816.65	1,883.13	1.60	51.46	167,741
0.042	197.811	139.87	1,511.16	2,408.70	2.96	66.55	310,393
0.138	117.014	19.91	27.04	52.40	0.05	5.87	4,963
0.121	105.000	14.51	47.13	119.46	0.08	9.99	8,649
0.075	105.128	18.58	80.94	196.01	0.14	10.64	14,853
0.072	105.400	28.94	119.55	325.23	0.21	15.08	21,939
0.063	105.464	41.72	197.53	477.44	0.35	21.68	36,250
0.175	105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
0.235	420.542	6.67	30.83	45.52	0.07	2.58	4,626
0.214	420.542	11.92	40.65	71.82	0.10	4.06	7,990
0.315	420.542	38.39	118.08	128.32	0.18	10.41	13,878
0.312	420.542	49.00	221.52	339.52	0.41	26.24	35,326
0.172	420.542	59.63	334.18	549.63	0.72	26.30	64,343
0.090	420.542	56.64	195.86	748.03	1.08	20.62	96,304
0.085	420.542	80.49	323.48	1,066.32	1.50	30.68	152,657
0.086	420.542	134.56	522.20	1,776.37	2.48	50.46	246,438
0.112	420.542	352.82	1,243.86	4,585.71	4.78	126.36	475,212
0.357	223.027	52.40	45.32	105.18	0.08	14.00	8,734
0.347	213.447	50.65	100.79	380.92	0.19	31.59	19,423
0.202	218.559	54.24	167.79	534.14	0.31	29.94	32,335
0.076	216.117	33.48	229.17	479.88	0.42	15.44	44,164
0.058	214.063	37.90	325.65	444.80	0.60	16.94	62,757
0.132	213.737	241.58	882.83	3,023.02	1.62	105.21	170,135
0.080	213.348	365.90	2,206.16	5,317.88	4.06	159.61	425,161
0.253	252.503	29.13	48.92	94.47	0.09	9.52	9,509
0.246	229.900	26.12	88.14	220.58	0.16	18.31	17,134
0.122	228.347	32.96	185.69	373.20	0.34	19.34	36,096
0.095	227.008	41.67	249.72	569.42	0.46	20.37	48,544
0.068	227.618	46.38	391.59	641.78	0.73	22.82	76,123
0.065	227.913	75.23	672.43	1,080.39	1.25	37.25	130,716
0.272	227.753	473.17	1,171.61	5,344.58	2.17	271.92	227,753
0.104	229.023	401.85	2,033.77	5,536.91	3.78	180.32	395,351
0.229	215.017	19.09	18.97	64.25	0.06	6.68	6,266
0.222	196.910	30.63	51.90	240.15	0.16	19.34	17,143
0.126	198.857	35.85	95.66	350.91	0.30	20.03	31,596
0.100	198.401	44.19	126.75	488.21	0.40	21.18	41,866
0.075	201.370	62.85	227.05	720.00	0.72	27.95	74,994

0.102	201.971	142.20	401.09	1,580.28	1.27	67.23	132,476
0.078	200.232	163.65	543.93	2,361.82	1.72	70.33	179,654
0.079	202.618	327.27	1,082.25	4,358.26	3.41	140.23	357,457
0.211	243.426	21.82	50.86	88.47	0.09	8.04	9,252
0.221	216.544	26.60	97.10	231.36	0.17	18.01	17,662
0.146	216.290	39.44	181.32	423.84	0.31	22.23	32,982
0.098	219.031	41.74	261.18	562.86	0.45	21.32	47,509
0.081	219.688	57.37	431.00	762.43	0.75	28.79	78,398
0.059	217.572	70.10	714.88	1,054.62	1.24	34.97	130,037
0.056	216.907	95.35	989.92	1,710.82	1.72	46.74	180,066
0.091	211.725	214.10	1,311.40	3,097.28	2.28	102.51	238,544
0.190	199.186	19.50	34.13	67.71	0.07	6.67	6,992
0.204	177.921	21.60	63.57	175.89	0.12	14.93	13,022
0.111	178.621	28.70	130.06	306.98	0.25	16.53	26,642
0.093	179.141	38.29	182.83	465.73	0.36	19.50	37,451
0.062	179.029	46.34	310.02	584.29	0.61	22.14	63,504
0.048	179.232	61.27	517.60	832.89	1.01	28.14	106,023
0.055	178.698	106.73	772.06	1,908.08	1.51	49.03	158,148
0.037	178.698	142.38	1,744.77	2,952.39	3.41	74.69	357,397
0.236	229.351	26.17	42.74	82.74	0.08	8.42	8,198
0.177	207.401	23.45	100.73	212.23	0.18	16.46	19,322
0.132	206.802	33.47	155.86	351.66	0.29	19.02	29,897
0.111	206.479	48.15	234.96	588.65	0.43	24.26	45,071
0.077	205.960	50.46	355.79	638.05	0.65	25.51	68,248
0.045	206.729	50.58	608.45	763.28	1.11	25.42	116,716
0.044	206.729	83.21	994.72	1,668.41	1.82	40.84	190,811
0.043	206.729	89.03	1,131.59	1,841.61	2.07	45.58	217,066
0.251	242.740	32.11	55.24	93.73	0.09	9.71	9,376
0.208	216.129	24.59	101.33	212.77	0.16	16.56	17,200
0.126	217.418	36.40	202.55	398.02	0.33	19.96	34,381
0.044	218.191	19.14	274.07	374.68	0.44	9.40	46,521
0.049	215.137	29.05	414.93	461.63	0.67	15.98	70,432
0.043	217.241	51.69	959.87	754.40	1.56	31.95	162,931
0.163	204.734	14.43	45.04	65.51	0.07	5.67	7,128
0.180	186.211	23.39	104.25	209.46	0.16	15.96	16,498
0.096	185.134	24.66	173.60	295.30	0.26	14.27	27,475
0.064	185.800	27.44	253.19	402.22	0.38	13.81	40,071
0.060	184.495	40.28	394.91	574.82	0.60	20.43	62,499
0.032	185.768	47.41	710.14	842.05	1.07	19.16	112,389
0.077	185.931	153.55	989.20	2,237.39	1.50	64.70	156,554
0.070	244.369	2.28	11.94	14.25	0.03	0.56	1,955
0.095	170.490	3.20	14.77	21.81	0.03	1.24	2,216
0.087	170.490	4.83	16.48	29.12	0.04	1.64	3,239
0.110	170.490	13.89	46.51	57.89	0.08	4.17	6,479
0.110	170.490	13.40	65.22	100.08	0.13	7.01	10,911
0.275	420.542	5.57	22.42	33.68	0.05	2.20	3,364
0.231	420.542	15.94	44.93	79.38	0.11	4.86	8,831
0.331	420.542	46.30	139.35	145.50	0.20	12.23	15,560
0.327	420.542	50.89	225.00	344.72	0.41	27.43	35,326
0.180	420.542	61.32	334.86	550.83	0.71	27.14	63,502
0.094	420.542	56.17	188.85	720.02	1.03	20.32	91,258
0.088	420.542	86.50	339.56	1,105.88	1.54	32.59	156,442



0.089	420.542	147.53	561.37	1,886.92	2.60	54.89	258,633
0.114	420.542	467.29	1,644.48	5,993.54	6.17	166.37	613,991
0.188	218.742	18.81	42.14	73.65	0.07	6.69	7,804
0.189	197.184	25.04	92.47	219.97	0.16	16.42	17,128
0.089	196.146	22.22	152.26	275.84	0.27	12.82	28,202
0.080	196.652	34.85	226.41	475.46	0.40	17.02	41,936
0.080	198.298	51.96	358.52	683.19	0.63	26.79	66,405
0.119	196.512	124.87	552.23	1,673.54	0.98	61.99	102,285
0.182	234.119	23.86	60.20	101.51	0.11	8.62	11,070
0.120	210.495	16.00	110.27	190.65	0.19	11.57	20,276
0.062	210.008	13.01	148.00	203.53	0.26	7.97	27,215
0.074	211.197	30.82	239.25	401.92	0.42	15.37	43,994
0.057	208.218	44.26	423.37	694.43	0.74	21.13	77,850
0.004	210.233	19.55	714.57	327.42	1.25	2.21	131,396
0.343	226.517	50.50	44.06	108.91	0.09	14.27	9,420
0.336	208.475	41.28	79.56	307.76	0.16	27.42	17,009
0.222	207.416	59.25	145.23	581.24	0.30	33.20	31,047
0.156	208.077	63.08	205.35	676.12	0.42	32.94	43,900
0.154	210.173	106.35	348.08	1,166.76	0.71	54.56	74,412
0.109	207.194	130.30	566.10	1,729.70	1.16	63.43	121,022
0.252	210.255	34.58	41.21	93.30	0.08	10.49	8,767
0.237	187.270	29.81	75.84	233.04	0.15	20.38	16,133
0.133	188.889	35.83	133.19	358.52	0.27	20.00	28,333
0.071	188.377	32.53	182.34	428.57	0.37	14.62	38,788
0.075	188.001	52.63	282.55	633.12	0.57	24.02	60,102
0.072	183.234	93.71	517.25	1,084.41	1.05	43.14	110,028
0.070	188.733	128.93	742.46	2,018.55	1.51	58.42	157,934
0.065	187.956	232.78	1,343.95	3,477.91	2.73	99.23	285,882
0.427	279.274	57.33	45.54	116.65	0.10	15.43	10,094
0.253	258.671	30.44	98.41	288.33	0.21	21.29	21,813
0.211	256.077	63.13	191.98	667.74	0.41	35.13	42,551
0.204	250.579	88.11	254.34	998.82	0.54	45.91	56,373
0.127	252.683	95.56	434.75	1,198.92	0.92	48.48	96,360
0.098	252.690	110.84	644.07	1,455.27	1.36	55.48	142,757
0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.130	257.796	483.08	2,236.99	6,721.44	4.73	249.80	495,821
0.133	466.006	3.25	17.07	20.38	0.04	0.80	2,796
0.363	443.274	52.26	156.72	154.80	0.21	13.44	16,401
0.357	443.274	53.38	236.35	354.07	0.43	29.25	36,348
0.197	443.274	69.71	378.01	604.92	0.79	31.11	70,037
0.122	535.623	74.03	242.38	905.66	1.30	26.31	115,694
0.124	215.262	12.80	59.87	77.60	0.09	5.41	9,357
0.100	192.854	9.26	87.04	115.47	0.13	7.05	13,603
0.072	191.415	18.70	187.29	244.35	0.28	11.06	29,272
0.063	189.647	24.23	243.33	325.86	0.36	12.61	38,031
0.040	187.666	23.61	332.20	312.67	0.50	10.97	51,921
0.036	192.714	27.81	653.51	466.84	0.98	19.13	102,138
0.043	192.714	80.65	1,233.03	1,384.53	1.84	43.01	192,714
0.138	177.856	13.76	30.14	59.55	0.06	4.92	6,344
0.125	157.520	16.45	66.37	155.51	0.13	11.09	13,969
0.086	157.436	23.58	112.94	270.45	0.23	13.03	23,769
0.056	159.275	25.28	163.51	383.12	0.33	12.18	34,414

0.040	156.730	27.77	269.84	447.10	0.54	14.35	56,792
0.033	157.409	35.12	460.02	641.87	0.92	20.31	96,819
0.042	158.236	75.75	612.21	1,403.76	1.23	34.11	128,849
0.026	155.194	57.59	841.35	1,313.79	1.69	29.39	177,076
0.277	265.154	30.29	54.93	93.84	0.09	9.86	9,436
0.285	239.305	31.67	108.00	252.46	0.18	22.10	18,552
0.249	238.803	71.69	221.69	709.37	0.36	39.72	38,082
0.120	237.291	48.39	282.36	620.55	0.46	24.49	48,504
0.117	238.264	64.68	419.57	826.51	0.69	35.52	72,075
0.045	238.264	58.34	1,176.17	1,545.27	1.93	38.50	202,048
0.191	210.213	21.23	37.71	77.73	0.08	7.33	8,052
0.173	195.481	19.74	75.66	179.14	0.15	14.27	16,157
0.099	191.782	25.14	129.27	282.52	0.26	14.29	27,604
0.062	192.243	26.75	183.86	392.94	0.37	12.65	39,259
0.060	193.229	40.07	289.70	563.13	0.59	19.13	61,860
0.057	189.981	66.52	511.24	913.90	1.04	32.82	109,166
0.030	194.732	68.60	794.68	1,403.74	1.62	26.29	169,690
0.066	193.002	270.42	1,812.80	4,236.87	3.70	132.07	387,090
0.256	293.921	27.04	65.05	110.14	0.11	10.18	11,691
0.293	264.899	36.66	120.94	307.20	0.21	24.01	21,737
0.222	260.398	58.26	208.44	614.10	0.36	31.87	37,464
0.139	263.386	60.52	320.08	772.64	0.55	30.30	57,529
0.085	262.682	59.62	523.98	829.12	0.90	30.61	94,176
0.035	264.319	39.50	910.69	639.65	1.56	21.91	163,680
0.297	262.792	508.92	1,257.44	5,652.24	2.16	255.13	226,001
0.167	255.735	4.66	18.75	28.16	0.04	1.84	2,813
0.141	255.735	9.23	26.02	45.97	0.06	2.81	5,115
0.232	255.735	43.10	122.98	114.19	0.15	10.65	11,764
0.227	255.735	28.97	119.98	183.24	0.21	15.92	17,901
0.125	255.735	48.79	246.54	405.02	0.50	21.77	44,498
0.063	255.735	37.98	117.38	446.96	0.61	13.36	53,960
0.059	255.735	48.48	171.52	557.18	0.75	17.50	75,953
0.229	215.017	19.093	18.970	64.254	0.060	6.676	6265.656
0.222	196.910	30.628	51.904	240.147	0.164	19.343	17143.478
0.126	198.857	35.851	95.662	350.909	0.302	20.035	31596.195
0.100	198.401	44.194	126.755	488.208	0.400	21.182	41865.714
0.075	201.370	62.849	227.055	720.004	0.716	27.951	74993.773
0.102	201.971	142.199	401.091	1580.282	1.265	67.231	132476.125
0.078	200.232	163.654	543.930	2361.821	1.716	70.325	179654.335
0.079	202.618	327.267	1082.253	4358.263	3.414	140.232	357457.022

g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
PM	CO2	ROG	CO	NOX	SOX	PM	CO2
0.007	179.282	2.36	39.91	41.05	0.08	0.31	8,267
0.008	161.199	2.40	57.61	34.86	0.11	0.60	11,932

0.007	161.168	3.63	101.52	23.01	0.20	0.97	21,028
0.003	161.179	4.15	163.42	16.97	0.32	0.59	33,848
0.003	161.179	10.03	295.70	75.74	0.58	1.09	61,248
0.091	272.784	3.99	20.17	24.94	0.05	1.10	3,273
0.088	272.784	8.30	27.58	51.08	0.08	2.11	6,547
0.070	272.784	12.89	87.23	69.78	0.13	2.60	10,093
0.064	272.784	14.17	137.11	95.55	0.25	4.97	21,277
0.040	272.784	21.02	226.18	118.03	0.45	5.84	40,099
0.020	272.784	25.04	114.89	139.81	0.67	4.41	59,467
0.020	272.784	43.43	194.86	226.72	1.03	7.56	105,022
0.020	272.784	67.29	301.14	357.74	1.63	11.83	162,306
0.031	272.784	97.66	424.08	1,220.18	2.22	25.37	220,409
0.110	294.975	12.57	46.54	82.08	0.11	4.32	11,585
0.045	256.753	7.68	84.92	91.69	0.20	3.74	21,138
0.023	266.627	9.73	159.11	76.77	0.38	3.46	39,603
0.016	262.044	11.80	218.71	101.83	0.52	3.36	54,441
0.015	258.575	18.85	362.74	150.99	0.86	5.13	90,290
0.013	267.340	28.73	657.26	206.46	1.56	7.90	163,602
0.009	262.720	27.35	969.97	1,049.69	2.31	8.37	241,440
0.055	262.792	284.62	2,815.34	5,802.90	6.69	147.63	700,778
0.091	318.248	3.33	17.49	20.88	0.04	0.82	2,864
0.095	318.248	9.70	32.89	61.17	0.10	2.38	7,956
0.118	414.859	9.01	30.75	56.93	0.09	2.13	7,467
0.085	414.859	13.55	104.35	89.15	0.18	2.79	13,690
0.077	414.859	17.78	207.02	136.92	0.39	6.28	33,604
0.049	414.859	30.10	392.56	181.25	0.82	8.57	72,600
0.166	165.291	23.73	33.54	67.75	0.06	6.76	6,716
0.087	149.981	14.06	66.62	118.36	0.13	7.72	13,340
0.057	151.491	17.00	111.87	157.76	0.21	8.36	22,403
0.036	150.957	18.37	163.58	185.43	0.31	7.72	32,758
0.028	150.671	23.36	252.89	230.74	0.48	9.33	50,642
0.023	150.117	32.63	425.18	310.44	0.81	13.01	85,145
0.092	149.631	168.90	700.58	1,928.21	1.34	86.38	140,294
0.018	150.667	68.26	774.95	715.30	1.48	19.02	155,187
0.200	244.871	33.50	56.40	90.69	0.10	8.49	10,409
0.144	226.234	20.01	106.47	164.21	0.19	12.49	19,650
0.073	224.142	21.86	181.62	195.01	0.32	10.91	33,519
0.049	224.157	24.01	246.38	256.87	0.43	9.97	45,469
0.040	225.185	34.83	415.70	327.84	0.73	13.52	76,719
0.028	224.357	46.28	693.08	431.87	1.22	16.13	127,909
0.049	225.479	97.78	1,011.82	1,665.31	1.78	40.76	186,735
0.062	215.490	217.34	1,782.39	3,713.44	3.14	95.32	328,945
0.098	443.274	24.40	175.82	135.16	0.26	4.42	19,947
0.088	443.274	24.19	245.15	158.42	0.44	7.50	37,678
0.056	443.274	38.31	432.68	196.45	0.85	9.52	75,800
0.029	443.274	46.06	216.36	227.32	1.25	7.21	110,818
0.028	443.274	69.36	316.67	320.98	1.66	10.71	169,331
0.028	443.274	109.63	499.35	515.67	2.68	16.94	266,851
0.047	443.274	286.59	1,143.66	3,158.77	5.96	62.38	592,657
0.062	215.954	4.17	14.23	26.34	0.04	0.98	3,455
0.046	222.537	5.95	38.72	47.88	0.08	1.63	7,953
0.039	197.746	7.10	78.73	70.20	0.15	3.20	16,171

0.025	199.880	9.94	142.11	73.89	0.28	3.64	29,190
0.014	199.885	12.13	212.61	92.45	0.42	2.98	43,669
0.011	198.730	15.91	317.97	104.33	0.62	3.60	65,311
0.016	198.282	32.81	557.91	243.82	1.09	8.97	114,595
0.009	198.249	32.48	813.53	758.21	1.60	7.83	167,099
0.007	197.811	44.03	1,511.16	1,373.12	2.96	11.47	310,393
0.041	117.014	6.18	27.04	34.43	0.05	1.73	4,963
0.033	105.000	5.20	47.13	46.59	0.08	2.69	8,649
0.019	105.128	6.66	80.94	52.86	0.14	2.71	14,853
0.012	105.400	8.56	119.55	68.00	0.21	2.57	21,939
0.013	105.464	15.73	197.53	119.06	0.35	4.51	36,250
0.004	105.117	19.78	504.07	426.95	0.88	3.95	92,503
0.136	420.542	5.00	28.50	35.15	0.07	1.49	4,626
0.133	420.542	9.82	33.66	62.34	0.10	2.53	7,990
0.086	420.542	12.09	93.17	88.93	0.18	2.84	13,878
0.081	420.542	16.86	208.20	149.52	0.41	6.82	35,326
0.049	420.542	23.39	332.01	177.34	0.72	7.56	64,343
0.026	420.542	27.28	170.28	212.10	1.08	6.03	96,304
0.026	420.542	41.93	264.50	310.61	1.50	9.28	152,657
0.026	420.542	68.24	426.99	511.76	2.48	15.15	246,438
0.041	420.542	159.73	854.53	2,499.54	4.78	46.54	475,212
0.213	223.579	30.99	45.43	80.47	0.08	8.33	8,756
0.167	212.726	26.57	100.45	202.09	0.18	15.17	19,357
0.072	216.654	23.03	166.32	193.62	0.31	10.69	32,053
0.041	214.468	22.92	227.42	256.67	0.42	8.32	43,827
0.039	212.928	36.69	323.92	291.36	0.60	11.42	62,424
0.009	213.737	38.73	882.83	791.54	1.62	7.45	170,135
0.073	213.348	361.72	2,206.16	5,009.75	4.06	146.14	425,161
0.076	252.951	10.24	49.01	63.32	0.09	2.87	9,526
0.074	229.835	10.25	88.12	95.73	0.16	5.53	17,129
0.031	228.256	13.15	185.61	102.97	0.34	4.92	36,082
0.021	227.094	16.46	249.81	128.27	0.46	4.58	48,562
0.013	226.637	19.94	389.91	124.54	0.72	4.33	75,795
0.021	227.690	44.09	671.77	308.41	1.25	12.05	130,588
0.030	227.753	86.14	1,171.61	1,073.78	2.17	29.71	227,753
0.046	234.386	229.84	2,081.40	2,918.37	3.86	78.97	404,609
0.073	218.037	7.62	19.24	44.28	0.06	2.13	6,354
0.073	196.895	13.89	51.90	107.98	0.16	6.33	17,142
0.027	198.964	14.22	95.71	90.68	0.30	4.24	31,613
0.021	198.477	17.04	126.80	109.23	0.40	4.37	41,882
0.017	201.061	27.46	226.71	175.68	0.72	6.33	74,879
0.030	200.477	67.87	398.12	522.25	1.26	19.84	131,496
0.027	200.163	74.86	543.74	1,178.46	1.72	23.79	179,592
0.021	202.639	127.83	1,082.37	2,102.92	3.41	37.00	357,494
0.127	243.544	13.68	50.89	71.21	0.09	4.81	9,256
0.098	217.274	13.54	97.42	121.35	0.17	8.03	17,721
0.054	216.086	17.27	181.15	159.64	0.31	8.24	32,951
0.033	218.940	18.65	261.07	189.39	0.45	7.17	47,489
0.027	219.279	27.15	430.20	248.59	0.75	9.54	78,253
0.022	218.179	39.92	716.88	388.77	1.25	13.35	130,400
0.018	218.447	41.35	996.95	911.14	1.73	15.20	181,345
0.028	211.477	83.91	1,309.87	1,527.56	2.28	31.43	238,265

0.057	199.186	6.85	34.13	46.29	0.07	1.98	6,992
0.050	177.921	7.52	63.57	67.72	0.12	3.65	13,022
0.025	178.621	10.17	130.06	73.78	0.25	3.71	26,642
0.016	179.141	12.91	182.83	94.21	0.36	3.27	37,451
0.014	179.029	19.99	310.02	139.73	0.61	4.79	63,504
0.008	179.232	24.36	517.60	126.90	1.01	4.59	106,023
0.027	178.698	62.61	772.06	1,200.84	1.51	24.25	158,148
0.007	178.698	64.67	1,744.77	1,618.31	3.41	14.32	357,397
0.124	229.351	13.94	42.74	64.70	0.08	4.44	8,198
0.038	207.401	8.49	100.73	81.82	0.18	3.55	19,322
0.035	206.802	12.46	155.86	93.64	0.29	5.03	29,897
0.027	206.479	18.97	234.96	171.33	0.43	5.88	45,071
0.028	205.960	29.04	355.79	230.00	0.65	9.43	68,248
0.018	206.729	33.70	608.45	206.97	1.11	10.07	116,716
0.007	206.729	19.39	994.72	823.65	1.82	6.44	190,811
0.007	206.729	25.20	1,131.59	945.35	2.07	7.57	217,066
0.116	242.461	15.96	55.17	67.44	0.09	4.48	9,365
0.088	216.400	11.67	101.46	108.34	0.16	7.03	17,222
0.035	217.520	13.11	202.64	118.82	0.33	5.55	34,397
0.017	217.785	11.05	273.56	118.97	0.44	3.65	46,434
0.022	214.994	20.31	414.65	210.52	0.67	7.30	70,385
0.004	217.241	19.11	959.87	81.38	1.56	2.80	162,931
0.058	204.984	6.77	45.10	46.28	0.07	2.03	7,137
0.048	186.147	8.63	104.21	84.10	0.16	4.26	16,492
0.031	185.158	10.84	173.63	94.07	0.26	4.54	27,479
0.017	185.768	11.09	253.15	99.23	0.38	3.67	40,064
0.020	184.409	19.78	394.73	180.78	0.60	6.76	62,470
0.013	185.453	29.60	708.94	277.17	1.07	8.14	112,199
0.014	185.931	35.03	989.20	708.06	1.50	11.91	156,554
0.070	244.369	2.28	11.94	14.25	0.03	0.56	1,955
0.055	170.490	2.40	13.65	16.84	0.03	0.72	2,216
0.054	170.490	3.98	13.64	25.27	0.04	1.03	3,239
0.028	170.490	3.95	37.05	39.85	0.08	1.08	6,479
0.027	170.490	4.10	61.35	44.30	0.13	1.75	10,911
0.141	420.542	4.10	20.73	25.63	0.05	1.13	3,364
0.135	420.542	11.20	37.20	68.90	0.11	2.84	8,831
0.091	420.542	14.91	109.67	101.06	0.20	3.38	15,560
0.086	420.542	18.07	211.42	151.56	0.41	7.21	35,326
0.052	420.542	24.88	332.66	177.91	0.71	7.89	63,502
0.027	420.542	27.96	163.83	204.50	1.03	5.96	91,258
0.027	420.542	46.61	274.23	322.88	1.54	9.90	156,442
0.027	420.542	77.52	453.37	544.94	2.60	16.58	258,633
0.043	420.542	220.98	1,117.74	3,263.60	6.17	62.09	613,991
0.072	218.623	8.69	42.11	51.20	0.07	2.58	7,800
0.056	197.029	9.27	92.40	92.65	0.16	4.90	17,114
0.023	196.200	7.98	152.30	71.44	0.27	3.26	28,209
0.026	196.824	15.03	226.61	158.16	0.40	5.57	41,973
0.034	198.648	27.60	359.15	278.44	0.64	11.32	66,522
0.004	196.512	20.29	552.23	139.56	0.98	1.91	102,285
0.067	233.779	11.34	60.12	69.45	0.11	3.15	11,054
0.023	210.683	5.88	110.37	74.11	0.19	2.26	20,294
0.016	210.002	5.61	148.00	54.39	0.26	2.01	27,214

0.014	210.589	10.42	238.56	123.95	0.42	2.92	43,867
0.004	207.781	10.42	422.49	71.52	0.74	1.34	77,687
0.004	210.233	30.48	714.57	338.29	1.25	2.42	131,396
0.050	227.855	8.54	44.32	59.27	0.09	2.07	9,475
0.174	209.328	23.74	79.89	180.72	0.16	14.22	17,079
0.110	207.369	32.97	145.19	296.70	0.30	16.53	31,040
0.073	207.838	34.82	205.11	341.14	0.42	15.37	43,850
0.072	209.944	61.02	347.70	564.09	0.71	25.52	74,331
0.078	207.148	102.78	565.98	1,231.53	1.16	45.28	120,995
0.104	210.123	15.93	41.19	67.39	0.08	4.32	8,761
0.080	187.107	12.96	75.78	104.07	0.15	6.87	16,119
0.036	188.529	13.97	132.94	102.22	0.27	5.45	28,279
0.022	188.301	15.36	182.27	134.54	0.37	4.50	38,772
0.023	187.791	25.35	282.23	196.82	0.57	7.30	60,035
0.026	186.329	51.29	525.99	408.73	1.07	15.67	111,886
0.026	189.327	63.57	744.80	1,072.85	1.51	21.63	158,431
0.033	187.939	139.72	1,343.83	2,299.78	2.73	50.46	285,856
0.413	279.274	56.46	45.54	111.50	0.10	14.91	10,094
0.200	257.970	24.47	98.15	229.11	0.21	16.86	21,754
0.080	255.890	28.20	191.84	253.00	0.41	13.34	42,520
0.064	250.836	34.24	254.60	327.08	0.54	14.45	56,431
0.047	252.703	47.10	434.78	455.67	0.92	18.01	96,368
0.039	251.946	60.70	642.18	595.90	1.36	22.00	142,337
0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
0.044	257.796	205.93	2,236.99	3,720.80	4.73	84.78	495,821
0.133	466.006	3.25	17.07	20.38	0.04	0.80	2,796
0.089	443.274	16.18	122.59	105.69	0.21	3.30	16,401
0.082	443.274	18.95	222.23	148.10	0.43	6.75	36,348
0.051	443.274	28.31	375.58	175.91	0.79	8.07	70,037
0.032	535.622	37.77	212.27	230.99	1.30	7.01	115,694
0.033	215.472	5.86	59.93	53.59	0.09	1.42	9,366
0.023	193.037	4.00	87.12	50.64	0.13	1.63	13,616
0.019	191.391	7.69	187.27	69.82	0.28	2.96	29,269
0.015	188.489	8.70	241.84	100.00	0.36	3.06	37,798
0.003	187.666	6.58	332.20	26.10	0.50	0.91	51,921
0.040	192.714	37.56	653.51	479.74	0.98	21.03	102,138
0.011	192.714	28.33	1,233.03	842.65	1.84	11.33	192,714
0.035	179.044	3.75	30.34	40.01	0.06	1.25	6,386
0.043	158.786	7.03	66.90	77.08	0.13	3.81	14,081
0.036	157.014	10.86	112.63	112.15	0.23	5.47	23,705
0.021	159.359	11.98	163.60	145.68	0.33	4.62	34,432
0.017	157.073	15.29	270.43	161.44	0.54	6.11	56,916
0.010	157.985	18.30	461.70	175.56	0.93	6.39	97,173
0.016	158.265	33.26	612.32	734.46	1.23	12.97	128,873
0.010	155.194	31.55	841.35	773.35	1.69	11.00	177,076
0.109	265.154	12.66	54.93	66.13	0.09	3.87	9,436
0.086	239.305	12.27	108.00	109.44	0.18	6.66	18,552
0.049	238.803	20.24	221.69	163.71	0.36	7.79	38,082
0.023	237.291	16.02	282.36	150.27	0.46	4.71	48,504
0.037	238.264	30.10	419.57	328.60	0.69	11.29	72,075
0.008	238.264	23.02	1,176.17	878.79	1.93	7.02	202,048
0.061	209.777	8.71	37.63	53.19	0.08	2.34	8,036

0.039	194.623	7.25	75.33	69.68	0.15	3.20	16,086
0.025	191.631	9.77	129.17	73.01	0.26	3.63	27,582
0.020	191.840	13.20	183.47	112.21	0.37	4.10	39,177
0.016	191.909	18.56	287.72	137.23	0.59	5.23	61,438
0.031	190.503	48.94	512.65	469.12	1.05	18.09	109,466
0.019	194.331	46.26	793.04	949.08	1.62	16.51	169,340
0.022	193.002	133.79	1,812.80	2,336.64	3.70	43.83	387,090
0.099	293.392	12.56	64.93	76.64	0.11	3.93	11,670
0.160	264.783	21.33	120.89	189.39	0.21	13.10	21,727
0.094	260.386	27.50	208.43	265.12	0.36	13.50	37,462
0.073	263.789	35.79	320.57	382.27	0.55	15.96	57,617
0.040	261.645	36.13	521.91	334.86	0.90	14.40	93,804
0.005	264.141	20.96	910.08	94.70	1.56	2.85	163,569
0.314	262.792	530.84	1,257.44	5,787.35	2.16	269.83	226,001
0.086	255.735	3.43	17.33	21.43	0.04	0.94	2,813
0.082	255.735	6.49	21.54	39.90	0.06	1.65	5,115
0.064	255.735	13.88	95.12	79.64	0.15	2.92	11,764
0.058	255.735	11.00	112.43	79.40	0.21	4.08	17,901
0.036	255.735	21.34	244.58	129.35	0.50	6.26	44,498
0.018	255.735	20.62	101.61	125.53	0.61	3.89	53,960
0.018	255.735	28.45	138.13	162.10	0.75	5.31	75,953
0.073	218.037	7.624	19.237	44.284	0.061	2.131	6353.682
0.073	196.895	13.895	51.900	107.984	0.164	6.328	17142.173
0.027	198.964	14.218	95.713	90.677	0.302	4.245	31613.174
0.021	198.477	17.039	126.803	109.230	0.400	4.369	41881.675
0.017	201.061	27.460	226.706	175.675	0.715	6.325	74878.664
0.030	200.477	67.866	398.124	522.247	1.256	19.836	131496.223
0.027	200.163	74.863	543.740	1178.464	1.715	23.788	179591.867
0.021	202.639	127.831	1082.366	2102.924	3.414	36.998	357494.391

2014

AvgHP		2014		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
		Equipment	MaxHP	ROG	CO	NOX	SOX	PM
0	46	Aerial Lifts	50	0.084	0.866	1.262	0.002	0.049
50	74		120	0.065	0.778	1.039	0.002	0.050
120	130		175	0.063	0.778	0.994	0.002	0.041
175	210		250	0.353	0.778	3.641	0.002	0.189
250	380		500	0.076	0.778	1.418	0.002	0.031
0	12	Air Compressor	15	0.426	1.784	2.604	0.004	0.163
15	24		25	0.458	1.328	2.397	0.003	0.139
25	37		50	0.990	2.959	2.600	0.004	0.242
50	78		120	0.431	1.861	2.686	0.003	0.237
120	147		175	0.297	1.549	2.380	0.003	0.130
175	218		250	0.194	0.592	2.107	0.003	0.064
250	385		500	0.179	0.597	1.843	0.003	0.060
500	595		750	0.181	0.597	1.910	0.003	0.061
750	808		1000	0.213	0.711	2.643	0.003	0.075
0	39	Bore/Drill Rigs	50	0.439	1.209	2.680	0.003	0.192
50	82		120	0.168	1.025	2.108	0.002	0.125
120	149		175	0.162	1.071	2.043	0.003	0.093
175	208		250	0.114	1.047	1.771	0.002	0.053
250	349		500	0.106	1.034	1.601	0.002	0.051
500	612		750	0.083	1.073	1.193	0.003	0.040
750	919		1000	0.055	1.056	1.500	0.003	0.029
1000	2667		9999	0.090	1.056	2.133	0.003	0.052
0	9	Cement and Mortar	15	0.373	1.943	2.347	0.005	0.099
15	25		25	0.469	1.439	2.685	0.004	0.142
0	18	Concrete/Industrial	25	0.500	1.708	3.163	0.005	0.120
25	33		50	1.190	3.882	3.777	0.005	0.310
50	81		120	0.548	2.684	3.771	0.005	0.302
120	175		175	0.378	2.249	3.312	0.005	0.167
0	41	Cranes	50	0.638	0.826	1.755	0.002	0.175
50	89		120	0.375	0.749	2.968	0.001	0.220
120	148		175	0.239	0.757	2.440	0.001	0.132
175	217		250	0.199	0.754	2.265	0.001	0.104
250	336		500	0.146	0.752	1.805	0.001	0.075
500	567		750	0.084	0.751	1.247	0.001	0.043
750	938		1000	0.314	0.748	3.347	0.001	0.166
1000	1030		9999	0.036	0.752	0.657	0.001	0.016
0	43	Crawler Tractors	50	1.131	1.328	2.743	0.002	0.319
50	87		120	0.397	1.228	3.226	0.002	0.269
120	150		175	0.282	1.215	2.948	0.002	0.160
175	203		250	0.204	1.218	2.675	0.002	0.103
250	341		500	0.185	1.224	2.408	0.002	0.093
500	570		750	0.156	1.218	2.099	0.002	0.077
750	828		1000	0.213	1.223	3.184	0.002	0.094



1000	1527		9999	0.151	1.168	2.585	0.002	0.068
0	45	Crushing/Proc	50	1.573	4.850	4.213	0.006	0.387
50	85		120	0.686	3.042	4.269	0.005	0.376
120	171		175	0.478	2.540	3.768	0.005	0.208
175	250		250	0.316	0.958	3.312	0.005	0.102
250	382		500	0.294	0.960	2.890	0.004	0.095
500	602		750	0.295	0.951	2.997	0.004	0.096
750	1337		9999	0.356	1.139	4.204	0.004	0.121
0	16	Dumpers/Tend	25	0.268	0.898	1.685	0.003	0.076
0	36	Excavators	50	0.330	1.083	1.896	0.002	0.145
50	82		120	0.205	0.962	1.960	0.002	0.146
120	146		175	0.156	0.973	1.779	0.002	0.087
175	218		250	0.118	0.974	1.670	0.002	0.053
250	329		500	0.093	0.970	1.280	0.002	0.041
500	578		750	0.095	0.964	1.352	0.002	0.044
750	843		1000	0.124	0.969	2.109	0.002	0.056
1000	1569		9999	0.081	0.963	1.373	0.002	0.035
0	42	Forklifts	50	0.445	0.638	1.207	0.001	0.132
50	82		120	0.167	0.572	1.377	0.001	0.115
120	141		175	0.122	0.573	1.277	0.001	0.069
175	208		250	0.129	0.574	1.462	0.001	0.066
250	344		500	0.114	0.575	1.277	0.001	0.058
500	880		1000	0.327	0.573	3.140	0.001	0.175
0	11	Generator Set	15	0.578	2.750	3.959	0.007	0.221
15	19		25	0.605	2.048	3.695	0.005	0.201
25	33		50	1.048	3.455	3.731	0.005	0.288
50	84		120	0.532	2.612	3.801	0.005	0.285
120	153		175	0.358	2.178	3.368	0.005	0.156
175	229		250	0.229	0.833	2.972	0.005	0.082
250	363		500	0.206	0.852	2.656	0.004	0.077
500	586		750	0.213	0.852	2.747	0.004	0.078
750	1130		9999	0.286	1.011	3.807	0.004	0.102
0	39	Graders	50	1.323	1.157	2.677	0.002	0.354
50	91		120	0.543	1.106	4.081	0.002	0.340
120	148		175	0.362	1.133	3.557	0.002	0.200
175	204		250	0.167	1.121	2.346	0.002	0.076
250	293		500	0.134	1.111	1.518	0.002	0.058
500	796		1000	0.303	1.109	3.798	0.002	0.132
1000	1993		9999	0.187	1.107	2.679	0.002	0.081
0	38	Off-Highway T	50	0.740	1.299	2.454	0.002	0.242
50	75		120	0.318	1.181	2.735	0.002	0.224
120	158		175	0.193	1.175	2.188	0.002	0.112
175	214		250	0.184	1.166	2.465	0.002	0.088
250	334		500	0.128	1.170	1.716	0.002	0.061
500	574		750	0.121	1.172	1.745	0.002	0.058
750	1000		1000	0.039	1.172	0.993	0.002	0.024
1000	1726		9999	0.179	1.198	2.531	0.002	0.081
0	29	Off-Highway T	50	0.662	0.651	2.220	0.002	0.231
50	87		120	0.268	0.596	2.157	0.002	0.175
120	159		175	0.205	0.602	1.993	0.002	0.112
175	211		250	0.193	0.600	2.078	0.002	0.090
250	372		500	0.157	0.610	1.789	0.002	0.069

500	656		750	0.194	0.610	2.130	0.002	0.088
750	897		1000	0.166	0.605	2.431	0.002	0.072
1000	1764		9999	0.167	0.608	2.244	0.002	0.070
0	38	Other Constru	50	0.565	1.338	2.312	0.002	0.209
50	82		120	0.317	1.191	2.755	0.002	0.215
120	152		175	0.246	1.189	2.647	0.002	0.138
175	217		250	0.176	1.203	2.397	0.002	0.088
250	357		500	0.143	1.204	1.895	0.002	0.070
500	598		750	0.107	1.196	1.607	0.002	0.051
750	830		1000	0.096	1.192	1.844	0.002	0.048
1000	1127		9999	0.123	1.168	2.041	0.002	0.056
0	35	Other General	50	0.544	0.972	1.908	0.002	0.186
50	73		120	0.282	0.869	2.297	0.002	0.196
120	149		175	0.187	0.872	1.979	0.002	0.107
175	209		250	0.174	0.875	2.102	0.002	0.087
250	355		500	0.127	0.874	1.560	0.002	0.059
500	592		750	0.091	0.875	1.238	0.002	0.039
750	885		1000	0.124	0.872	2.180	0.002	0.057
1000	2000		9999	0.077	0.872	1.491	0.002	0.039
0	36	Other Material	50	0.701	1.196	2.273	0.002	0.227
50	93		120	0.231	1.081	2.124	0.002	0.163
120	145		175	0.219	1.078	2.292	0.002	0.124
175	218		250	0.197	1.076	2.440	0.002	0.096
250	331		500	0.137	1.074	1.722	0.002	0.067
500	565		750	0.095	1.078	1.364	0.002	0.046
750	923		1000	0.021	1.078	0.892	0.002	0.007
1000	1050		9999	0.058	1.078	1.358	0.002	0.026
0	39	Pavers	50	0.825	1.429	2.375	0.002	0.247
50	80		120	0.297	1.274	2.575	0.002	0.201
120	158		175	0.218	1.280	2.383	0.002	0.119
175	213		250	0.090	1.285	1.720	0.002	0.044
250	327		500	0.078	1.269	1.266	0.002	0.042
500	750		750	0.072	1.280	1.010	0.002	0.043
0	35	Paving Equipn	50	0.391	1.293	1.841	0.002	0.155
50	89		120	0.252	1.177	2.262	0.002	0.173
120	148		175	0.154	1.170	1.852	0.002	0.088
175	216		250	0.115	1.174	1.698	0.002	0.056
250	339		500	0.117	1.166	1.639	0.002	0.058
500	605		750	0.081	1.174	1.399	0.002	0.032
750	842		1000	0.081	1.175	1.624	0.002	0.039
0	8	Plate Compac	15	0.284	1.492	1.781	0.004	0.069
0	13	Pressure Was	15	0.234	1.115	1.605	0.003	0.089
15	19		25	0.245	0.830	1.498	0.002	0.082
25	38		50	0.327	1.183	1.460	0.002	0.100
50	64		120	0.189	1.010	1.471	0.002	0.099
0	8	Pumps	15	0.656	2.750	4.014	0.007	0.251
15	21		25	0.706	2.048	3.695	0.005	0.215
25	37		50	1.130	3.636	3.775	0.005	0.302
50	84		120	0.553	2.653	3.859	0.005	0.298
120	151		175	0.374	2.212	3.420	0.005	0.164
175	217		250	0.240	0.848	3.020	0.005	0.085
250	372		500	0.216	0.870	2.688	0.004	0.080

500	615		750	0.223	0.870	2.781	0.004	0.081
750	1460		9999	0.294	1.031	3.851	0.004	0.104
0	36	Rollers	50	0.514	1.181	2.023	0.002	0.181
50	87		120	0.273	1.064	2.398	0.002	0.179
120	144		175	0.144	1.059	1.772	0.002	0.082
175	213		250	0.150	1.062	2.027	0.002	0.072
250	335		500	0.148	1.070	1.945	0.002	0.076
500	521		750	0.241	1.061	3.227	0.002	0.120
0	47	Rough Terrain	50	0.497	1.273	2.101	0.002	0.175
50	96		120	0.148	1.145	1.796	0.002	0.105
120	130		175	0.093	1.142	1.445	0.002	0.056
175	208		250	0.078	1.146	1.199	0.002	0.035
250	374		500	0.072	1.132	1.407	0.002	0.031
500	625		750	0.033	1.143	0.526	0.002	0.004
0	42	Rubber Tired L	50	1.225	1.059	2.630	0.002	0.347
50	82		120	0.510	0.975	3.785	0.002	0.339
120	150		175	0.397	0.970	3.887	0.002	0.222
175	211		250	0.298	0.973	3.151	0.002	0.155
250	354		500	0.293	0.982	3.185	0.002	0.149
500	584		750	0.212	0.969	2.825	0.002	0.102
0	42	Rubber Tired L	50	0.801	0.987	2.208	0.002	0.244
50	86		120	0.329	0.878	2.579	0.002	0.224
120	150		175	0.229	0.888	2.269	0.002	0.127
175	206		250	0.154	0.885	1.988	0.002	0.068
250	320		500	0.159	0.882	1.879	0.002	0.071
500	600		750	0.154	0.860	1.740	0.002	0.069
750	837		1000	0.157	0.887	2.421	0.002	0.071
1000	1521		9999	0.157	0.884	2.302	0.002	0.066
0	36	Scrapers	50	1.609	1.260	3.241	0.003	0.432
50	84		120	0.363	1.168	3.408	0.002	0.254
120	166		175	0.363	1.155	3.814	0.002	0.202
175	225		250	0.375	1.130	4.252	0.002	0.194
250	381		500	0.242	1.140	3.007	0.002	0.121
500	565		750	0.186	1.140	2.418	0.002	0.091
750	950		1000	0.593	1.138	6.460	0.002	0.301
1000	1923		9999	0.257	1.163	3.528	0.002	0.132
0	6	Signal Boards	15	0.542	2.845	3.397	0.007	0.133
15	37		50	1.271	4.083	4.010	0.006	0.330
50	82		120	0.594	2.854	4.049	0.005	0.324
120	158		175	0.407	2.386	3.579	0.005	0.179
175	216		250	0.319	1.093	3.794	0.006	0.110
0	43	Skid Steer Loa	50	0.256	1.377	1.673	0.002	0.105
50	71		120	0.117	1.234	1.479	0.002	0.086
120	153		175	0.117	1.224	1.531	0.002	0.070
175	201		250	0.097	1.215	1.355	0.002	0.049
250	277		500	0.087	1.201	1.132	0.002	0.040
500	530		750	0.055	1.233	0.884	0.002	0.037
750	1000		1000	0.085	1.233	1.412	0.002	0.044
0	36	Surfacing Equ	50	0.360	0.845	1.636	0.002	0.131
50	89		120	0.176	0.749	1.664	0.002	0.118
120	151		175	0.149	0.748	1.722	0.002	0.082
175	216		250	0.097	0.756	1.538	0.002	0.045

250	362		500	0.075	0.745	1.174	0.001	0.038
500	615		750	0.055	0.749	0.990	0.002	0.031
750	814		1000	0.094	0.752	1.729	0.002	0.042
1000	1141		9999	0.051	0.737	1.155	0.001	0.026
0	36	Sweepers/Scrubbers	50	0.843	1.544	2.620	0.003	0.275
50	78		120	0.397	1.393	3.159	0.002	0.278
120	159		175	0.417	1.390	4.150	0.002	0.229
175	204		250	0.241	1.381	3.054	0.002	0.121
250	303		500	0.218	1.387	2.744	0.002	0.119
500	848		1000	0.076	1.387	1.837	0.002	0.047
0	38	Tractors/Loaders	50	0.515	0.985	1.978	0.002	0.180
50	83		120	0.225	0.914	2.057	0.002	0.162
120	144		175	0.163	0.898	1.820	0.002	0.092
175	204		250	0.126	0.900	1.814	0.002	0.058
250	320		500	0.120	0.903	1.654	0.002	0.056
500	575		750	0.118	0.893	1.564	0.002	0.057
750	871		1000	0.065	0.912	1.399	0.002	0.031
1000	2006		9999	0.131	0.904	2.033	0.002	0.063
0	40	Trenchers	50	0.667	1.635	2.741	0.003	0.252
50	82		120	0.430	1.474	3.627	0.003	0.283
120	144		175	0.364	1.449	3.869	0.002	0.199
175	218		250	0.261	1.465	3.258	0.003	0.130
250	359		500	0.161	1.454	2.196	0.002	0.081
500	619		750	0.062	1.471	0.917	0.003	0.031
750	860		1000	0.594	1.462	6.588	0.003	0.298
0	11	Welders	15	0.399	1.672	2.441	0.004	0.153
15	20		25	0.429	1.245	2.247	0.003	0.131
25	46		50	0.849	2.579	2.386	0.003	0.212
50	70		120	0.380	1.697	2.461	0.003	0.208
120	174		175	0.260	1.413	2.181	0.003	0.114
175	211		250	0.169	0.541	1.929	0.003	0.058
250	297		500	0.154	0.549	1.698	0.003	0.054
0	29	Water Trucks	50	0.662	0.651	2.220	0.002	0.231
50	87		120	0.268	0.596	2.157	0.002	0.175
120	159		175	0.205	0.602	1.993	0.002	0.112
175	211		250	0.193	0.600	2.078	0.002	0.090
250	372		500	0.157	0.610	1.789	0.002	0.069
500	656		750	0.194	0.610	2.130	0.002	0.088
750	897		1000	0.166	0.605	2.431	0.002	0.072
1000	1764		9999	0.167	0.608	2.244	0.002	0.070

2025

AvgHP

0  
50

2025		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
Equipment	MaxHP	ROG	CO	NOX	SOX	PM
Aerial Lifts	50	0.050	0.866	0.887	0.002	0.006
	120	0.032	0.778	0.466	0.002	0.008

120	130		175	0.027	0.778	0.176	0.002	0.007
175	210		250	0.021	0.778	0.081	0.002	0.003
250	380		500	0.027	0.778	0.200	0.002	0.003
0	12	Air Compressors	15	0.329	1.677	2.059	0.004	0.089
15	24		25	0.342	1.142	2.119	0.003	0.086
25	37		50	0.327	2.345	1.833	0.004	0.061
50	78		120	0.172	1.757	1.153	0.003	0.055
120	147		175	0.135	1.541	0.717	0.003	0.034
175	218		250	0.109	0.526	0.562	0.003	0.017
250	385		500	0.108	0.505	0.516	0.003	0.017
500	595		750	0.108	0.505	0.527	0.003	0.017
750	808		1000	0.115	0.520	1.447	0.003	0.028
0	39	Bore/Drill Rigs	50	0.311	1.192	1.999	0.003	0.097
50	82		120	0.081	1.028	0.987	0.002	0.034
120	149		175	0.060	1.070	0.446	0.003	0.019
175	208		250	0.056	1.053	0.481	0.003	0.016
250	349		500	0.053	1.045	0.414	0.002	0.014
500	612		750	0.044	1.076	0.300	0.003	0.011
750	919		1000	0.033	1.055	1.150	0.003	0.009
1000	2667		9999	0.108	1.056	2.179	0.003	0.056
0	9	Cement and Mortar	15	0.370	1.943	2.320	0.005	0.091
15	25		25	0.386	1.313	2.440	0.004	0.094
0	18	Concrete/Industrial	25	0.500	1.708	3.163	0.005	0.118
25	33		50	0.384	3.138	2.622	0.005	0.073
50	81		120	0.207	2.552	1.589	0.005	0.066
120	175		175	0.161	2.243	0.913	0.005	0.042
0	41	Cranes	50	0.546	0.825	1.624	0.002	0.156
50	89		120	0.140	0.748	1.191	0.001	0.075
120	148		175	0.101	0.757	0.911	0.001	0.048
175	217		250	0.080	0.754	0.772	0.001	0.033
250	336		500	0.066	0.752	0.621	0.001	0.025
500	567		750	0.052	0.750	0.472	0.001	0.020
750	938		1000	0.152	0.747	1.808	0.001	0.076
1000	1030		9999	0.069	0.752	0.698	0.001	0.019
0	43	Crawler Tractors	50	0.783	1.329	2.116	0.002	0.196
50	87		120	0.204	1.226	1.699	0.002	0.122
120	150		175	0.134	1.214	1.152	0.002	0.064
175	203		250	0.104	1.214	1.056	0.002	0.041
250	341		500	0.093	1.220	0.823	0.002	0.035
500	570		750	0.075	1.216	0.662	0.002	0.024
750	828		1000	0.116	1.224	1.972	0.002	0.048
1000	1527		9999	0.065	1.168	1.458	0.002	0.026
0	45	Crushing/Processing	50	0.512	3.887	2.919	0.006	0.084
50	85		120	0.270	2.882	1.754	0.005	0.075
120	171		175	0.211	2.533	1.015	0.005	0.047
175	250		250	0.175	0.864	0.790	0.005	0.024
250	382		500	0.173	0.828	0.731	0.004	0.024
500	602		750	0.174	0.828	0.745	0.004	0.024
750	1337		9999	0.204	0.848	2.270	0.004	0.042
0	16	Dumpers/Tenders	25	0.261	0.889	1.646	0.003	0.061
0	36	Excavators	50	0.161	1.083	1.319	0.002	0.041
50	82		120	0.080	0.961	0.795	0.002	0.033

120	146		175	0.063	0.973	0.441	0.002	0.022
175	218		250	0.052	0.973	0.367	0.002	0.012
250	329		500	0.046	0.969	0.277	0.002	0.010
500	578		750	0.056	0.965	0.392	0.002	0.015
750	843		1000	0.037	0.965	0.896	0.002	0.009
1000	1569		9999	0.028	0.963	0.875	0.002	0.007
0	42	Forklifts	50	0.134	0.638	0.790	0.001	0.036
50	82		120	0.058	0.572	0.524	0.001	0.028
120	141		175	0.044	0.573	0.332	0.001	0.017
175	208		250	0.040	0.574	0.295	0.001	0.011
250	344		500	0.045	0.575	0.333	0.001	0.012
500	880		1000	0.024	0.573	0.489	0.001	0.005
0	11	Generator Set	15	0.451	2.585	3.168	0.007	0.133
15	19		25	0.515	1.761	3.267	0.005	0.131
25	33		50	0.340	2.804	2.619	0.005	0.075
50	84		120	0.188	2.476	1.678	0.005	0.070
120	153		175	0.143	2.172	1.036	0.005	0.043
175	229		250	0.113	0.742	0.814	0.005	0.023
250	363		500	0.110	0.727	0.751	0.004	0.022
500	586		750	0.111	0.727	0.767	0.004	0.022
750	1130		9999	0.134	0.748	2.122	0.004	0.037
0	39	Graders	50	0.797	1.160	2.061	0.002	0.213
50	91		120	0.273	1.100	2.074	0.002	0.152
120	148		175	0.141	1.124	1.134	0.002	0.062
175	204		250	0.098	1.112	1.045	0.002	0.034
250	293		500	0.120	1.106	0.926	0.002	0.036
500	796		1000	0.052	1.109	1.003	0.002	0.010
1000	1993		9999	0.095	1.107	1.622	0.002	0.037
0	38	Off-Highway T	50	0.236	1.301	1.605	0.002	0.061
50	75		120	0.126	1.184	1.179	0.002	0.063
120	158		175	0.080	1.175	0.587	0.002	0.028
175	214		250	0.070	1.169	0.486	0.002	0.017
250	334		500	0.056	1.167	0.313	0.002	0.011
500	574		750	0.076	1.171	0.487	0.002	0.020
750	1000		1000	0.090	1.172	1.081	0.002	0.030
1000	1726		9999	0.089	1.148	1.240	0.002	0.026
0	29	Off-Highway T	50	0.268	0.660	1.516	0.002	0.070
50	87		120	0.137	0.596	1.084	0.002	0.061
120	159		175	0.085	0.602	0.510	0.002	0.025
175	211		250	0.074	0.601	0.431	0.002	0.016
250	372		500	0.071	0.608	0.406	0.002	0.015
500	656		750	0.094	0.610	0.669	0.002	0.025
750	897		1000	0.075	0.606	1.197	0.002	0.022
1000	1764		9999	0.064	0.614	1.109	0.002	0.017
0	38	Other Constru	50	0.329	1.338	1.789	0.002	0.111
50	82		120	0.148	1.196	1.351	0.002	0.084
120	152		175	0.102	1.189	0.900	0.002	0.047
175	217		250	0.083	1.205	0.799	0.002	0.031
250	357		500	0.073	1.205	0.645	0.002	0.025
500	598		750	0.062	1.198	0.567	0.002	0.020
750	830		1000	0.052	1.201	1.102	0.002	0.018
1000	1127		9999	0.056	1.163	1.146	0.002	0.019

0	35	Other General	50	0.176	0.972	1.270	0.002	0.047
50	73		120	0.092	0.869	0.833	0.002	0.040
120	149		175	0.068	0.872	0.466	0.002	0.024
175	209		250	0.055	0.875	0.351	0.002	0.012
250	355		500	0.054	0.874	0.360	0.002	0.012
500	592		750	0.042	0.875	0.215	0.002	0.008
750	885		1000	0.073	0.872	1.362	0.002	0.028
1000	2000		9999	0.035	0.872	0.817	0.002	0.007
0	36	Other Material	50	0.308	1.196	1.673	0.002	0.094
50	93		120	0.084	1.081	0.812	0.002	0.032
120	145		175	0.078	1.078	0.552	0.002	0.029
175	218		250	0.083	1.076	0.701	0.002	0.024
250	331		500	0.084	1.074	0.633	0.002	0.026
500	565		750	0.062	1.078	0.368	0.002	0.018
750	923		1000	0.021	1.078	0.892	0.002	0.007
1000	1050		9999	0.027	1.078	0.908	0.002	0.007
0	39	Pavers	50	0.399	1.428	1.716	0.002	0.110
50	80		120	0.136	1.274	1.274	0.002	0.079
120	158		175	0.078	1.281	0.683	0.002	0.032
175	213		250	0.047	1.284	0.430	0.002	0.014
250	327		500	0.050	1.263	0.471	0.002	0.016
500	750		750	0.027	1.280	0.109	0.002	0.004
0	35	Paving Equipn	50	0.177	1.295	1.288	0.002	0.050
50	89		120	0.090	1.177	0.886	0.002	0.042
120	148		175	0.065	1.169	0.536	0.002	0.027
175	216		250	0.050	1.174	0.394	0.002	0.015
250	339		500	0.049	1.165	0.402	0.002	0.015
500	605		750	0.031	1.172	0.184	0.002	0.004
750	842		1000	0.044	1.175	0.845	0.002	0.014
0	8	Plate Compac	15	0.284	1.492	1.781	0.004	0.070
0	13	Pressure Was	15	0.183	1.048	1.284	0.003	0.054
15	19		25	0.209	0.714	1.324	0.002	0.053
25	38		50	0.096	0.968	1.019	0.002	0.025
50	64		120	0.059	0.957	0.653	0.002	0.023
0	8	Pumps	15	0.507	2.585	3.175	0.007	0.137
15	21		25	0.527	1.761	3.267	0.005	0.133
25	37		50	0.375	2.944	2.655	0.005	0.080
50	84		120	0.202	2.515	1.700	0.005	0.074
120	151		175	0.155	2.205	1.053	0.005	0.045
175	217		250	0.123	0.753	0.828	0.005	0.024
250	372		500	0.120	0.735	0.762	0.004	0.023
500	615		750	0.120	0.735	0.778	0.004	0.023
750	1460		9999	0.144	0.758	2.144	0.004	0.039
0	36	Rollers	50	0.223	1.181	1.384	0.002	0.063
50	87		120	0.100	1.063	1.010	0.002	0.051
120	144		175	0.050	1.059	0.413	0.002	0.019
175	213		250	0.068	1.063	0.669	0.002	0.025
250	335		500	0.083	1.072	0.825	0.002	0.034
500	521		750	0.040	1.061	0.269	0.002	0.004
0	47	Rough Terrain	50	0.192	1.272	1.398	0.002	0.051
50	96		120	0.058	1.146	0.732	0.002	0.021
120	130		175	0.037	1.142	0.316	0.002	0.012

175	208		250	0.052	1.145	0.599	0.002	0.014
250	374		500	0.029	1.130	0.192	0.002	0.004
500	625		750	0.050	1.143	0.543	0.002	0.004
0	42	Rubber Tired L	50	0.216	1.066	1.442	0.002	0.050
50	82		120	0.275	0.979	2.077	0.002	0.162
120	150		175	0.191	0.971	1.672	0.002	0.091
175	211		250	0.154	0.972	1.504	0.002	0.066
250	354		500	0.152	0.981	1.332	0.002	0.060
500	584		750	0.177	0.969	2.108	0.002	0.078
0	42	Rubber Tired L	50	0.364	0.987	1.573	0.002	0.094
50	86		120	0.133	0.880	1.075	0.002	0.065
120	150		175	0.085	0.886	0.575	0.002	0.030
175	206		250	0.067	0.885	0.522	0.002	0.018
250	320		500	0.073	0.884	0.518	0.002	0.019
500	600		750	0.080	0.876	0.598	0.002	0.023
750	837		1000	0.063	0.890	1.117	0.002	0.019
1000	1521		9999	0.094	0.884	1.521	0.002	0.033
0	36	Scrapers	50	1.571	1.260	3.092	0.003	0.414
50	84		120	0.286	1.163	2.654	0.002	0.195
120	166		175	0.146	1.155	1.269	0.002	0.066
175	225		250	0.147	1.132	1.352	0.002	0.060
250	381		500	0.109	1.139	0.989	0.002	0.039
500	565		750	0.093	1.138	0.826	0.002	0.031
750	950		1000	0.593	1.138	6.460	0.002	0.301
1000	1923		9999	0.110	1.163	1.939	0.002	0.044
0	6	Signal Boards	15	0.542	2.845	3.397	0.007	0.133
15	37		50	0.408	3.290	2.778	0.006	0.077
50	82		120	0.218	2.707	1.700	0.005	0.070
120	158		175	0.168	2.378	0.985	0.005	0.044
175	216		250	0.167	0.981	0.931	0.006	0.028
0	43	Skid Steer Loa	50	0.132	1.379	1.219	0.002	0.031
50	71		120	0.054	1.235	0.688	0.002	0.021
120	153		175	0.042	1.225	0.369	0.002	0.014
175	201		250	0.045	1.207	0.504	0.002	0.015
250	277		500	0.025	1.201	0.095	0.002	0.003
500	530		750	0.072	1.233	0.907	0.002	0.040
750	1000		1000	0.029	1.233	0.846	0.002	0.011
0	36	Surfacing Equ	50	0.074	0.851	1.078	0.002	0.025
50	89		120	0.073	0.757	0.802	0.002	0.037
120	151		175	0.059	0.748	0.603	0.002	0.028
175	216		250	0.047	0.757	0.527	0.002	0.017
250	362		500	0.040	0.746	0.400	0.002	0.015
500	615		750	0.027	0.747	0.232	0.002	0.008
750	814		1000	0.042	0.752	0.904	0.002	0.016
1000	1141		9999	0.029	0.737	0.680	0.001	0.010
0	36	Sweepers/Scr	50	0.297	1.544	1.757	0.003	0.087
50	78		120	0.145	1.393	1.284	0.002	0.073
120	159		175	0.102	1.390	0.746	0.002	0.033
175	204		250	0.081	1.381	0.736	0.002	0.023
250	303		500	0.102	1.387	1.087	0.002	0.037
500	848		1000	0.030	1.387	1.045	0.002	0.009
0	38	Tractors/Load	50	0.212	0.982	1.349	0.002	0.053



50	83		120	0.081	0.912	0.777	0.002	0.031
120	144		175	0.062	0.897	0.435	0.002	0.022
175	204		250	0.059	0.900	0.455	0.002	0.017
250	320		500	0.056	0.900	0.385	0.002	0.015
500	575		750	0.072	0.892	0.608	0.002	0.025
750	871		1000	0.052	0.910	1.085	0.002	0.019
1000	2006		9999	0.062	0.904	1.108	0.002	0.019
0	40	Trenchers	50	0.285	1.633	1.838	0.003	0.082
50	82		120	0.240	1.474	2.150	0.003	0.143
120	144		175	0.188	1.449	1.783	0.002	0.090
175	218		250	0.161	1.468	1.666	0.003	0.072
250	359		500	0.100	1.457	0.918	0.003	0.040
500	619		750	0.035	1.470	0.153	0.003	0.005
750	860		1000	0.617	1.462	6.729	0.003	0.314
0	11	Welders	15	0.308	1.572	1.931	0.004	0.083
15	20		25	0.320	1.071	1.986	0.003	0.081
25	46		50	0.282	2.055	1.683	0.003	0.055
50	70		120	0.148	1.605	1.067	0.003	0.050
120	174		175	0.116	1.407	0.664	0.003	0.031
175	211		250	0.093	0.481	0.522	0.003	0.016
250	297		500	0.092	0.464	0.479	0.003	0.015
0	29	Water Trucks	50	0.268	0.660	1.516	0.002	0.070
50	87		120	0.137	0.596	1.084	0.002	0.061
120	159		175	0.085	0.602	0.510	0.002	0.025
175	211		250	0.074	0.601	0.431	0.002	0.016
250	372		500	0.071	0.608	0.406	0.002	0.015
500	656		750	0.094	0.610	0.669	0.002	0.025
750	897		1000	0.075	0.606	1.197	0.002	0.022
1000	1764		9999	0.064	0.614	1.109	0.002	0.017

g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
CO2	ROG	CO	NOX	SOX	PM	CO2
179.282	3.87	39.91	58.20	0.08	2.24	8,267
161.199	4.83	57.61	76.94	0.11	3.67	11,932
161.168	8.18	101.52	129.69	0.20	5.33	21,028
161.179	74.23	163.42	764.62	0.32	39.73	33,848
161.179	28.95	295.70	539.00	0.58	11.85	61,248
272.784	5.11	21.40	31.24	0.05	1.95	3,273
272.784	10.98	31.88	57.52	0.08	3.34	6,547
272.784	36.64	109.49	96.19	0.13	8.95	10,093
272.784	33.63	145.19	209.51	0.25	18.49	21,277
272.784	43.68	227.67	349.80	0.45	19.14	40,099
272.784	42.26	129.00	459.25	0.67	14.04	59,467
272.784	68.79	229.73	709.50	1.03	23.08	105,022
272.784	107.61	355.04	1,136.28	1.63	36.44	162,306
272.784	172.00	574.24	2,135.63	2.22	60.79	220,410
300.841	17.23	47.47	105.23	0.11	7.54	11,815
255.023	13.81	84.35	173.56	0.20	10.31	20,996
266.563	24.05	159.07	303.46	0.38	13.88	39,594
260.604	23.74	217.51	367.95	0.52	10.95	54,141
257.459	37.06	361.17	559.06	0.86	17.71	89,900
267.167	50.50	656.84	729.80	1.56	24.75	163,496
262.773	50.75	970.17	1,378.17	2.31	26.92	241,488
262.792	239.99	2,815.34	5,688.68	6.69	138.02	700,778
318.248	3.36	17.49	21.12	0.04	0.89	2,864
318.248	11.73	35.98	67.13	0.10	3.55	7,956
414.859	9.01	30.75	56.93	0.09	2.16	7,467
414.859	39.26	128.11	124.65	0.18	10.24	13,690
414.859	44.41	217.40	305.44	0.39	24.43	33,604
414.859	66.20	393.62	579.62	0.82	29.29	72,600
165.356	25.91	33.55	71.32	0.06	7.11	6,718
149.906	33.39	66.58	263.98	0.13	19.60	13,334
151.505	35.38	111.88	360.89	0.21	19.47	22,405
150.972	43.23	163.60	491.41	0.31	22.52	32,761
150.650	48.94	252.85	606.57	0.48	25.14	50,635
150.367	47.87	425.89	707.12	0.81	24.63	85,287
149.777	294.57	701.26	3,138.24	1.34	155.54	140,431
150.667	37.40	774.95	676.80	1.48	16.14	155,187
245.052	48.10	56.45	116.58	0.10	13.55	10,417
226.628	34.44	106.66	280.24	0.19	23.41	19,684
224.148	42.20	181.63	440.88	0.32	24.00	33,520
224.856	41.33	247.14	542.54	0.44	20.97	45,611
225.932	63.01	417.08	820.44	0.74	31.73	76,973
224.780	88.72	694.38	1,196.58	1.22	43.65	128,150
225.711	176.65	1,012.86	2,637.02	1.79	77.48	186,926

215.490	230.91	1,782.39	3,946.69	3.14	103.70	328,945
443.274	70.80	218.25	189.57	0.26	17.40	19,947
443.274	58.31	258.54	362.90	0.44	32.00	37,678
443.274	81.81	434.38	644.25	0.85	35.50	75,800
443.274	79.09	239.55	827.95	1.25	25.48	110,818
443.274	112.46	366.62	1,104.04	1.66	36.30	169,331
443.274	177.80	572.42	1,804.38	2.68	58.04	266,851
443.274	476.18	1,523.38	5,621.32	5.96	161.75	592,657
215.954	4.29	14.37	26.96	0.04	1.22	3,455
222.387	11.79	38.69	67.76	0.08	5.19	7,948
197.661	16.77	78.70	160.26	0.15	11.94	16,164
199.826	22.77	142.08	259.73	0.28	12.77	29,183
199.987	25.69	212.71	364.93	0.42	11.58	43,692
199.172	30.56	318.68	420.81	0.63	13.56	65,456
197.908	55.14	556.86	781.53	1.09	25.23	114,379
199.067	104.14	816.89	1,777.95	1.60	47.34	167,789
197.811	126.65	1,511.16	2,153.77	2.96	55.59	310,393
117.014	18.86	27.04	51.20	0.05	5.59	4,963
105.000	13.77	47.13	113.38	0.08	9.50	8,649
105.128	17.18	80.94	180.39	0.14	9.80	14,853
105.400	26.91	119.55	304.42	0.21	13.81	21,939
105.464	39.14	197.53	438.88	0.35	19.97	36,250
105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
420.542	6.35	30.25	43.55	0.07	2.43	4,626
420.542	11.50	38.91	70.20	0.10	3.82	7,990
420.542	34.59	114.01	123.14	0.18	9.49	13,878
420.542	44.66	219.41	319.28	0.41	23.90	35,326
420.542	54.78	333.31	515.30	0.72	23.93	64,343
420.542	52.45	190.83	680.61	1.08	18.75	96,304
420.542	74.61	309.44	964.11	1.50	27.89	152,657
420.542	124.78	499.54	1,609.91	2.48	45.93	246,438
420.542	323.37	1,141.99	4,302.01	4.78	115.52	475,212
223.039	51.82	45.32	104.83	0.08	13.88	8,734
213.218	49.40	100.68	371.37	0.19	30.94	19,402
218.369	53.59	167.64	526.18	0.31	29.53	32,307
216.092	34.07	229.14	479.40	0.42	15.48	44,159
214.043	39.39	325.61	444.97	0.60	17.10	62,751
213.737	241.58	882.83	3,023.02	1.62	105.21	170,135
213.348	372.66	2,206.16	5,338.90	4.06	161.02	425,161
252.522	27.85	48.92	92.43	0.09	9.12	9,510
229.599	23.71	88.03	203.86	0.16	16.66	17,112
228.426	30.56	185.75	345.95	0.34	17.74	36,109
226.753	39.44	249.44	527.19	0.46	18.92	48,489
227.491	42.70	391.38	573.98	0.73	20.24	76,081
227.870	69.68	672.31	1,000.72	1.25	33.21	130,692
227.753	38.55	1,171.61	992.67	2.17	23.64	227,753
232.835	309.79	2,067.62	4,368.71	3.84	139.88	401,931
215.124	19.28	18.98	64.69	0.06	6.73	6,269
196.908	23.33	51.90	187.82	0.16	15.23	17,143
198.724	32.56	95.60	316.70	0.30	17.73	31,575
198.251	40.73	126.66	438.48	0.40	18.98	41,834
201.430	58.56	227.12	666.44	0.72	25.53	75,016

201.497	127.11	400.15	1,397.30	1.26	57.80	132,165
199.838	148.65	542.86	2,181.10	1.71	64.16	179,301
200.921	294.93	1,073.19	3,957.97	3.38	123.83	354,462
243.447	21.49	50.87	87.87	0.09	7.93	9,253
216.672	25.83	97.15	224.73	0.17	17.54	17,672
216.364	37.56	181.38	403.62	0.32	21.11	32,993
218.806	38.24	260.91	520.00	0.45	19.13	47,460
219.052	51.13	429.75	676.10	0.75	24.91	78,171
217.638	63.70	715.10	960.37	1.24	30.73	130,076
216.891	79.39	989.84	1,530.69	1.72	40.17	180,053
212.401	138.25	1,315.59	2,299.20	2.29	63.10	239,305
199.186	19.09	34.13	66.97	0.07	6.52	6,992
177.921	20.64	63.57	168.14	0.12	14.35	13,022
178.621	27.87	130.06	295.18	0.25	15.89	26,642
179.141	36.46	182.83	439.52	0.36	18.18	37,451
179.029	45.01	310.02	553.29	0.61	20.90	63,504
179.232	54.10	517.60	732.11	1.01	23.32	106,023
178.698	109.60	772.06	1,928.99	1.51	50.43	158,148
178.698	153.65	1,744.77	2,981.23	3.41	77.12	357,397
229.351	25.07	42.74	81.27	0.08	8.13	8,198
207.401	21.50	100.73	197.84	0.18	15.18	19,322
206.802	31.60	155.86	331.32	0.29	17.87	29,897
206.479	42.91	234.96	532.62	0.43	20.89	45,071
205.960	45.43	355.79	570.67	0.65	22.12	68,248
206.729	53.73	608.45	770.36	1.11	26.13	116,716
206.729	19.39	994.72	823.65	1.82	6.44	190,811
206.729	61.34	1,131.59	1,426.29	2.07	27.60	217,066
242.630	31.87	55.21	91.73	0.09	9.54	9,372
216.291	23.64	101.41	204.92	0.16	15.96	17,213
217.286	34.54	202.43	376.81	0.33	18.84	34,360
218.118	19.27	273.97	366.70	0.44	9.31	46,505
215.371	25.63	415.38	414.42	0.67	13.76	70,508
217.241	54.31	959.87	757.86	1.56	32.46	162,931
204.701	13.63	45.03	64.09	0.07	5.40	7,127
186.223	22.29	104.25	200.40	0.16	15.28	16,499
185.130	22.90	173.60	274.86	0.26	13.11	27,474
185.800	24.85	253.19	366.25	0.38	12.13	40,071
184.485	39.51	394.89	555.35	0.60	19.78	62,496
185.770	49.02	710.15	846.63	1.07	19.48	112,391
185.931	68.35	989.20	1,367.16	1.50	33.07	156,554
244.369	2.28	11.94	14.25	0.03	0.56	1,955
170.490	3.04	14.49	20.87	0.03	1.16	2,216
170.490	4.66	15.77	28.46	0.04	1.55	3,239
170.490	12.41	44.94	55.49	0.08	3.78	6,479
170.490	12.13	64.61	94.15	0.13	6.36	10,911
420.542	5.25	22.00	32.11	0.05	2.01	3,364
420.542	14.82	43.01	77.59	0.11	4.51	8,831
420.542	41.79	134.53	139.67	0.20	11.16	15,560
420.542	46.48	222.84	324.14	0.41	25.01	35,326
420.542	56.48	333.95	516.35	0.71	24.73	63,502
420.542	52.18	183.94	655.29	1.03	18.49	91,258
420.542	80.54	323.70	1,000.11	1.54	29.64	156,442

420.542	137.35	535.15	1,710.56	2.60	50.00	258,633
420.542	429.57	1,505.89	5,623.16	6.17	152.35	613,991
218.686	18.33	42.12	72.20	0.07	6.47	7,802
197.034	23.71	92.40	208.27	0.16	15.51	17,115
196.200	20.77	152.30	254.83	0.27	11.82	28,209
196.664	31.92	226.42	432.34	0.40	15.32	41,938
198.274	49.68	358.47	651.25	0.63	25.32	66,397
196.512	125.70	552.23	1,679.69	0.98	62.55	102,285
234.126	23.52	60.21	99.34	0.11	8.29	11,071
210.487	14.21	110.27	172.99	0.19	10.11	20,276
210.011	12.07	148.01	187.25	0.26	7.27	27,216
210.693	16.32	238.68	249.85	0.42	7.29	43,889
208.207	26.76	423.35	526.02	0.74	11.44	77,846
210.233	20.67	714.57	328.54	1.25	2.23	131,396
226.500	50.96	44.06	109.36	0.09	14.41	9,419
208.499	41.59	79.57	308.78	0.16	27.64	17,011
207.409	59.50	145.22	581.87	0.30	33.30	31,045
208.079	62.96	205.35	664.88	0.42	32.73	43,900
209.946	103.60	347.70	1,127.80	0.71	52.58	74,332
207.191	124.00	566.09	1,650.22	1.16	59.49	121,020
210.043	33.39	41.17	92.07	0.08	10.19	8,758
186.783	28.31	75.64	222.21	0.15	19.29	16,091
188.892	34.37	133.20	340.37	0.27	19.01	28,333
188.323	31.70	182.29	409.39	0.37	13.92	38,777
187.698	50.98	282.09	600.80	0.57	22.64	60,005
183.005	92.33	516.60	1,045.09	1.05	41.30	109,890
188.723	131.07	742.42	2,026.21	1.51	59.04	157,926
187.956	239.07	1,343.95	3,501.37	2.73	101.03	285,882
279.274	58.17	45.54	117.13	0.10	15.62	10,094
258.778	30.61	98.45	287.41	0.21	21.41	21,822
255.959	60.25	191.89	633.82	0.41	33.57	42,531
250.432	84.27	254.19	956.66	0.54	43.73	56,340
252.633	92.17	434.66	1,146.64	0.92	46.25	96,341
252.649	105.21	643.97	1,366.06	1.36	51.65	142,734
252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
257.796	494.61	2,236.99	6,786.14	4.73	254.47	495,821
466.006	3.25	17.07	20.38	0.04	0.80	2,796
443.274	47.01	151.08	148.38	0.21	12.21	16,401
443.274	48.69	234.03	332.03	0.43	26.54	36,348
443.274	64.27	376.97	565.49	0.79	28.22	70,037
535.623	68.96	236.19	819.41	1.30	23.82	115,694
215.258	11.14	59.87	72.74	0.09	4.58	9,357
192.872	8.27	87.04	104.31	0.13	6.10	13,604
191.378	17.88	187.26	234.10	0.28	10.67	29,267
189.834	19.55	243.57	271.79	0.36	9.78	38,068
187.666	24.16	332.20	313.13	0.50	11.02	51,921
192.714	29.13	653.51	468.59	0.98	19.39	102,138
192.714	84.82	1,233.03	1,411.68	1.84	44.22	192,714
177.845	12.84	30.14	58.34	0.06	4.67	6,343
157.584	15.64	66.40	147.60	0.13	10.45	13,975
157.426	22.49	112.93	259.98	0.23	12.41	23,768
159.144	20.87	163.38	332.35	0.33	9.73	34,385

156.753	27.10	269.88	425.55	0.54	13.71	56,800
157.578	33.72	460.52	609.07	0.93	19.13	96,923
158.240	76.46	612.22	1,408.17	1.23	34.38	128,852
155.194	58.49	841.35	1,317.34	1.69	29.66	177,076
265.154	29.99	54.93	93.25	0.09	9.77	9,436
239.305	30.78	108.00	244.91	0.18	21.56	18,552
238.803	66.57	221.69	661.74	0.36	36.56	38,082
237.291	49.19	282.36	624.33	0.46	24.71	48,504
238.264	65.95	419.57	829.96	0.69	35.86	72,075
238.264	64.11	1,176.17	1,558.01	1.93	39.63	202,048
210.397	19.73	37.74	75.78	0.08	6.89	8,059
195.093	18.56	75.51	169.97	0.15	13.35	16,125
191.689	23.48	129.21	261.90	0.26	13.17	27,591
192.168	25.75	183.79	370.38	0.37	11.95	39,244
192.895	38.55	289.20	529.48	0.59	17.91	61,753
190.737	67.52	513.28	898.53	1.05	32.53	109,601
194.717	56.82	794.62	1,218.73	1.62	27.04	169,676
193.002	261.75	1,812.80	4,077.30	3.70	125.55	387,090
293.866	26.52	65.04	109.04	0.11	10.00	11,689
264.892	35.31	120.94	297.59	0.21	23.21	21,736
260.508	52.41	208.53	556.61	0.36	28.57	37,479
263.342	57.06	320.03	711.69	0.55	28.30	57,520
261.320	57.67	521.27	787.31	0.89	29.02	93,688
264.328	38.32	910.72	567.89	1.56	19.07	163,685
262.792	511.09	1,257.44	5,665.62	2.16	256.59	226,001
255.735	4.39	18.39	26.85	0.04	1.68	2,813
255.735	8.58	24.91	44.94	0.06	2.61	5,115
255.735	39.05	118.61	109.74	0.15	9.75	11,764
255.735	26.62	118.82	172.24	0.21	14.56	17,901
255.735	45.29	245.86	379.44	0.50	19.90	44,498
255.735	35.62	114.26	407.03	0.61	12.16	53,960
255.735	45.74	163.19	504.16	0.75	15.94	75,953
215.124	19.282	18.980	64.692	0.060	6.731	6268.796
196.908	23.331	51.904	187.822	0.164	15.227	17143.315
198.724	32.562	95.598	316.700	0.302	17.726	31575.081
198.251	40.732	126.658	438.481	0.399	18.977	41834.003
201.430	58.564	227.122	666.437	0.716	25.535	75016.172
201.497	127.106	400.149	1397.301	1.262	57.797	132165.272
199.838	148.654	542.859	2181.097	1.712	64.161	179300.608
200.921	294.932	1073.186	3957.969	3.385	123.827	354462.314

g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
CO2	ROG	CO	NOX	SOX	PM	CO2
179.282	2.29	39.91	40.91	0.08	0.29	8,267
161.199	2.36	57.61	34.46	0.11	0.59	11,932

161.168	3.57	101.52	22.99	0.20	0.97	21,028
161.179	4.33	163.42	17.03	0.32	0.59	33,848
161.179	10.42	295.70	76.00	0.58	1.10	61,248
272.784	3.95	20.12	24.71	0.05	1.07	3,273
272.784	8.20	27.41	50.85	0.08	2.06	6,547
272.784	12.12	86.78	67.81	0.13	2.26	10,093
272.784	13.42	137.07	89.92	0.25	4.27	21,277
272.784	19.83	226.53	105.37	0.45	5.00	40,099
272.784	23.85	114.73	122.49	0.67	3.74	59,467
272.784	41.46	194.53	198.73	1.03	6.42	105,022
272.784	64.22	300.63	313.59	1.63	10.04	162,306
272.784	92.85	419.97	1,168.82	2.22	22.92	220,409
296.620	12.20	46.80	78.50	0.11	3.81	11,649
255.986	6.69	84.67	81.24	0.20	2.79	21,075
266.249	8.89	158.88	66.27	0.38	2.89	39,547
262.012	11.73	218.69	99.92	0.52	3.28	54,434
260.139	18.66	364.93	144.40	0.87	4.94	90,836
267.910	27.18	658.67	183.36	1.57	6.96	163,951
262.715	30.16	969.95	1,057.16	2.31	8.59	241,435
262.792	287.37	2,815.34	5,809.95	6.69	148.22	700,778
318.248	3.33	17.49	20.88	0.04	0.82	2,864
318.248	9.65	32.82	61.01	0.10	2.35	7,956
414.859	9.01	30.75	56.93	0.09	2.13	7,467
414.859	12.67	103.54	86.53	0.18	2.40	13,690
414.859	16.76	206.72	128.72	0.39	5.32	33,604
414.859	28.23	392.59	159.70	0.82	7.27	72,600
165.291	22.19	33.54	65.97	0.06	6.35	6,716
149.862	12.43	66.56	105.97	0.13	6.67	13,330
151.527	14.90	111.90	134.65	0.21	7.09	22,408
150.963	17.32	163.59	167.63	0.31	7.13	32,759
150.639	22.13	252.83	208.60	0.48	8.51	50,631
150.099	29.36	425.14	267.60	0.81	11.07	85,135
149.638	142.34	700.62	1,695.45	1.34	71.38	140,301
150.667	71.04	774.95	718.77	1.48	19.28	155,187
245.186	33.26	56.48	89.97	0.10	8.31	10,423
226.187	17.70	106.45	147.53	0.19	10.61	19,646
224.029	19.98	181.53	172.34	0.32	9.62	33,502
224.044	21.16	246.25	214.11	0.43	8.36	45,446
225.177	31.79	415.69	280.50	0.73	11.76	76,716
224.417	42.72	693.26	377.58	1.22	13.86	127,943
225.881	96.45	1,013.62	1,632.83	1.79	39.59	187,067
215.490	98.58	1,782.39	2,226.29	3.14	40.07	328,945
443.274	23.06	174.89	131.35	0.26	3.77	19,947
443.274	22.94	244.99	149.08	0.44	6.35	37,678
443.274	36.03	433.07	173.59	0.85	8.03	75,800
443.274	43.81	216.08	197.56	1.25	6.08	110,818
443.274	66.11	316.21	279.35	1.66	9.05	169,331
443.274	104.54	498.62	448.53	2.68	14.32	266,851
443.274	272.88	1,133.68	3,034.68	5.96	56.14	592,657
215.954	4.17	14.23	26.34	0.04	0.98	3,455
222.451	5.76	38.70	47.13	0.08	1.47	7,950
197.472	6.56	78.62	65.04	0.15	2.66	16,149

199.909	9.21	142.14	64.34	0.28	3.15	29,195
199.935	11.42	212.66	80.27	0.42	2.64	43,680
198.976	15.13	318.36	91.17	0.62	3.23	65,392
198.242	32.09	557.80	226.39	1.09	8.38	114,572
198.258	31.27	813.56	754.87	1.60	7.74	167,106
197.811	43.80	1,511.16	1,372.52	2.96	11.45	310,393
117.014	5.68	27.04	33.52	0.05	1.52	4,963
105.000	4.80	47.13	43.17	0.08	2.31	8,649
105.128	6.20	80.94	46.94	0.14	2.39	14,853
105.400	8.34	119.55	61.35	0.21	2.35	21,939
105.464	15.53	197.53	114.58	0.35	4.26	36,250
105.117	21.08	504.07	430.42	0.88	4.05	92,503
420.542	4.96	28.43	34.85	0.07	1.47	4,626
420.542	9.78	33.46	62.07	0.10	2.49	7,990
420.542	11.24	92.53	86.43	0.18	2.48	13,878
420.542	15.81	207.98	140.93	0.41	5.89	35,326
420.542	21.92	332.25	158.51	0.72	6.53	64,343
420.542	25.92	169.87	186.30	1.08	5.17	96,304
420.542	39.99	263.85	272.69	1.50	7.96	152,657
420.542	65.01	425.95	449.36	2.48	13.01	246,438
420.542	151.28	845.63	2,397.56	4.78	42.14	475,212
223.462	31.23	45.41	80.71	0.08	8.35	8,751
212.044	24.83	100.12	188.70	0.18	13.81	19,295
216.659	20.81	166.33	167.73	0.31	9.20	32,054
214.378	20.11	227.32	213.50	0.42	6.87	43,809
213.148	35.06	324.25	271.37	0.60	10.54	62,489
213.737	41.19	882.83	798.11	1.62	7.65	170,135
213.348	188.67	2,206.16	3,232.96	4.06	72.90	425,161
252.904	8.88	49.00	60.44	0.09	2.30	9,525
230.101	9.37	88.22	87.88	0.16	4.67	17,149
228.355	12.63	185.69	92.84	0.34	4.45	36,097
227.177	15.06	249.91	103.95	0.46	3.73	48,580
226.837	18.71	390.25	104.69	0.72	3.58	75,862
227.686	43.73	671.76	279.26	1.25	11.25	130,586
227.753	90.33	1,171.61	1,080.93	2.17	30.25	227,753
223.084	154.14	1,981.03	2,140.18	3.68	45.25	385,099
217.904	7.82	19.22	44.17	0.06	2.04	6,350
196.947	11.91	51.91	94.40	0.16	5.31	17,147
198.854	13.57	95.66	81.03	0.30	3.93	31,596
198.483	15.59	126.81	90.97	0.40	3.48	41,883
200.955	26.39	226.59	151.30	0.71	5.41	74,839
201.524	61.68	400.20	438.50	1.26	16.53	132,183
200.278	67.11	544.05	1,074.29	1.72	19.41	179,695
202.777	113.61	1,083.10	1,957.12	3.42	30.31	357,737
243.426	12.51	50.86	67.98	0.09	4.23	9,252
217.560	12.10	97.55	110.19	0.17	6.88	17,745
216.223	15.56	181.26	137.29	0.31	7.10	32,972
219.101	18.04	261.26	173.27	0.45	6.73	47,524
219.193	26.13	430.03	230.13	0.75	8.81	78,222
217.926	37.07	716.04	338.59	1.24	11.87	130,248
218.513	43.11	997.25	915.15	1.73	15.34	181,399
211.462	63.53	1,309.77	1,291.71	2.28	21.25	238,248



199.186	6.18	34.13	44.59	0.07	1.63	6,992
177.921	6.74	63.57	61.00	0.12	2.95	13,022
178.621	10.08	130.06	69.51	0.25	3.58	26,642
179.141	11.57	182.83	73.44	0.36	2.59	37,451
179.029	19.22	310.02	127.67	0.61	4.28	63,504
179.232	24.76	517.60	127.14	1.01	4.60	106,023
178.698	64.26	772.06	1,205.22	1.51	24.38	158,148
178.698	70.26	1,744.77	1,633.21	3.41	14.77	357,397
229.351	11.01	42.74	59.81	0.08	3.37	8,198
207.401	7.83	100.73	75.69	0.18	2.97	19,322
206.802	11.31	155.86	79.77	0.29	4.14	29,897
206.479	18.04	234.96	153.03	0.43	5.18	45,071
205.960	27.94	355.79	209.73	0.65	8.73	68,248
206.729	35.27	608.45	207.83	1.11	10.17	116,716
206.729	19.39	994.72	823.65	1.82	6.44	190,811
206.729	28.34	1,131.59	953.71	2.07	7.82	217,066
242.460	15.42	55.17	66.28	0.09	4.25	9,365
216.249	10.86	101.39	101.42	0.16	6.30	17,210
217.439	12.41	202.57	107.99	0.33	5.06	34,385
217.899	9.92	273.70	91.66	0.44	2.99	46,459
214.401	16.34	413.51	154.15	0.67	5.31	70,191
217.241	20.47	959.87	81.83	1.56	2.84	162,931
204.960	6.16	45.09	44.84	0.07	1.75	7,136
186.245	7.95	104.26	78.54	0.16	3.71	16,501
185.088	9.66	173.56	79.52	0.26	3.93	27,468
185.777	10.68	253.16	84.97	0.38	3.33	40,066
184.429	16.62	394.77	136.12	0.60	4.99	62,477
185.431	19.01	708.86	111.27	1.07	2.13	112,186
185.931	36.69	989.20	711.61	1.50	12.08	156,554
244.369	2.28	11.94	14.25	0.03	0.56	1,955
170.490	2.38	13.62	16.70	0.03	0.70	2,216
170.490	3.96	13.56	25.16	0.04	1.01	3,239
170.490	3.65	36.80	38.72	0.08	0.93	6,479
170.490	3.80	61.27	41.80	0.13	1.50	10,911
420.542	4.06	20.68	25.40	0.05	1.10	3,364
420.542	11.06	36.98	68.60	0.11	2.79	8,831
420.542	13.88	108.91	98.22	0.20	2.96	15,560
420.542	16.98	211.22	142.81	0.41	6.23	35,326
420.542	23.37	332.95	159.01	0.71	6.82	63,502
420.542	26.60	163.45	179.62	1.03	5.11	91,258
420.542	44.51	273.57	283.47	1.54	8.50	156,442
420.542	73.97	452.28	478.52	2.60	14.22	258,633
420.542	209.95	1,106.01	3,129.73	6.17	56.28	613,991
218.700	7.97	42.13	49.38	0.07	2.24	7,803
196.965	8.71	92.37	87.71	0.16	4.41	17,109
196.182	7.15	152.29	59.39	0.27	2.67	28,207
196.894	14.48	226.69	142.62	0.40	5.24	41,988
198.512	27.82	358.90	276.42	0.63	11.37	66,477
196.512	21.03	552.23	140.06	0.98	1.92	102,285
233.825	9.07	60.13	66.09	0.11	2.43	11,056
210.671	5.57	110.36	70.50	0.19	1.98	20,293
209.975	4.76	147.98	40.96	0.26	1.56	27,211

210.622	10.73	238.60	124.68	0.42	2.97	43,874
207.778	10.81	422.48	71.64	0.74	1.35	77,686
210.233	31.32	714.57	339.12	1.25	2.43	131,396
227.844	9.00	44.32	59.96	0.09	2.07	9,475
209.337	22.42	79.89	169.49	0.16	13.21	17,080
207.627	28.55	145.37	250.22	0.30	13.64	31,078
207.833	32.46	205.11	317.38	0.42	13.89	43,848
209.811	53.73	347.48	471.59	0.71	21.08	74,284
207.143	103.40	565.96	1,231.47	1.16	45.29	120,992
209.994	15.16	41.16	65.60	0.08	3.90	8,756
187.143	11.48	75.79	92.58	0.15	5.58	16,122
188.571	12.70	132.97	86.30	0.27	4.56	28,285
188.335	13.83	182.30	107.43	0.37	3.61	38,779
188.043	23.37	282.61	165.70	0.57	6.07	60,115
186.403	48.26	526.20	359.35	1.07	13.90	111,931
189.371	52.43	744.97	935.08	1.51	15.76	158,468
187.939	142.83	1,343.83	2,313.52	2.73	50.84	285,855
279.274	56.79	45.54	111.74	0.10	14.98	10,094
257.789	24.11	98.08	223.84	0.21	16.47	21,739
255.964	24.34	191.89	210.89	0.41	10.96	42,532
250.886	33.07	254.65	304.23	0.54	13.61	56,443
252.539	41.63	434.50	377.22	0.92	14.85	96,306
252.312	52.38	643.11	466.81	1.36	17.48	142,544
252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
257.796	210.90	2,236.99	3,728.75	4.73	85.39	495,821
466.006	3.25	17.07	20.38	0.04	0.80	2,796
443.274	15.09	121.73	102.78	0.21	2.84	16,401
443.274	17.85	222.00	139.42	0.43	5.74	36,348
443.274	26.59	375.79	155.60	0.79	6.88	70,037
535.623	35.99	211.89	201.10	1.30	5.96	115,694
215.497	5.72	59.94	53.01	0.09	1.34	9,367
192.949	3.80	87.08	48.54	0.13	1.47	13,610
191.401	6.39	187.28	56.36	0.28	2.17	29,270
188.596	8.95	241.98	101.02	0.36	3.10	37,820
187.666	6.90	332.20	26.20	0.50	0.92	51,921
192.714	38.20	653.51	480.58	0.98	21.16	102,138
192.714	29.31	1,233.03	845.55	1.84	11.23	192,714
179.081	2.64	30.35	38.46	0.06	0.88	6,387
159.249	6.50	67.10	71.10	0.13	3.32	14,122
157.336	8.91	112.86	90.98	0.23	4.29	23,754
159.364	10.08	163.60	113.83	0.33	3.58	34,433
157.083	14.62	270.45	144.95	0.54	5.57	56,920
157.173	16.55	459.33	142.43	0.92	4.94	96,673
158.312	33.80	612.51	736.33	1.23	13.02	128,911
155.194	32.80	841.35	775.82	1.69	11.11	177,076
265.154	10.56	54.93	62.51	0.09	3.10	9,436
239.305	11.21	108.00	99.51	0.18	5.64	18,552
238.803	16.22	221.69	119.02	0.36	5.24	38,082
237.291	16.56	282.36	150.48	0.46	4.72	48,504
238.264	30.76	419.57	328.95	0.69	11.33	72,075
238.264	25.73	1,176.17	885.99	1.93	7.23	202,048
209.757	8.13	37.63	51.69	0.08	2.05	8,035

194.810	6.65	75.40	64.24	0.15	2.60	16,101
191.601	8.98	129.15	62.61	0.26	3.10	27,578
192.119	12.14	183.74	92.91	0.37	3.56	39,234
192.247	17.83	288.23	123.37	0.59	4.64	61,546
190.427	41.52	512.44	349.10	1.04	14.26	109,423
194.225	45.25	792.61	945.36	1.62	16.47	169,248
193.002	124.49	1,812.80	2,222.71	3.70	38.82	387,090
293.469	11.34	64.95	73.09	0.11	3.26	11,673
264.933	19.70	120.96	176.44	0.21	11.75	21,739
260.385	27.09	208.43	256.58	0.36	12.95	37,462
263.828	35.23	320.62	363.87	0.55	15.81	57,626
261.893	36.01	522.41	328.99	0.90	14.17	93,893
264.145	21.70	910.09	94.99	1.56	2.87	163,572
262.792	530.84	1,257.44	5,787.35	2.16	269.83	226,001
255.735	3.39	17.29	21.24	0.04	0.92	2,813
255.735	6.41	21.42	39.73	0.06	1.61	5,115
255.735	12.96	94.51	77.41	0.15	2.54	11,764
255.735	10.38	112.36	74.72	0.21	3.51	17,901
255.735	20.12	244.88	115.47	0.50	5.38	44,498
255.735	19.66	101.42	110.06	0.61	3.32	53,960
255.735	27.20	137.86	142.19	0.75	4.54	75,953
217.904	7.819	19.225	44.166	0.061	2.038	6349.807
196.947	11.906	51.914	94.400	0.164	5.307	17146.715
198.854	13.569	95.660	81.032	0.302	3.931	31595.675
198.483	15.592	126.806	90.971	0.400	3.478	41882.845
200.955	26.386	226.586	151.298	0.715	5.407	74839.188
201.524	61.685	400.203	438.505	1.262	16.535	132182.940
200.278	67.107	544.053	1074.287	1.716	19.411	179695.284
202.777	113.609	1083.099	1957.119	3.416	30.306	357736.549

2015

AvgHP

0  
50  
120  
175  
250  
0  
15  
25  
50  
120  
175  
250  
500  
750  
0  
50  
120  
175  
250  
500  
750  
1000  
0  
15  
0  
25  
50  
120  
0  
50  
120  
175  
250  
500  
750  
1000  
0  
50  
120  
175  
250  
500  
750

46  
74  
130  
210  
380  
12  
24  
37  
78  
147  
218  
385  
595  
808  
39  
82  
149  
208  
349  
612  
919  
2667  
9  
25  
18  
33  
81  
175  
41  
89  
148  
217  
336  
567  
938  
1030  
43  
87  
150  
203  
341  
570  
828

2015		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr
Equipment	MaxHP	ROG	CO	NOX	SOX	PM
Aerial Lifts	50	0.080	0.866	1.212	0.002	0.042
	120	0.061	0.778	0.960	0.002	0.044
	175	0.058	0.778	0.835	0.002	0.036
	250	0.354	0.778	3.646	0.002	0.189
	500	0.077	0.778	1.424	0.002	0.032
Air Compressor	15	0.402	1.753	2.487	0.004	0.149
	25	0.427	1.275	2.345	0.003	0.129
	50	0.893	2.860	2.506	0.004	0.220
	120	0.394	1.843	2.488	0.003	0.214
	175	0.273	1.545	2.157	0.003	0.118
	250	0.183	0.578	1.902	0.003	0.058
	500	0.170	0.573	1.654	0.003	0.054
	750	0.172	0.573	1.718	0.003	0.056
	1000	0.196	0.653	2.475	0.003	0.068
Bore/Drill Rigs	50	0.445	1.208	2.665	0.003	0.191
	120	0.167	1.026	2.024	0.002	0.120
	175	0.159	1.068	1.962	0.003	0.088
	250	0.112	1.046	1.671	0.002	0.050
	500	0.105	1.032	1.509	0.002	0.048
	750	0.085	1.075	1.194	0.003	0.041
	1000	0.057	1.055	1.504	0.003	0.029
	9999	0.094	1.056	2.142	0.003	0.053
Cement and Mortar	15	0.372	1.943	2.334	0.005	0.096
	25	0.454	1.417	2.639	0.004	0.134
Concrete/Industrial	25	0.500	1.708	3.163	0.005	0.119
	50	1.076	3.774	3.644	0.005	0.283
	120	0.500	2.663	3.500	0.005	0.273
	175	0.348	2.247	3.007	0.005	0.152
Cranes	50	0.629	0.826	1.750	0.002	0.173
	120	0.366	0.749	2.898	0.001	0.215
	175	0.236	0.757	2.399	0.001	0.130
	250	0.194	0.754	2.196	0.001	0.100
	500	0.143	0.752	1.764	0.001	0.073
	750	0.086	0.751	1.242	0.001	0.044
	1000	0.315	0.748	3.351	0.001	0.166
	9999	0.040	0.752	0.661	0.001	0.016
Crawler Tractors	50	1.128	1.328	2.735	0.002	0.318
	120	0.397	1.228	3.213	0.002	0.270
	175	0.283	1.215	2.937	0.002	0.161
	250	0.202	1.219	2.634	0.002	0.102
	500	0.183	1.225	2.351	0.002	0.091
	750	0.158	1.218	2.094	0.002	0.077
	1000	0.215	1.223	3.200	0.002	0.094

1000	1527		9999	0.153	1.168	2.599	0.002	0.069
0	45	Crushing/Proc	50	1.405	4.681	4.054	0.006	0.349
50	85		120	0.624	3.011	3.936	0.005	0.336
120	171		175	0.439	2.534	3.393	0.005	0.186
175	250		250	0.299	0.937	2.970	0.005	0.092
250	382		500	0.280	0.924	2.580	0.004	0.086
500	602		750	0.280	0.917	2.668	0.004	0.087
750	1337		9999	0.329	1.048	3.915	0.004	0.109
0	16	Dumpers/Tend	25	0.265	0.893	1.673	0.003	0.071
0	36	Excavators	50	0.333	1.083	1.878	0.002	0.143
50	82		120	0.203	0.962	1.917	0.002	0.143
120	146		175	0.153	0.973	1.711	0.002	0.084
175	218		250	0.115	0.974	1.597	0.002	0.051
250	329		500	0.093	0.969	1.227	0.002	0.040
500	578		750	0.097	0.963	1.326	0.002	0.043
750	843		1000	0.125	0.969	2.116	0.002	0.057
1000	1569		9999	0.084	0.963	1.380	0.002	0.036
0	42	Forklifts	50	0.436	0.638	1.192	0.001	0.129
50	82		120	0.162	0.572	1.327	0.001	0.111
120	141		175	0.119	0.573	1.233	0.001	0.067
175	208		250	0.119	0.574	1.346	0.001	0.060
250	344		500	0.095	0.575	1.072	0.001	0.048
500	880		1000	0.327	0.573	3.140	0.001	0.175
0	11	Generator Set	15	0.551	2.703	3.794	0.007	0.207
15	19		25	0.585	1.966	3.615	0.005	0.190
25	33		50	0.943	3.351	3.592	0.005	0.261
50	84		120	0.480	2.588	3.524	0.005	0.256
120	153		175	0.325	2.174	3.056	0.005	0.141
175	229		250	0.212	0.815	2.686	0.005	0.074
250	363		500	0.190	0.821	2.385	0.004	0.070
500	586		750	0.197	0.821	2.472	0.004	0.071
750	1130		9999	0.259	0.933	3.568	0.004	0.092
0	39	Graders	50	1.334	1.157	2.685	0.002	0.357
50	91		120	0.530	1.105	3.980	0.002	0.332
120	148		175	0.361	1.133	3.530	0.002	0.198
175	204		250	0.169	1.122	2.341	0.002	0.076
250	293		500	0.139	1.111	1.521	0.002	0.059
500	796		1000	0.303	1.109	3.798	0.002	0.132
1000	1993		9999	0.190	1.107	2.687	0.002	0.081
0	38	Off-Highway T	50	0.710	1.300	2.408	0.002	0.233
50	75		120	0.307	1.181	2.642	0.002	0.215
120	158		175	0.183	1.174	2.057	0.002	0.104
175	214		250	0.183	1.167	2.407	0.002	0.087
250	334		500	0.125	1.170	1.635	0.002	0.058
500	574		750	0.120	1.171	1.687	0.002	0.055
750	1000		1000	0.044	1.172	1.002	0.002	0.024
1000	1726		9999	0.184	1.198	2.547	0.002	0.082
0	29	Off-Highway T	50	0.666	0.652	2.230	0.002	0.232
50	87		120	0.272	0.596	2.166	0.002	0.176
120	159		175	0.203	0.602	1.949	0.002	0.109
175	211		250	0.189	0.600	2.002	0.002	0.087
250	372		500	0.154	0.610	1.729	0.002	0.066

500	656		750	0.181	0.609	1.957	0.002	0.080
750	897		1000	0.164	0.604	2.398	0.002	0.070
1000	1764		9999	0.167	0.608	2.201	0.002	0.069
0	38	Other Constru	50	0.569	1.338	2.311	0.002	0.209
50	82		120	0.314	1.191	2.715	0.002	0.213
120	152		175	0.242	1.189	2.588	0.002	0.136
175	217		250	0.175	1.203	2.359	0.002	0.087
250	357		500	0.141	1.203	1.834	0.002	0.068
500	598		750	0.108	1.197	1.593	0.002	0.051
750	830		1000	0.099	1.192	1.852	0.002	0.049
1000	1127		9999	0.126	1.168	2.057	0.002	0.057
0	35	Other General	50	0.535	0.972	1.888	0.002	0.182
50	73		120	0.272	0.869	2.222	0.002	0.189
120	149		175	0.177	0.872	1.844	0.002	0.100
175	209		250	0.162	0.875	1.928	0.002	0.078
250	355		500	0.126	0.874	1.512	0.002	0.057
500	592		750	0.090	0.875	1.150	0.002	0.037
750	885		1000	0.127	0.872	2.203	0.002	0.059
1000	2000		9999	0.082	0.872	1.505	0.002	0.040
0	36	Other Material	50	0.717	1.196	2.293	0.002	0.232
50	93		120	0.218	1.081	1.970	0.002	0.151
120	145		175	0.217	1.078	2.231	0.002	0.121
175	218		250	0.175	1.076	2.187	0.002	0.082
250	331		500	0.138	1.074	1.689	0.002	0.065
500	565		750	0.101	1.078	1.377	0.002	0.048
750	923		1000	0.021	1.078	0.892	0.002	0.007
1000	1050		9999	0.061	1.078	1.367	0.002	0.027
0	39	Pavers	50	0.806	1.429	2.342	0.002	0.241
50	80		120	0.296	1.275	2.551	0.002	0.199
120	158		175	0.213	1.280	2.300	0.002	0.115
175	213		250	0.093	1.285	1.728	0.002	0.044
250	327		500	0.077	1.267	1.212	0.002	0.040
500	750		750	0.076	1.280	1.015	0.002	0.044
0	35	Paving Equipn	50	0.364	1.293	1.785	0.002	0.144
50	89		120	0.246	1.177	2.182	0.002	0.167
120	148		175	0.153	1.170	1.763	0.002	0.086
175	216		250	0.117	1.174	1.694	0.002	0.056
250	339		500	0.119	1.166	1.647	0.002	0.059
500	605		750	0.084	1.174	1.407	0.002	0.033
750	842		1000	0.083	1.175	1.633	0.002	0.040
0	8	Plate Compac	15	0.284	1.492	1.781	0.004	0.069
0	13	Pressure Was	15	0.223	1.096	1.538	0.003	0.084
15	19		25	0.237	0.797	1.465	0.002	0.077
25	38		50	0.291	1.148	1.405	0.002	0.090
50	64		120	0.170	1.001	1.364	0.002	0.089
0	8	Pumps	15	0.619	2.703	3.834	0.007	0.229
15	21		25	0.658	1.966	3.615	0.005	0.199
25	37		50	1.018	3.525	3.635	0.005	0.274
50	84		120	0.501	2.629	3.578	0.005	0.269
120	151		175	0.340	2.207	3.103	0.005	0.148
175	217		250	0.223	0.828	2.729	0.005	0.077
250	372		500	0.201	0.836	2.414	0.004	0.072

500	615		750	0.208	0.836	2.503	0.004	0.074
750	1460		9999	0.267	0.950	3.609	0.004	0.094
0	36	Rollers	50	0.515	1.181	2.013	0.002	0.181
50	87		120	0.268	1.064	2.353	0.002	0.175
120	144		175	0.143	1.059	1.737	0.002	0.081
175	213		250	0.136	1.062	1.850	0.002	0.064
250	335		500	0.146	1.072	1.888	0.002	0.073
500	521		750	0.179	1.061	1.875	0.002	0.090
0	47	Rough Terrain	50	0.500	1.273	2.086	0.002	0.173
50	96		120	0.142	1.145	1.721	0.002	0.099
120	130		175	0.091	1.142	1.375	0.002	0.053
175	208		250	0.059	1.145	0.990	0.002	0.023
250	374		500	0.073	1.132	1.415	0.002	0.031
500	625		750	0.035	1.143	0.527	0.002	0.004
0	42	Rubber Tired L	50	1.231	1.059	2.637	0.002	0.349
50	82		120	0.504	0.980	3.742	0.002	0.335
120	150		175	0.399	0.970	3.891	0.002	0.223
175	211		250	0.301	0.973	3.156	0.002	0.156
250	354		500	0.293	0.982	3.161	0.002	0.147
500	584		750	0.214	0.969	2.829	0.002	0.102
0	42	Rubber Tired L	50	0.798	0.987	2.211	0.002	0.244
50	86		120	0.324	0.878	2.537	0.002	0.219
120	150		175	0.225	0.888	2.206	0.002	0.123
175	206		250	0.154	0.885	1.943	0.002	0.066
250	320		500	0.157	0.881	1.816	0.002	0.069
500	600		750	0.149	0.862	1.648	0.002	0.065
750	837		1000	0.159	0.887	2.429	0.002	0.071
1000	1521		9999	0.161	0.884	2.316	0.002	0.068
0	36	Scrapers	50	1.632	1.260	3.253	0.003	0.437
50	84		120	0.369	1.168	3.427	0.002	0.258
120	166		175	0.360	1.155	3.746	0.002	0.200
175	225		250	0.368	1.130	4.179	0.002	0.191
250	381		500	0.238	1.139	2.936	0.002	0.119
500	565		750	0.182	1.140	2.334	0.002	0.088
750	950		1000	0.593	1.138	6.460	0.002	0.301
1000	1923		9999	0.263	1.163	3.562	0.002	0.135
0	6	Signal Boards	15	0.542	2.845	3.397	0.007	0.133
15	37		50	1.143	3.956	3.857	0.006	0.299
50	82		120	0.538	2.828	3.741	0.005	0.291
120	158		175	0.371	2.381	3.232	0.005	0.161
175	216		250	0.297	1.069	3.411	0.006	0.099
0	43	Skid Steer Loa	50	0.247	1.378	1.635	0.002	0.099
50	71		120	0.113	1.234	1.404	0.002	0.081
120	153		175	0.118	1.224	1.500	0.002	0.068
175	201		250	0.101	1.214	1.376	0.002	0.050
250	277		500	0.089	1.201	1.133	0.002	0.040
500	530		750	0.057	1.233	0.887	0.002	0.037
750	1000		1000	0.089	1.233	1.441	0.002	0.045
0	36	Surfacing Equ	50	0.324	0.845	1.584	0.002	0.121
50	89		120	0.173	0.747	1.620	0.002	0.114
120	151		175	0.151	0.748	1.729	0.002	0.083
175	216		250	0.098	0.756	1.541	0.002	0.045

250	362		500	0.076	0.745	1.176	0.001	0.038
500	615		750	0.056	0.749	0.991	0.002	0.031
750	814		1000	0.095	0.752	1.735	0.002	0.043
1000	1141		9999	0.053	0.737	1.158	0.001	0.026
0	36	Sweepers/Scr	50	0.862	1.544	2.630	0.003	0.278
50	78		120	0.397	1.393	3.137	0.002	0.278
120	159		175	0.400	1.390	3.962	0.002	0.218
175	204		250	0.245	1.381	3.073	0.002	0.122
250	303		500	0.222	1.387	2.755	0.002	0.120
500	848		1000	0.082	1.387	1.852	0.002	0.048
0	38	Tractors/Load	50	0.504	0.986	1.960	0.002	0.176
50	83		120	0.220	0.913	1.998	0.002	0.156
120	144		175	0.163	0.898	1.782	0.002	0.090
175	204		250	0.126	0.899	1.763	0.002	0.057
250	320		500	0.120	0.903	1.602	0.002	0.055
500	575		750	0.119	0.893	1.542	0.002	0.056
750	871		1000	0.068	0.912	1.407	0.002	0.032
1000	2006		9999	0.127	0.904	1.969	0.002	0.061
0	40	Trenchers	50	0.662	1.634	2.716	0.003	0.248
50	82		120	0.430	1.474	3.607	0.003	0.282
120	144		175	0.367	1.449	3.856	0.002	0.199
175	218		250	0.264	1.465	3.271	0.003	0.131
250	359		500	0.164	1.453	2.203	0.002	0.082
500	619		750	0.060	1.471	0.816	0.003	0.027
750	860		1000	0.597	1.462	6.603	0.003	0.300
0	11	Welders	15	0.377	1.643	2.331	0.004	0.139
15	20		25	0.400	1.196	2.198	0.003	0.121
25	46		50	0.767	2.497	2.299	0.003	0.193
50	70		120	0.347	1.682	2.281	0.003	0.188
120	174		175	0.239	1.410	1.979	0.003	0.104
175	211		250	0.158	0.529	1.744	0.003	0.052
250	297		500	0.145	0.527	1.525	0.003	0.049
0	29	Water Trucks	50	0.666	0.652	2.230	0.002	0.232
50	87		120	0.272	0.596	2.166	0.002	0.176
120	159		175	0.203	0.602	1.949	0.002	0.109
175	211		250	0.189	0.600	2.002	0.002	0.087
250	372		500	0.154	0.610	1.729	0.002	0.066
500	656		750	0.181	0.609	1.957	0.002	0.080
750	897		1000	0.164	0.604	2.398	0.002	0.070
1000	1764		9999	0.167	0.608	2.201	0.002	0.069













g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
CO2	ROG	CO	NOX	SOX	PM	CO2
179.282	3.69	39.91	55.89	0.08	1.93	8,267
161.199	4.55	57.61	71.03	0.11	3.26	11,932
161.168	7.58	101.52	109.01	0.20	4.66	21,028
161.179	74.34	163.42	765.74	0.32	39.78	33,848
161.179	29.34	295.70	541.17	0.58	11.98	61,248
272.784	4.82	21.04	29.84	0.05	1.78	3,273
272.784	10.24	30.61	56.27	0.08	3.10	6,547
272.784	33.03	105.83	92.71	0.13	8.15	10,093
272.784	30.70	143.77	194.06	0.25	16.68	21,277
272.784	40.19	227.09	317.11	0.45	17.29	40,099
272.784	39.83	126.02	414.72	0.67	12.72	59,467
272.784	65.39	220.58	636.74	1.03	20.91	105,022
272.784	102.14	340.90	1,022.29	1.63	33.08	162,306
272.784	158.40	527.57	2,000.05	2.22	55.35	220,409
300.704	17.49	47.45	104.66	0.11	7.48	11,810
255.370	13.77	84.47	166.63	0.20	9.90	21,025
265.780	23.60	158.60	291.41	0.38	13.11	39,478
260.280	23.30	217.24	347.07	0.52	10.39	54,074
256.887	36.59	360.37	526.93	0.86	16.82	89,700
267.458	52.07	657.55	730.52	1.56	24.83	163,674
262.720	52.81	969.97	1,382.56	2.31	27.03	241,440
262.792	249.58	2,815.34	5,713.21	6.69	140.08	700,778
318.248	3.35	17.49	21.01	0.04	0.86	2,864
318.248	11.36	35.43	65.98	0.10	3.36	7,956
414.859	9.01	30.75	56.93	0.09	2.14	7,467
414.859	35.52	124.53	120.25	0.18	9.33	13,690
414.859	40.53	215.73	283.49	0.39	22.10	33,604
414.859	60.89	393.15	526.23	0.82	26.56	72,600
165.349	25.56	33.55	71.11	0.06	7.03	6,718
149.914	32.55	66.59	257.80	0.13	19.13	13,334
151.512	34.87	111.89	354.71	0.21	19.18	22,406
150.978	42.02	163.60	476.48	0.31	21.75	32,762
150.610	48.14	252.78	593.01	0.48	24.53	50,621
150.355	48.90	425.86	704.59	0.81	24.81	85,280
149.777	295.22	701.27	3,142.09	1.34	155.81	140,431
150.667	40.73	774.95	680.96	1.48	16.45	155,187
245.076	47.94	56.45	116.25	0.10	13.50	10,418
226.639	34.48	106.66	279.10	0.19	23.46	19,685
224.211	42.39	181.68	439.21	0.32	24.10	33,529
224.909	41.06	247.20	534.33	0.44	20.60	45,622
225.994	62.39	417.20	801.04	0.74	31.03	76,994
224.752	89.87	694.30	1,193.73	1.22	43.72	128,134
225.756	178.04	1,013.06	2,650.35	1.79	78.12	186,964

215.490	234.20	1,782.39	3,966.82	3.14	104.99	328,945
443.274	63.23	210.66	182.43	0.26	15.70	19,947
443.274	53.01	255.97	334.55	0.44	28.59	37,678
443.274	75.15	433.25	580.27	0.85	31.80	75,800
443.274	74.67	234.33	742.50	1.25	22.97	110,818
443.274	106.92	352.98	985.48	1.66	32.74	169,331
443.274	168.45	552.32	1,606.15	2.68	52.20	266,851
443.274	440.49	1,401.65	5,233.84	5.96	146.02	592,657
215.954	4.23	14.29	26.77	0.04	1.14	3,455
222.420	11.90	38.70	67.12	0.08	5.11	7,949
197.683	16.57	78.70	156.75	0.15	11.66	16,166
199.837	22.40	142.08	249.90	0.28	12.33	29,184
199.981	25.21	212.71	348.94	0.42	11.10	43,690
199.126	30.48	318.60	403.38	0.62	13.08	65,441
197.882	55.92	556.78	766.52	1.09	24.93	114,364
199.131	105.53	817.15	1,783.73	1.60	47.73	167,843
197.811	132.46	1,511.16	2,165.83	2.96	56.38	310,393
117.014	18.49	27.04	50.56	0.05	5.48	4,963
105.000	13.32	47.13	109.28	0.08	9.18	8,649
105.128	16.81	80.94	174.22	0.14	9.51	14,853
105.400	24.73	119.55	280.18	0.21	12.46	21,939
105.464	32.80	197.53	368.39	0.35	16.36	36,250
105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
420.542	6.06	29.73	41.74	0.07	2.28	4,626
420.542	11.12	37.35	68.68	0.10	3.60	7,990
420.542	31.12	110.58	118.54	0.18	8.61	13,878
420.542	40.36	217.43	296.03	0.41	21.54	35,326
420.542	49.68	332.64	467.52	0.72	21.58	64,343
420.542	48.48	186.55	615.05	1.08	16.97	96,304
420.542	69.11	298.11	865.60	1.50	25.23	152,657
420.542	115.56	481.24	1,448.52	2.48	41.60	246,438
420.542	292.90	1,054.30	4,031.52	4.78	103.63	475,212
223.053	52.24	45.33	105.15	0.08	13.98	8,735
212.987	48.23	100.57	362.15	0.19	30.24	19,381
218.262	53.41	167.56	522.27	0.31	29.37	32,291
216.134	34.62	229.19	478.36	0.42	15.50	44,168
214.032	40.89	325.60	445.87	0.60	17.28	62,748
213.737	241.58	882.83	3,023.02	1.62	105.21	170,135
213.348	378.82	2,206.16	5,355.26	4.06	162.28	425,161
252.805	26.72	48.98	90.67	0.09	8.76	9,521
229.502	22.91	87.99	196.93	0.16	16.04	17,105
228.294	28.94	185.64	325.19	0.34	16.47	36,088
226.772	39.03	249.46	514.79	0.46	18.52	48,493
227.483	41.82	391.36	546.72	0.73	19.24	76,078
227.614	68.56	671.55	967.72	1.25	31.52	130,545
227.753	43.78	1,171.61	1,001.58	2.17	24.30	227,753
232.958	317.89	2,068.71	4,396.35	3.84	140.98	402,143
215.238	19.41	18.99	64.98	0.06	6.76	6,272
196.896	23.72	51.90	188.57	0.16	15.31	17,142
198.671	32.27	95.57	309.74	0.30	17.26	31,567
198.322	39.93	126.70	422.46	0.40	18.27	41,849
201.459	57.23	227.16	643.99	0.72	24.60	75,027

200.991	118.42	399.15	1,283.60	1.26	52.22	131,834
199.622	147.41	542.27	2,151.90	1.71	63.25	179,107
200.841	294.22	1,072.76	3,882.43	3.38	121.17	354,321
243.421	21.63	50.86	87.84	0.09	7.95	9,252
216.722	25.63	97.18	221.46	0.17	17.34	17,676
216.355	36.94	181.37	394.67	0.32	20.68	32,992
218.814	37.98	260.92	511.68	0.45	18.79	47,462
218.857	50.32	429.37	654.51	0.75	24.11	78,102
217.679	64.60	715.23	952.29	1.24	30.57	130,101
216.873	81.91	989.77	1,537.09	1.72	40.69	180,038
212.371	142.39	1,315.40	2,317.12	2.28	64.07	239,271
199.186	18.77	34.13	66.26	0.07	6.39	6,992
177.921	19.91	63.57	162.60	0.12	13.83	13,022
178.621	26.40	130.06	275.08	0.25	14.98	26,642
179.141	33.81	182.83	403.11	0.36	16.40	37,451
179.029	44.79	310.02	536.31	0.61	20.25	63,504
179.232	53.12	517.60	680.19	1.01	22.06	106,023
178.698	112.47	772.06	1,949.89	1.51	51.82	158,148
178.698	164.92	1,744.77	3,010.07	3.41	79.54	357,397
229.351	25.64	42.74	81.95	0.08	8.29	8,198
207.401	20.34	100.73	183.51	0.18	14.09	19,322
206.802	31.41	155.86	322.57	0.29	17.49	29,897
206.479	38.24	234.96	477.37	0.43	17.87	45,071
205.960	45.66	355.79	559.64	0.65	21.68	68,248
206.729	56.88	608.45	777.44	1.11	26.84	116,716
206.729	19.39	994.72	823.65	1.82	6.44	190,811
206.729	64.32	1,131.59	1,435.10	2.07	28.31	217,066
242.599	31.11	55.20	90.45	0.09	9.29	9,370
216.385	23.52	101.45	203.01	0.16	15.85	17,221
217.349	33.65	202.48	363.70	0.33	18.22	34,370
218.123	19.86	273.98	368.49	0.44	9.44	46,506
214.992	25.06	414.65	396.75	0.67	13.17	70,384
217.241	56.87	959.87	761.24	1.56	32.96	162,931
204.648	12.69	45.02	62.16	0.07	5.03	7,125
186.351	21.76	104.32	193.32	0.16	14.81	16,511
185.162	22.66	173.63	261.68	0.26	12.77	27,479
185.801	25.25	253.19	365.44	0.38	12.16	40,071
184.483	40.39	394.88	558.10	0.60	20.04	62,495
185.772	50.61	710.16	851.11	1.07	19.80	112,392
185.931	70.08	989.20	1,375.15	1.50	33.61	156,554
244.369	2.28	11.94	14.25	0.03	0.55	1,955
170.490	2.90	14.24	20.00	0.03	1.09	2,216
170.490	4.51	15.14	27.84	0.04	1.46	3,239
170.490	11.07	43.62	53.38	0.08	3.41	6,479
170.490	10.87	64.05	87.28	0.13	5.71	10,911
420.542	4.95	21.62	30.67	0.05	1.83	3,364
420.542	13.81	41.29	75.91	0.11	4.19	8,831
420.542	37.68	130.44	134.50	0.20	10.15	15,560
420.542	42.09	220.81	300.55	0.41	22.58	35,326
420.542	51.38	333.25	468.55	0.71	22.33	63,502
420.542	48.40	179.75	592.29	1.03	16.74	91,258
420.542	74.96	310.94	898.09	1.54	26.83	156,442



420.542	127.77	514.06	1,539.44	2.60	45.32	258,633
420.542	390.55	1,386.97	5,269.73	6.17	136.98	613,991
218.675	18.36	42.12	71.83	0.07	6.44	7,802
197.028	23.31	92.40	204.39	0.16	15.23	17,114
196.218	20.55	152.32	249.79	0.27	11.62	28,212
196.767	29.06	226.54	394.61	0.40	13.67	41,961
198.479	48.77	358.84	632.18	0.63	24.50	66,466
196.512	93.29	552.23	975.81	0.98	46.70	102,285
234.116	23.65	60.20	98.65	0.11	8.20	11,070
210.518	13.69	110.28	165.74	0.19	9.58	20,279
210.012	11.82	148.01	178.19	0.26	6.91	27,216
210.550	12.26	238.52	206.22	0.42	4.87	43,859
208.195	27.38	423.33	529.17	0.74	11.59	77,842
210.233	21.76	714.57	329.62	1.25	2.25	131,396
226.483	51.19	44.06	109.68	0.09	14.50	9,418
209.407	41.13	79.92	305.28	0.16	27.33	17,086
207.401	59.73	145.22	582.48	0.30	33.39	31,044
208.081	63.58	205.35	665.84	0.42	32.85	43,901
209.864	103.66	347.56	1,119.29	0.71	52.22	74,303
207.187	125.23	566.08	1,652.69	1.16	59.73	121,018
210.033	33.28	41.17	92.21	0.08	10.18	8,758
186.853	27.91	75.67	218.54	0.15	18.89	16,097
188.868	33.80	133.18	330.90	0.27	18.49	28,330
188.293	31.62	182.26	399.99	0.37	13.66	38,770
187.353	50.27	281.57	580.57	0.57	21.92	59,895
183.260	89.76	517.32	989.76	1.05	38.91	110,043
188.711	133.01	742.38	2,032.31	1.51	59.55	157,916
187.956	244.97	1,343.95	3,522.49	2.73	102.67	285,882
279.274	58.98	45.54	117.58	0.10	15.79	10,094
258.776	31.12	98.45	289.03	0.21	21.76	21,822
255.949	59.89	191.88	622.40	0.41	33.26	42,530
250.394	82.87	254.15	940.19	0.54	42.89	56,332
252.554	90.92	434.52	1,119.56	0.92	45.22	96,311
252.621	102.58	643.90	1,318.68	1.36	49.55	142,718
252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666
257.796	506.08	2,236.99	6,851.39	4.73	259.18	495,821
466.006	3.25	17.07	20.38	0.04	0.80	2,796
443.274	42.28	146.38	142.71	0.21	11.05	16,401
443.274	44.09	231.91	306.78	0.43	23.84	36,348
443.274	58.59	376.21	510.58	0.79	25.39	70,037
535.623	64.24	231.00	736.68	1.30	21.48	115,695
215.335	10.72	59.89	71.06	0.09	4.28	9,360
192.790	7.99	87.01	99.05	0.13	5.72	13,599
191.337	17.98	187.22	229.36	0.28	10.47	29,260
189.731	20.33	243.44	275.98	0.36	10.09	38,047
187.666	24.66	332.20	313.48	0.50	11.05	51,921
192.714	30.36	653.51	470.21	0.98	19.63	102,138
192.714	89.03	1,233.03	1,440.57	1.84	45.49	192,714
177.833	11.57	30.14	56.51	0.06	4.32	6,343
157.289	15.32	66.27	143.69	0.13	10.11	13,948
157.415	22.74	112.92	260.97	0.23	12.55	23,766
159.114	21.12	163.35	333.01	0.33	9.81	34,379

156.752	27.53	269.88	426.12	0.54	13.82	56,800
157.590	34.48	460.55	609.52	0.93	19.28	96,930
158.243	77.15	612.24	1,412.43	1.23	34.65	128,855
155.194	60.22	841.35	1,321.83	1.69	30.00	177,076
265.154	30.67	54.93	93.58	0.09	9.91	9,436
239.305	30.81	108.00	243.23	0.18	21.56	18,552
238.803	63.79	221.69	631.87	0.36	34.82	38,082
237.291	49.98	282.36	628.12	0.46	24.93	48,504
238.264	67.22	419.57	833.42	0.69	36.20	72,075
238.264	69.89	1,176.17	1,570.74	1.93	40.75	202,048
210.545	19.31	37.77	75.10	0.08	6.73	8,065
194.965	18.15	75.46	165.14	0.15	12.93	16,114
191.692	23.39	129.21	256.50	0.26	12.96	27,591
192.049	25.66	183.67	359.95	0.37	11.69	39,220
192.893	38.52	289.20	512.98	0.59	17.59	61,753
190.737	68.15	513.28	886.12	1.05	32.20	109,601
194.700	59.23	794.55	1,226.21	1.62	27.61	169,661
193.002	255.40	1,812.80	3,949.88	3.70	121.76	387,090
293.765	26.33	65.01	108.05	0.11	9.86	11,685
264.849	35.26	120.92	296.00	0.21	23.16	21,733
260.505	52.74	208.53	554.78	0.36	28.62	37,479
263.326	57.63	320.01	714.50	0.55	28.54	57,516
261.218	58.72	521.06	789.70	0.89	29.30	93,651
264.337	37.02	910.75	505.15	1.56	16.53	163,691
262.792	513.26	1,257.44	5,678.99	2.16	258.04	226,001
255.735	4.14	18.08	25.64	0.04	1.53	2,813
255.735	8.00	23.91	43.96	0.06	2.43	5,115
255.735	35.30	114.87	105.77	0.15	8.89	11,764
255.735	24.27	117.72	159.69	0.21	13.17	17,901
255.735	41.56	245.32	344.38	0.50	18.02	44,498
255.735	33.39	111.59	367.99	0.61	11.02	53,960
255.735	43.17	156.62	452.85	0.75	14.45	75,953
215.238	19.408	18.990	64.985	0.060	6.758	6272.125
196.896	23.721	51.901	188.569	0.164	15.308	17142.259
198.671	32.274	95.572	309.739	0.301	17.256	31566.547
198.322	39.927	126.704	422.459	0.400	18.272	41848.985
201.459	57.231	227.155	643.993	0.716	24.598	75027.015
200.991	118.417	399.146	1283.603	1.259	52.217	131833.730
199.622	147.408	542.271	2151.897	1.710	63.249	179106.645
200.841	294.224	1072.759	3882.428	3.384	121.174	354321.133











**APPENDIX B**  
**BIOLOGICAL RESOURCES**



# MOORE BIOLOGICAL CONSULTANTS

September 11, 2017

Mr. Charlie Simpson  
BaseCamp Environmental  
115 South School Street, Ste.14  
Lodi, CA 95240

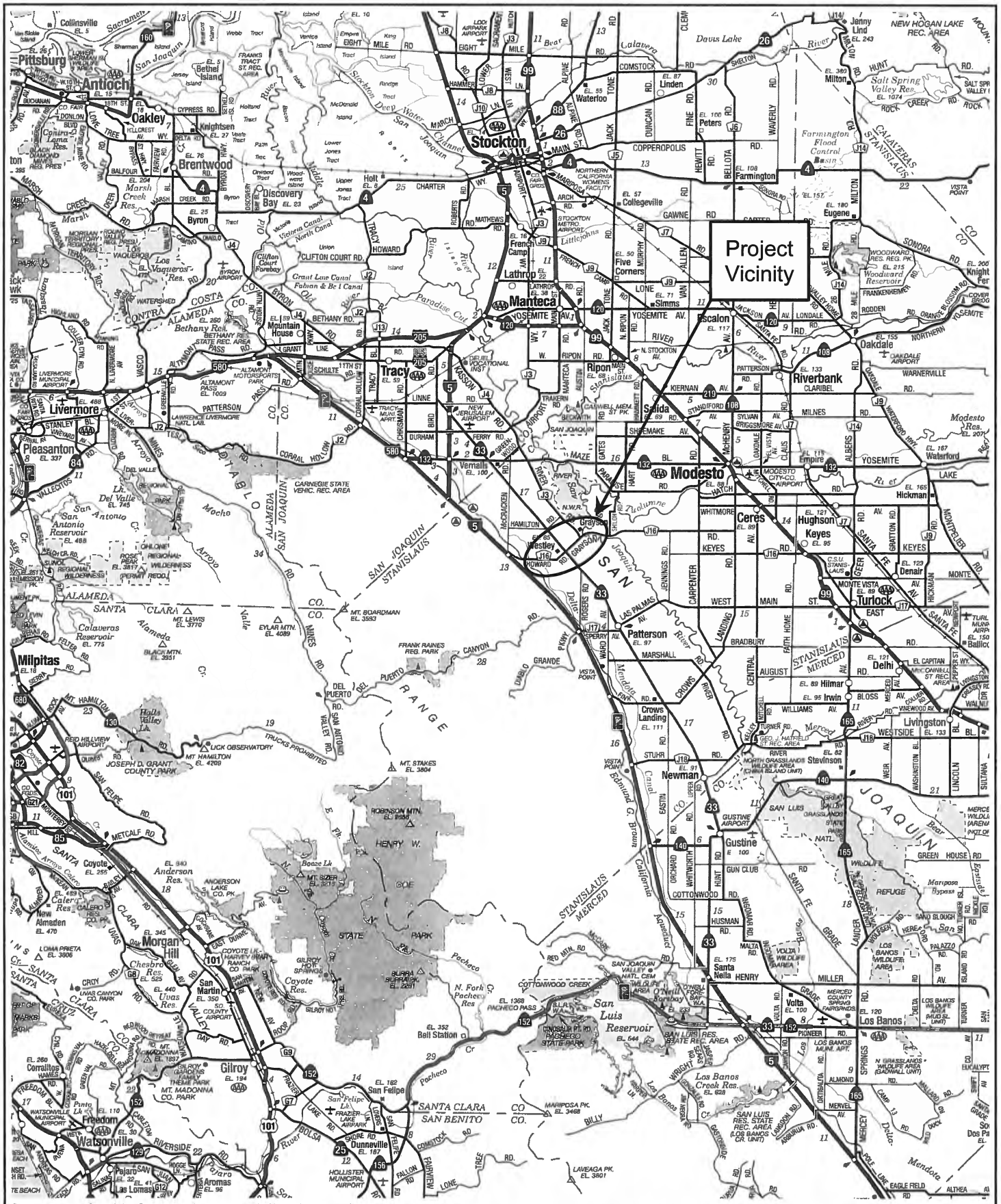
Subject: "WESTLEY-GRAYSON WASTEWATER TREATMENT PROJECT",  
STANISLAUS COUNTY, CALIFORNIA: BIOLOGICAL  
ASSESSMENT

Dear Charlie:

Thank you for asking Moore Biological Consultants to assist with the Westley-Grayson Wastewater Treatment Project in Stanislaus County, California (Figures 1 and 2). The purpose of this assessment is to describe existing biological resources in the project site, identify potentially significant impacts to biological resources from the project, and provide recommendations for how to reduce those impacts to a less-than-significant level. The work involved reviewing databases, aerial photographs, and documents, and conducting a field survey to document vegetation communities, potentially jurisdictional Waters of the U.S. and/or wetlands, and potentially suitable habitat for or presence of special-status species. This report details the methodology and results of our investigation.

## **Project Overview**

The Westley-Grayson Wastewater Treatment Project is within and between the unincorporated areas of Westley and Grayson in western Stanislaus County, California. The objective of the project is to provide a regional wastewater treatment facility that will meet existing and anticipated future needs of the community of Westley and the Westley Farm Labor Housing Complex, and the community of Grayson in compliance with regulatory requirements.

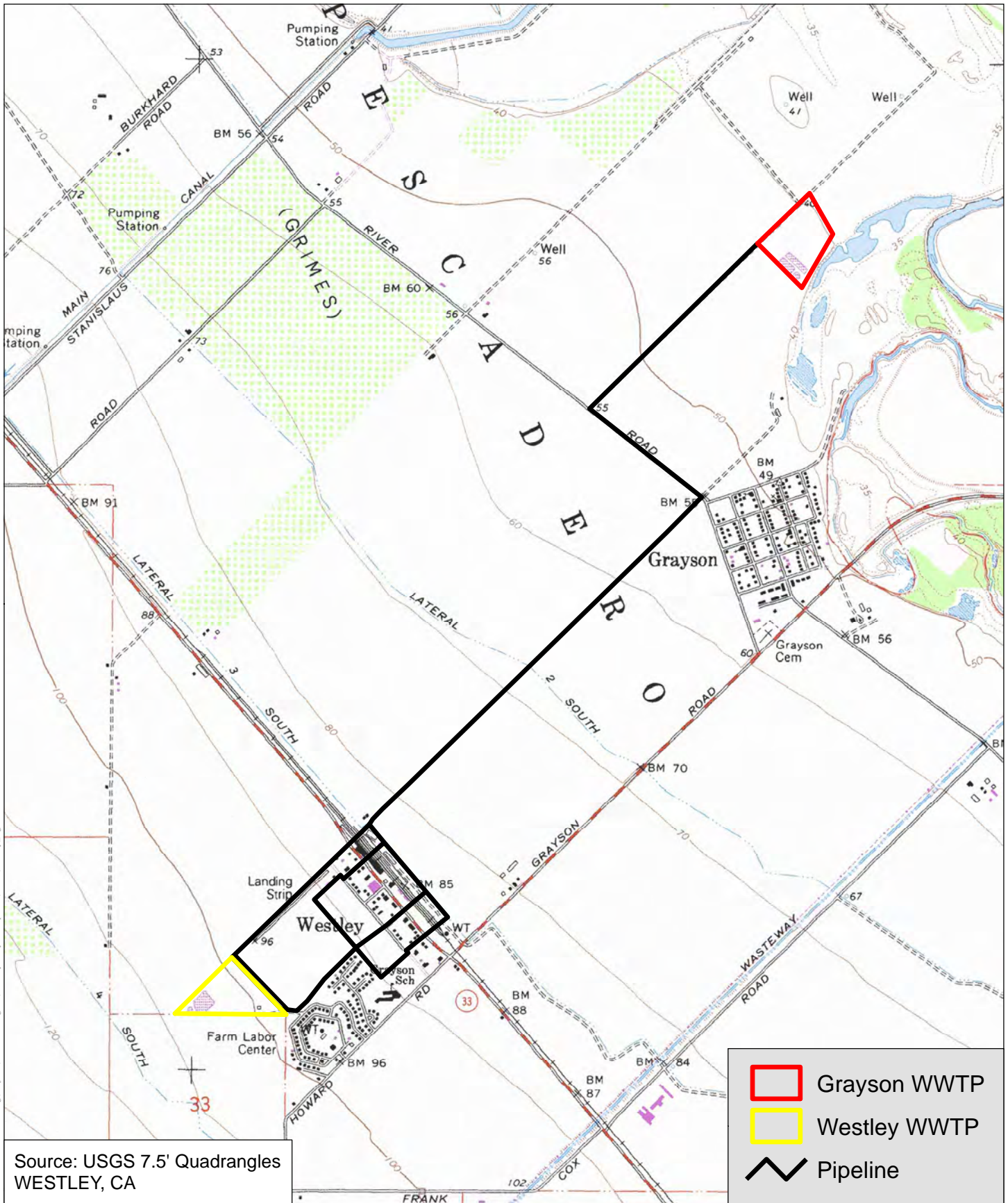


Source: Calif. State Automobile Association

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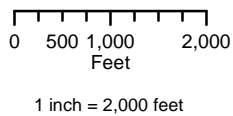
**FIGURE 1  
PROJECT VICINITY**



Source: USGS 7.5' Quadrangles  
WESTLEY, CA

**Figure 2**

Moore Biological  
Consultants



- Grayson WWTTP
- Westley WWTTP
- Pipeline

**USGS**

Westley-Grayson Pipeline

Stanislaus County, CA

The proposed project would divert wastewater generated in Westley from the existing Westley Community Services District (WCSD) Wastewater Treatment Plant (WWTP) to a new wastewater pump station and force main extending approximately 2.5 miles east through the community of Westley to the Grayson Community Services District (GCSD) WWTP. The project will involve project components at the WCSD WWTF and the GCSD WWTP, and a pipeline connecting the facilities. For this assessment, the WCSD WWTP, the GCSD WWTP, and the proposed pipeline alignment (including alternate segments) are cumulatively considered the “Project Site” (Figures 3, 4, and 5).

Improvements required to upgrade the existing GCSD WWTP to accommodate flows from the WCSD service area and will require the following improvements:

- Replacement of existing WCSD influent lift station and force main, including miscellaneous site improvements.
- Addition of new flow meter on influent lift station discharge force main.
- Construction of a headworks facility.
- Sludge removal from the existing GCSD aeration and stabilization ponds.
- Addition of treatment ponds to increase capacity to 140,000 gallons per day.
- Replacement/upgrade of electrical power supply and control facilities.
- Addition of a standby generator at the influent lift station.
- Decommissioning the existing WCSD WWTP.
- Installation of groundwater monitoring wells.

The proposed force-main pipeline will be constructed between the WCSD WWTP to the GCSD WWTP. From the southeast corner of the WCSD WWTP, the pipeline will go northwest along the east edge of the WCSD WWTP and then



Grayson WWTP  
 Westley WWTP  
 Pipeline

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Google

Imagery ©2017, DigitalGlobe, U.S. Geological Survey, USDA Farm Service Agency



**Figure 3**

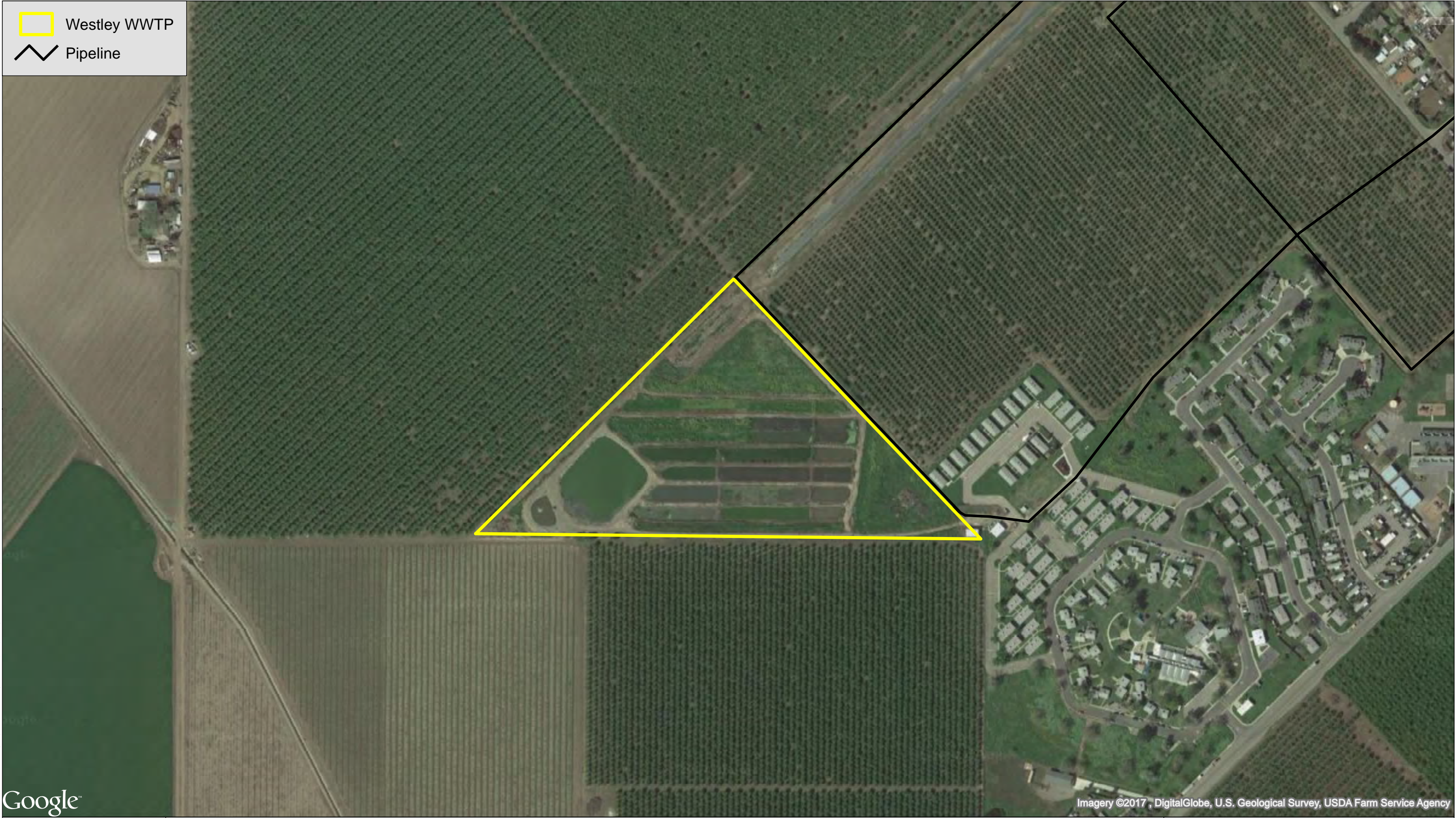
Moore Biological  
Consultants

0      500      1,000      2,000  
 Feet  
 1 inch = 1,000 feet



**Aerial, Overall Project**  
**Westley-Grayson Pipeline**  
 Stanislaus County, CA

 Westley WWTP  
 Pipeline



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Google


Imagery ©2017, DigitalGlobe, U.S. Geological Survey, USDA Farm Service Agency

**Figure 4**

Moore Biological  
Consultants

Map Date: 06/06/2017  
Aerial Photo: Google Earth (03/2016)

0 150 300 600  
Feet  
1 inch = 300 feet





**Aerial, Westley Area**

Westley-Grayson Pipeline

Stanislaus County, CA

**Location**

-  Grayson WWTP
-  Pipeline



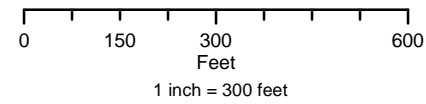
Google

Imagery ©2017, DigitalGlobe, U.S. Geological Survey, USDA Farm Service Agency

**Figure 5**

Moore Biological  
Consultants

Map Date: 06/02/2017  
Aerial Photo: Google Earth (03/2016)



**Aerial, Grayson WWTP**

Westley-Grayson Pipeline

Stanislaus County, CA

northeast and along a farm road north of an airstrip to State Route 33. The pipeline will continue in the same direction (i.e., northeast) under State Route 33 and some railroad tracks, and then through agricultural parcels, along River Road, and then along a public road to the GCSD WWTP.

From the southeast corner of the WCSD WWTP, the alternate alignment would go northeast through the Westley Farm Labor Housing Complex and then through an orchard and the community of Westley along one of three alignments. Each of the three alternate alignments would go northeast under State Route 33 and the railroad tracks and then turn northwest just prior to reaching West Side Irrigation District (WSID) Lateral 3 South. The alternate would then go northwest adjacent to Lateral 3 South where it would follow the proposed alignment to the GCSD WWTP.

The pipeline will cross Lateral 3 South just east of the railroad tracks and Lateral 2 South approximately mid-way between Westley and Grayson. The crossings of State Route 33 and the railroad tracks will be constructed using underground construction techniques such as bore & jack or horizontal directional drilling. The crossings of the WSID laterals are also expected to be constructed using underground construction techniques, but may be open cuts

## **Methods**

Prior to the field survey, we conducted a search of California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDDB, 2017). The CNDDDB search was conducted on the USGS 7.5-minute Westley topographic quadrangle, encompassing approximately 60+/- square miles surrounding the site (Attachment A). The United States Fish and Wildlife Service (USFWS) IPaC Trust Resource Report of Federally Threatened and Endangered species that may occur in or be affected by projects in the project vicinity was also reviewed (Attachment A). This information was used to identify special-status wildlife and plant species that have been previously documented in the



vicinity or have the potential to occur based on suitable habitat and geographical distribution. Additionally, the CNDDDB depicts the locations of sensitive habitats. The USFWS on-line-maps of designated critical habitat in the area were also downloaded.

A field survey was conducted on May 30, 2017. The survey area included all areas of project improvements, as well as adjacent areas that may be subject to construction disturbance. The survey consisted of driving and walking throughout the site making observations of habitat conditions and noting surrounding land uses, habitat types, and plant and wildlife species. The fieldwork included an assessment of potentially jurisdictional Waters of the U.S. and wetlands as defined by the U.S. Army Corps of Engineers (ACOE, 1987; 2008) and a search for special-status species and suitable habitat for special-status species (e.g., blue elderberry shrubs, vernal pools). Trees in and near the site were assessed for the potential use by nesting raptors, especially Swainson's hawk (*Buteo swainsoni*). The cropland and grasslands in the site and adjacent areas visible from the site were searched for burrowing owls (*Athene cunicularia*) or ground squirrel burrows with evidence of past occupancy.

## Results

GENERAL SETTING: The project site extends northeast to southwest between the communities of Grayson and Westley, in Stanislaus County, California (Figure 1). The project site is within an area of unnumbered Sections within Township 4 South, Range 7 East of the USGS 7.5-minute Westley topographic quadrangle (Figure 2). The site slopes very gently to the east and is at elevations of approximately 40 to 110 feet above mean sea level.

Surrounding land uses in this part of Stanislaus County are primarily agricultural with scattered residences and rural communities. The project site is in an area that primarily consists of leveled fields intensively farmed in orchard crops and

annual crops (Figure 3). The project site also includes the two developed WWTPs and residential, commercial, and industrial neighborhoods in the vicinity of Westley.

VEGETATION: The majority of the existing GCSD WWTP and WCSD WWTP where new project facilities will be constructed support highly disturbed ruderal grassland vegetation. There are also narrow strips of highly disturbed ruderal grassland vegetation along the edges of River Road, and the agricultural fields, dirt roads, irrigation and/or drainage ditches, and canals in the area (See photographs in Attachment B). Vegetation in these areas is consists almost entirely of non-native grasses and weeds. Oats (*Avena* sp.), soft chess brome (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), foxtail barley (*Hordeum murinum*), and perennial ryegrass (*Lolium perenne*) are some of the most common grasses in the ruderal grassland vegetation. Other grassland species such as yellow star-thistle (*Centaurea solstitialis*), black mustard (*Brassica nigra*), prickly lettuce (*Lactuca serriola*), common groundsel (*Senecio vulgaris*), bull thistle (*Cirsium vulgare*), rancher's fireweed (*Amsinckia menziesii*), common sunflower (*Helianthus annuus*), common mallow (*Malva neglecta*), and filaree (*Erodium* spp.) are intermixed with the grasses. Table 1 is a list of plant species observed in the site.

The wastewater disposal areas in each WWTP are vegetated with upland species, wetland species, or a mixture of both, depending on how recently water has been delivered to the areas (See photographs in Attachment B). If not used for a period of time, the shallow ponds support ruderal upland grassland vegetation. Under wetter conditions, the ponds support hydrophytic (i.e., wetland) vegetation such rabbit's foot grass (*Polypogon monspeliensis*), perennial ryegrass, Johnson grass (*Sorghum halepense*), Mediterranean barley (*Hordeum marinum*), and umbrella sedge (*Cyperus eragrostis*). A subset of these same hydrophytic species occur in the dirt-lined irrigation and/or drainage laterals and/or ditches in the site.

TABLE 1  
PLANT SPECIES OBSERVED IN THE SITE

---

<i>Amsinckia menziesii</i>	rancher's fireweed
<i>Avena fatua</i>	wild oat
<i>Brassica nigra</i>	black mustard
<i>Bromus diandrus</i>	ripgut brome
<i>Bromus hordeaceus</i>	soft chess brome
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Centaurea solstitialis</i>	yellow star-thistle
<i>Convolvulus arvensis</i>	morning glory
<i>Cirsium vulgare</i>	bull thistle
<i>Cyperus eragrostis</i>	umbrella sedge
<i>Erodium botrys</i>	filaree
<i>Helianthus annuus</i>	common sunflower
<i>Helminthotheca echioides</i>	bristly ox-tongue
<i>Hordeum marinum</i>	Mediterranean barley
<i>Hordeum murinum</i>	foxtail barley
<i>Lactuca serriola</i>	prickly lettuce
<i>Leontodon saxatilis</i>	long-beaked hawkbit
<i>Lolium perenne</i>	perennial ryegrass
<i>Malva neglecta</i>	common mallow
<i>Polypogon monspeliensis</i>	annual rabbit's-foot grass
<i>Portulaca oleracea</i>	little-hogweed
<i>Raphanus sativus</i>	wild radish
<i>Rumex crispus</i>	curly dock
<i>Salix spp.</i>	willow
<i>Senecio vulgaris</i>	common groundsel
<i>Sorghum halepense</i>	Johnson grass
<i>Silybum marianum</i>	milk thistle
<i>Tribulus terrestris</i>	puncture vine

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Trees in and near the project site include orchard trees, riparian trees, and a variety of ornamentals (see photographs in Attachment B). There are California fan palm (*Washingtonia filifera*), blue gum (*Eucalyptus* sp.), ornamental pine (*Pinus* sp.), black walnut (*Juglans californicus*), and other ornamental trees in the vicinity of Westley. Dominant trees in the San Joaquin River riparian habitats adjacent to the GCSD WWTP include valley oak (*Quercus lobata*), Fremont cottonwood (*Populus fremontii*), black walnut, white alder (*Alnus rhombifolia*), and willows (*Salix* spp.). No blue elderberry (*Sambucus mexicana*) shrubs were observed within the project site. There are some planted elderberry shrubs in a conservation area just north of the GCSD WWTP.

WILDLIFE: A variety of bird species were observed in the site. Mallard (*Anas platyrhynchos*), great egret (*Casmerodius albus*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), acorn woodpecker (*Melanerpes formicivorus*), American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferous*), northern mockingbird (*Mimus polyglottos*), Brewer's blackbird (*Euphagus cyanocephalus*), and red-winged blackbird (*Agelaius phoeniceus*) are representative bird species observed in and near the site (Table 2). All of these are species commonly found in agricultural areas in the greater project vicinity.

The project area is primarily orchards and open fields and there are limited potential nest trees within or near the project site that are suitable for nesting raptors, including Swainson's hawks. During the survey, a Swainson's hawk was observed perched on a telephone pole in the middle of the GCSD WWTP disposal area. A few red-tailed hawks were also observed. Given the presence of trees and shrubs in and near the site, it is likely one or more pairs of raptors and a variety of songbirds nest in and/or near the site during most years. It is also likely that ground-nesting songbirds such as killdeer and red-winged blackbird nest in the grassland habitats in the site.

TABLE 2  
WILDLIFE SPECIES OBSERVED IN THE SITE

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**Birds**

Great egret	<i>Casmerodius albus</i>
Mallard	<i>Anas platyrhynchos</i>
Turkey vulture	<i>Cathartes aura</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
California quail	<i>Callipepla californica</i>
American coot	<i>Fulica americana</i>
Killdeer	<i>Charadrius vociferus</i>
Rock dove	<i>Columba livia</i>
Mourning dove	<i>Zenaida macroura</i>
Acorn woodpecker	<i>Melanerpes formicivorus</i>
Northern flicker	<i>Colaptes auratus</i>
Black Phoebe	<i>Sayornis nigricans</i>
Western kingbird	<i>Tyrannus verticalis</i>
Western scrub jay	<i>Aphelocoma coerulescens</i>
American crow	<i>Corvus brachyrhynchos</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Yellow-rumped warbler	<i>Setophaga auduboni auduboni</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Western meadowlark	<i>Sturnella neglecta</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>

**Mammals**

Desert cottontail	<i>Sylvilagus audubonii</i>
Black-tailed hare	<i>Lepus californicus</i>
California ground squirrel	<i>Spermophilus beecheyi</i>
Pocket gopher	<i>Thomomys bottae</i>

**Reptiles and Amphibians**

Western fence lizard	<i>Sceloporus occidentalis</i>
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A variety of mammals are likely to occur in the project site. During the survey, California ground squirrel (*Spermophilus beecheyi*), black-tailed hare (*Lepus californicus*), pocket gopher (*Thomomys bottae*) and desert cottontail were the observed in the site. Coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), and Virginia opossum (*Didelphis virginiana*) are expected to occur at the project site. Along with the California ground squirrels found on the site, there were ground squirrel burrows scattered throughout the site. A number of species of small rodents including mice (*Mus musculus*, *Reithrodontomys megalotis*, and *Peromyscus maniculatus*) and voles (*Microtus californicus*) are likely to occur.

Based on habitat types present, only a few amphibian and reptile species are expected to use habitats in the site. Western fence lizard (*Sceloporus occidentalis*) was the only amphibian observed; no reptiles were observed. Common species such as Pacific chorus frog (*Pseudacris regilla*), gopher snake (*Pituophis melanoleucus*), common king snake (*Lampropeltis getulus*), and common garter snake (*Thamnophis sirtalis*) are expected to occur at the site.

WATERS OF THE U.S. AND WETLANDS: Waters of the U.S., including wetlands, are broadly defined under 33 Code of Federal Regulations (CFR) 328 to include navigable waterways, their tributaries, and adjacent wetlands. State and federal agencies regulate these habitats and Section 404 of the Clean Water Act requires that a permit be secured prior to the discharge of dredged or fill materials into any waters of the U.S., including wetlands. ACOE, CDFW, and the California Regional Water Quality Control Board (RWQCB) have jurisdiction over modifications to riverbanks, lakes, stream channels and other wetland features.

“Waters of the U.S.”, as defined in 33 CFR 328.4, encompasses Territorial Seas, Tidal Waters, and Non-Tidal Waters; Non-Tidal Waters includes interstate and intrastate rivers and streams, as well as their tributaries. The limit of federal jurisdiction of Non-Tidal Waters of the U.S. extends to the “ordinary high water mark”. The ordinary high water mark is established by physical characteristics

such as a natural water line impressed on the bank, presence of shelves, destruction of terrestrial vegetation, or the presence of litter and debris.

Jurisdictional wetlands are vegetated areas that meet specific vegetation, soil, and hydrologic criteria defined by the ACOE *Wetlands Delineation Manual* and Regional Supplement (ACOE, 1987; 2008). Jurisdictional wetlands are usually adjacent to or hydrologically associated with Waters of the U.S. Isolated wetlands are outside federal jurisdiction, but may still be regulated by state agencies including CDFW and RWQCB.

Jurisdictional wetlands and Waters of the U.S. include, but are not limited to, perennial and intermittent creeks and drainages, lakes, seeps, and springs; emergent marshes; riparian wetlands; and seasonal wetlands. Wetlands and Waters of the U.S. provide critical habitat components, such as nest sites and a reliable source of water, for a wide variety of wildlife species.

No potentially jurisdictional Waters of the U.S. or wetlands were observed within the footprint of the proposed project. The pipeline alignment along paved roads and/or farm roads will be constructed in roads, road shoulders, orchards, and/or in disturbed upland ruderal grassland vegetation. WSID irrigation Lateral 2 South and Lateral 3 South convey water that is lifted up and out of the San Joaquin River and are not under ACOE jurisdiction. The wastewater disposal areas in the GCSD WWTP and WCSD WWTP where project facilities will be constructed would be entirely vegetated in upland grasses and weeds absent wastewater being delivered to those areas. The artificial wetlands present in the wastewater disposal areas are not under ACOE jurisdiction.

**SPECIAL-STATUS SPECIES:** Special-status species are plants and animals that are legally protected under the state and/or federal Endangered Species Act or other regulations. The Federal Endangered Species Act (FESA) of 1973 declares that all federal departments and agencies shall utilize their authority to conserve

endangered and threatened plant and animal species. The California Endangered Species Act (CESA) of 1984 parallels the policies of FESA and pertains to native California species. Both FESA and CESA prohibit unauthorized “take” (i.e., killing) of listed species, with take broadly defined in both acts to include activities such as harassment, pursuit and possession.

Special-status wildlife species also includes species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat. The federal Migratory Bird Treaty Act and Fish and Game Code of California protect special-status bird species year-round, as well as their eggs and nests during the nesting season. Fish and Game Code of California also provides protection for mammals and fish.

Special-status plants are those which are designated rare, threatened, or endangered and candidate species for listing by the USFWS. Special-status plants also include species considered rare or endangered under the conditions of Section 15380 of the California Environmental Quality Act Guidelines, such as those plant species identified on Lists 1A, 1B and 2 in the Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2017). Finally, special-status plants may include other species that are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those included on CNPS List 3.

Table 3 provides a summary of the listing status and habitat requirements of special-status plant and wildlife species that have been documented in the greater project vicinity or for which there is potentially suitable habitat in the project area. This table also includes an assessment of the likelihood of occurrence of each of these species in the site. The evaluation of the potential for



TABLE 3

## SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED IN THE GREATER PROJECT VICINITY

Common Name	Scientific Name	Federal Status <sup>1</sup>	State Status <sup>1</sup>	CNPS List <sup>2</sup>	Habitat	Likelihood of Occurrence in the Project Site
<b>PLANTS</b>						
Big tarplant	<i>Blepharizonia plumosa</i>	None	None	1B	Valley and foothill grassland.	Unlikely: the ruderal grasslands in the site do not provide suitable habitat for this species. The nearest occurrence of big tarplant in the CNDDB (2017) is an historical population near downtown Grayson. The CNDDB notes that this population is possibly extirpated.
Round-leaved filaree	<i>California macrophylla</i>	None	None	1B	Cismontane woodland and valley and foothill grassland.	Unlikely: the ruderal grasslands in the site do not provide suitable habitat for round-leaved filaree. The nearest occurrence of this species in the CNDDB (2017) search area is an historical population near Westley; this occurrence is mapped non-specifically in the vicinity of the WCSD WWTP.
Lemmon's jewelflower	<i>Caulanthus lemmonii</i>	None	None	1B	Pinyon-juniper woodland, valley and foothill grassland.	Unlikely: the ruderal grasslands in the site do not provide suitable habitat for Lemmon's jewelflower. The nearest occurrence of this species in the CNDDB (2017) search area is approximately 3 miles south of the WCSD WWTP.
Delta button celery	<i>Eryngium racemosum</i>	None	E	1B	Seasonally inundated (usually floodplain) riparian scrub with a clay substrate.	Unlikely: while it may occur in nearby San Joaquin River, the project site does not contain suitable habitat for delta button celery. The nearest occurrence of delta button celery in the CNDDB (2017) is an historical population near Grayson; this occurrence is mapped in farmland approximately a mile southwest of the GCSD WWTP. The CNDDB notes that this population is possibly extirpated.
Diamond-petaled California poppy	<i>Eschscholzia rhombipetala</i>	None	None	1B	Valley and foothill grasslands, alkaline, clay slopes and flats.	Unlikely: the ruderal grasslands in the site do not provide suitable habitat for diamond-petaled California poppy. The nearest occurrence of this species in the CNDDB (2017) search area is approximately 3 miles southwest of the project site.

TABLE 3

## SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED IN THE GREATER PROJECT VICINITY

Common Name	Scientific Name	Federal Status <sup>1</sup>	State Status <sup>1</sup>	CNPS List <sup>2</sup>	Habitat	Likelihood of Occurrence in the Project Site
California alkali grass	<i>Puccinellia simplex</i>	None	None	1B	Chenopod scrub, meadows and seeps, valley and foothill grassland, vernal pool habitats; in alkaline, vernal mesic sinks, flats, and lake margins.	Unlikely: there is no suitable habitat in the site for California alkali grass. The nearest occurrence of this species in the CNDDDB (2017) search area is in or along the San Joaquin River, approximately 3.5 miles north of the site.
<b>WILDLIFE BIRDS</b>						
Burrowing owl	<i>Athene cunicularia</i>	None	None	N/A	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation.	Unlikely: the agricultural fields and grasslands in the area provide suitable foraging habitat for burrowing owls. Several ground squirrel burrows were observed in the site, primarily in roads, ditches and fields; none of the burrows had any evidence of occupancy by burrowing owls. The nearest occurrence of this species in the CNDDDB (2017) search area is approximately 2 miles northeast of the GCSD WWTP.
Swainson's hawk	<i>Buteo swainsoni</i>	None	T	N/A	Nesting: large trees, usually within riparian corridors. Foraging: agricultural fields and annual grasslands.	Moderate: cropland and grassland in the site is suitable for foraging and large trees in and near the site are suitable for nesting. During this survey, a Swainson's hawk was observed perched on a telephone pole in the middle of the Grayson WWTP disposal area. The nearest occurrence of nesting Swainson's hawks in the CNDDDB (2017) is along the Tuolumne River, approximately 2.5 miles northeast of the GCSD WWTP.
Tricolored blackbird	<i>Agelaius tricolor</i>	None	CE	N/A	Nests in dense brambles and emergent wetland vegetation associated with open water habitat.	Unlikely: although there is no suitable nesting habitat in or immediately adjacent to the site, this species may fly over or forage in the area. The nearest occurrence of tricolored blackbird in the CNDDDB (2017) search area is approximately 3 miles northwest of the GCSD WWTP.

TABLE 3

## SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED IN THE GREATER PROJECT VICINITY

Common Name	Scientific Name	Federal Status <sup>1</sup>	State Status <sup>1</sup>	CNPS List <sup>2</sup>	Habitat	Likelihood of Occurrence in the Project Site
Least Bell's vireo	<i>Vireo bellii pusillus</i>	E	E	N/A	Nests in willow thickets and other shrubs, primarily in southern California riparian forests.	Unlikely: there is no habitat in the site. Although there is suitable habitat for least Bell's vireo in the greater project vicinity, this species is not known from the area. The nearest occurrence of least Bell's vireo in the CNDDDB (2017) search area is along San Joaquin River, approximately 2 miles northwest of the GCSD WWTP.
Song sparrow ("Modesto" population)	<i>Melospiza melodia</i>	None	SC	N/A	Brackish water marshes. Inhabits cattails, tules, and tangles bordering sloughs.	Unlikely: the project site does not provide suitable habitat for song sparrow. The nearest occurrence of this species in the CNDDDB (2017) search area is at "Dos Rios Ranch", approximately 1.5 miles northeast of the GCSD WWTP.
<b>MAMMALS</b>						
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	E	T	N/A	Annual grasslands or grassy open stages with scattered shrubby vegetation.	Unlikely: the cropland and ruderal grassland in the site provides potentially suitable foraging habitat for San Joaquin kit fox. However, this species primarily occurs in the hills south and west of the site, and is rarely seen on the valley floor. The nearest occurrence of San Joaquin kit fox in the CNDDDB (2017) search area is a 1990 observation of a dead fox along the median on Interstate 5, approximately 2.5 miles southwest of the WCSD WWTP.
Riparian brush rabbit	<i>Sylvilagus bachmani riparius</i>	E	E	N/A	Dense riparian thickets along large rivers in Stanislaus and southern San Joaquin Counties.	Unlikely: the project site does not provide suitable for riparian brush rabbit. The nearest occurrence of riparian brush rabbit in the CNDDDB (2017) search area is at the San Joaquin Wildlife Refuge, approximately 2 miles northwest of the GCSD WWTP.
<b>REPTILES &amp; AMPHIBIANS</b>						
Giant garter snake	<i>Thamnophis gigas</i>	T	T	N/A	Freshwater marsh and low gradient streams; adapted to drainage canals and irrigation ditches, primarily for dispersal or migration.	Unlikely: there is no suitable habitat in the site for giant garter snake. There are no occurrences of giant garter snake in the CNDDDB (2017) search area.

TABLE 3

## SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED IN THE GREATER PROJECT VICINITY

Common Name	Scientific Name	Federal Status <sup>1</sup>	State Status <sup>1</sup>	CNPS List <sup>2</sup>	Habitat	Likelihood of Occurrence in the Project Site
California tiger salamander	<i>Ambystoma californiense</i>	T	T	N/A	Breeds in seasonal water bodies such as deep vernal pools or stock ponds. Requires small mammal burrows for summer refugia.	Unlikely: there are no potentially suitable breeding ponds for California tiger salamander in the site and the cropland near of the site is not suitable for aestivation. The nearest occurrence of this species in the CNDDDB (2017) search area is approximately 3.5 miles northwest of the site. The site is not within an area designated critical habitat for California tiger salamander (USFWS, 2005a).
California red-legged frog	<i>Rana aurora draytonii</i>	T	SC	N/A	Lowlands and foothills in or near permanent sources of water with vegetation.	Unlikely: there is no suitable aquatic habitat for California red-legged frog in or near the site. There are no occurrences of this species recorded in the CNDDDB (2017) search area. The site is not in designated for California red-legged frog critical habitat (USFWS, 2006).
<b>FISH</b>						
Steelhead – Central Valley DPS	<i>Oncorhynchus mykiss irideus</i>	T	None	N/A	Riffle and pool complexes with adequate spawning substrates within Central Valley drainages.	None: there is no aquatic habitat in the site. The nearest occurrence of Central Valley steelhead in the CNDDDB (2017) search area is in the San Joaquin River, approximately 1 mile northeast of the Grayson WWTP. The site is not within designated critical habitat for this species (NOAA, 2005).
Delta smelt	<i>Hypomesus transpacificus</i>	T	T	N/A	Shallow lower delta waterways with submersed aquatic plants and other suitable refugia.	Unlikely: there is no suitable aquatic habitat for delta smelt in or near the site. There are no occurrences of delta smelt recorded in the CNDDDB (2017) within the search area. There is no designated critical habitat for delta smelt (USFWS, 1994) in or near the site.
Hardhead	<i>Mylopharodon conocephalus</i>	None	SC	N/A	Clear, deep pools with sand and gravel bottoms in tributaries to the San Joaquin and Sacramento River.	Unlikely: the San Joaquin River and Tuolumne River in the general project vicinity provide suitable habitat for hardhead. The closest occurrence of hardhead in the CNDDDB (2017) approximately 2.5 miles northeast of the GCSD WWTP in the Tuolumne River.

TABLE 3

## SPECIAL-STATUS PLANT AND WILDLIFE SPECIES DOCUMENTED IN THE GREATER PROJECT VICINITY

Common Name	Scientific Name	Federal Status <sup>1</sup>	State Status <sup>1</sup>	CNPS List <sup>2</sup>	Habitat	Likelihood of Occurrence in the Project Site
<b>INVERTEBRATES</b>						
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	T	None	N/A	Vernal pools and seasonally inundated depressions in the Central Valley.	Unlikely: there are no vernal pools or seasonal wetlands in the site. The closest occurrence of the vernal pool fairy shrimp in the CNDDDB (2017) search area is 2 miles northwest of the Grayson WWTP at the San Joaquin River Preserve. The site is not within designated critical habitat for vernal pool fairy shrimp (USFWS, 2005b).
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	E	None	N/A	Vernal pools	Unlikely: there are no vernal pools in the site. There is no occurrence of this species in the CNDDDB (2017) search area. The site is not within designated critical habitat for the Conservancy fairy shrimp (USFWS, 2005b).
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	E	None	N/A	Vernal pools and seasonally wet depressions within the Central Valley	Unlikely: there are no vernal pools or seasonal wetlands in the site. There are no occurrences of vernal pool tadpole shrimp in the CNDDDB (2017) search area. The site is not within designated critical habitat for vernal pool tadpole shrimp (USFWS, 2005b).
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	T	None	N/A	Elderberry shrubs in the Central Valley and surrounding foothills	Unlikely: no blue elderberry shrubs were observed in the site. The nearest occurrence of valley elderberry longhorn beetle in the CNDDDB (2017) in the search area is approximately 3.5 miles northwest of the GCSD WWTP. The site is not within designated critical habitat for this species (USFWS, 1980).

## Notes:

- <sup>1</sup> T= Threatened; E = Endangered; CE= Candidate for listing as an Endangered Species; SC = Species of Special Concern per California Department of Fish and Wildlife.
- <sup>2</sup> CNPS List 1B includes species that are rare, threatened, or endangered in California and elsewhere; List 2 includes plants that are rare, threatened or endangered in California but are more common elsewhere.

occurrence of each species is based on the distribution of regional occurrences (if any), habitat suitability, and field observations.

**SPECIAL-STATUS PLANTS:** Only six species of special-status plants were identified in the CNDDDB (2017) search: big tarplant (*Blepharizonia plumosa*), round-leaved filaree (*California macrophylla*), Lemmon's jewelflower (*Caulanthus lemmonii*), Delta button celery (*Eryngium racemosum*), diamond-petaled California poppy (*Eschscholzia rhombipetala*), and California alkali grass (*Puccinellia simplex*) (Table 3 and Attachment A). There are no special-status plants included in the USFWS IPaC Trust Resource Report (Attachment A).

Most of the special-status plants identified in the CNDDDB (2017) query in the project vicinity (Table 3) occur in relatively undisturbed areas within vegetation communities such as marshes, swamps, alkali playas, vernal pools, and chenopod scrub. None of these habitat types occur in the site and due to lack of suitable habitat, no special-status plant species are expected to occur in the site. The wastewater disposal areas and areas of ruderal grassland vegetation in the project site are highly disturbed and do not provide suitable habitat for the species in Table 3 or any other special-status plants.

**SPECIAL-STATUS WILDLIFE:** The potential for intensive use of habitats within the project site by special-status wildlife species is generally low. Special-status wildlife species that have been recorded in greater project vicinity in the CNDDDB (2017) include: Swainson's hawk, burrowing owl, tricolored blackbird (*Agelaius tricolor*), least Bell's vireo (*Vireo bellii pusillus*), song sparrow ("Modesto population") (*Melospiza melodia*), San Joaquin kit fox (*Vulpes macrotis mutica*), riparian brush rabbit (*Sylvilagus bachmani riparius*), California tiger salamander (*Ambystoma californiense*), steelhead – Central valley DPS (*Oncorhynchus mykiss irideus*), hardhead (*Mylopharodon conocephalus*), vernal pool fairy shrimp (*Branchinecta lynchi*) and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). Although not included in the CNDDDB within the search

area, giant garter snake (*Thamnophis gigas*), California red-legged frog (*Rana aurora draytonii*), delta smelt (*Hypomesus transpacificus*), Conservancy fairy shrimp (*Branchinecta conservatio*), and vernal pool tadpole shrimp (*Lepidurus packardii*) were added to Table 3 because they are included in the USFWS IPaC Trust Resource Report (Attachment A).

The project site and surrounding areas may have provided habitat for the special-status wildlife species listed in Table 3 at some time in the past. However, farming, development, and construction and maintenance of roads, fences, and irrigation facilities have substantially modified natural habitats within the greater project vicinity. Of the wildlife species identified in the CNDDDB, Swainson's hawk and burrowing owl are the only species that have much potential to occur in the project site on more than a transitory or very occasional basis. These species are discussed further below because they could be disturbed by noise if they nested on or near the project site during construction.

**SWAINSON'S HAWK:** The Swainson's hawk is a migratory hawk listed by the State of California as a Threatened species. The Migratory Bird Treaty Act and Fish and Game Code of California protect Swainson's hawks year-round, as well as their nests during the nesting season (March 1 through September 15). Swainson's hawk are found in the Central Valley primarily during their breeding season, a population is known to winter in the San Joaquin Valley.

Swainson's hawks prefer nesting sites that provide sweeping views of nearby foraging grounds consisting of grasslands, irrigated pasture, hay, and wheat crops. Most Swainson's hawks are migratory, wintering in Mexico and breeding in California and elsewhere in the western United States. This raptor generally arrives in the Central Valley in mid-March, and begins courtship and nest construction immediately upon arrival at the breeding sites. The young fledge in early July, and most Swainson's hawks leave their breeding territories by late August.

The CNDDDB (2017) contains only a few records of Swainson's hawks in the greater project vicinity. The nearest occurrence of nesting Swainson's hawks in the CNDDDB (2017) search area is a historical record of an adult pair seen foraging and nesting along the Tuolumne River approximately a quarter mile east of the confluence with the San Joaquin River; this location is 2.5 miles northeast of the GCSD WWTP. A Swainson's hawk was seen during the survey perched on a telephone pole at the GCSD WWTP.

The annual cropland and grasslands in the region provide suitable foraging habitat for this species; the on-site grasslands provide low quality foraging habitat. There are only a few suitable nest trees for Swainson's hawk in or immediately adjacent to the site. In contrast, there are numerous suitable nest trees in the greater project vicinity, primarily along the river corridor near the Grayson WWTP. The annual cropland and grasslands in the region provide suitable foraging habitat for this species.

**BURROWING OWL:** The Migratory Bird Treaty Act and Fish and Game Code of California protect burrowing owls year-round, as well as their nests during the nesting season (February 1 through August 31). Burrowing owls are a year-long resident in a variety of grasslands as well as scrub lands that have a low density of trees and shrubs with low growing vegetation; burrowing owls that nest in the Central Valley may winter elsewhere.

The primary habitat requirement of the burrowing owl is small mammal burrows for nesting. The owl usually nests in abandoned ground squirrel burrows, although they have been known to dig their own burrows in softer soils. In urban areas, burrowing owls often utilize artificial burrows including pipes, culverts, and piles of concrete pieces. This semi-colonial owl breeds from March through August, and is most active while hunting during dawn and dusk. The nearest occurrence of this species in the CNDDDB (2017) search area is approximately 2 miles northeast of the GCSD WWTP near the junction of the Tuolumne River and



the San Joaquin River. The record was an adult burrowing owl near a burrow under an exposed aggregate slab associated with a culvert.

The intensity of development, irrigation, and cultivation within and surrounding the site reduces the likelihood of burrowing owls using the site for nesting. No burrowing owls were observed in the project site during the recent survey. Several clusters of ground squirrel burrows were observed in the site, providing possible burrow habitat for burrowing owls. However, none of these burrows had evidence of burrowing owl occupancy.

**OTHER SPECIAL-STATUS SPECIES:** The site does not provide suitable aquatic habitat for any type of fish, giant garter snake, California tiger salamander, or California red-legged frog. There is no emergent wetland habitat in the site for nesting tricolored blackbirds. While there may be suitable habitat for least Bell's vireo in the project vicinity, this species is not known from the area and there is no habitat in the site. There are no brackish water marshes in the site for the song sparrow to utilize for nesting and foraging. There are no vernal pools or seasonal wetlands in the site for vernal pool branchiopods (i.e., fairy and tadpole shrimp). There are no blue elderberry shrubs in the site, precluding the potential occurrence of valley elderberry longhorn beetle.

The ruderal grassland in the site provides potentially suitable foraging habitat for San Joaquin kit fox, but there is no suitable denning habitat in the site for this species. San Joaquin kit fox also primarily occurs in the hills south and west of the site, and is rarely seen on the valley floor. There is no suitable habitat in the site for the riparian brush rabbit.

**CRITICAL HABITAT:** The site is not within designated critical habitat for California red-legged frog (USFWS, 2006), California tiger salamander (USFWS, 2005a), federally listed vernal pool shrimp or plants (USFWS, 2005b), delta smelt

(USFWS, 1994), valley elderberry longhorn beetle (USFWS, 1980), or Central Valley steelhead (NOAA, 2005) (Attachment C).

## **Conclusions and Recommendations**

- The site consists of two wastewater treatment plants and highly disturbed habitats in urban and agricultural areas. On-site habitats are biologically unremarkable.
- No potentially jurisdictional Waters of the U.S. or wetlands were observed in the site.
- No riparian habitats or other sensitive natural communities were observed in the site. The nearby San Joaquin River riparian corridor is outside the limits of work and there will be no impact to this vegetation community.
- Due to a lack of suitable habitat, it is unlikely that special-status plants occur in the site.
- With the exception of Swainson's hawk and burrowing owl, no special-status wildlife species are expected to occur in or near the site on more than a very occasional or transitory basis.
- Pre-construction surveys for nesting Swainson's hawks within 0.5 miles of the project site are recommended if construction commences between March 1 and September 15. If active nests are found, a qualified biologist should determine the need (if any) for temporal restrictions on construction. The determination should be pursuant to criteria set forth by CDFW (CDFG, 1994).

- Pre-construction surveys for burrowing owls within 250 feet of the site are recommended if construction commences between February 1 and August 31. If occupied burrows are found, a qualified biologist should determine the need (if any) for temporal restrictions on construction. The determination should be pursuant to criteria set forth by CDFW (CDFG, 2012).
- On-site trees, shrubs, and grasslands could be used by birds protected by the Migratory Bird Treaty Act of 1918 and/or Fish and Game Code of California. If construction commences during the general avian nesting season (March 1 through July 31), a pre-construction survey for nesting birds is recommended. If active nests are found, work in the vicinity of the nest should be delayed until the young fledge.
- The project will not result in a “take” (i.e., killing, pursuit, harassment, harming, wounding, collecting, capture, hunting, etc.) of listed or threatened or endangered plant or wildlife species.
- The project will have no effect on designated critical habitat.

Thank you, again, for asking Moore Biological Consultants to assist with the project. Please call me at (209) 745-1159 with any questions.

Sincerely,



Diane S. Moore, M.S.  
Principal Biologist

## References and Literature Consulted

ACOE (U.S. Army Corps of Engineers). 1987. Technical Report Y87-1. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MI.

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Sawyer, J.O. and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento. California.

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USFWS. 2005a. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the California Tiger Salamander, Central Population; Final Rule. Federal Register Vol. 70, No. 162, August 23, 2005, pp. 49390 – 49458.

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USFWS. 2006. Part II, Department of the Interior, Fish and Wildlife Service. 50 CFR Part 17: Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for California Red-Legged Frog, and Special Rule Exemption Associated with Final Listing for Existing Routine Ranching Activities, Final Rule. Federal Register Vol. 71, No. 71, April 13.

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Attachment A

CNDDDB Summary Report and Exhibits

& USFWS IPaC Trust Report



**Selected Elements by Scientific Name**  
**California Department of Fish and Wildlife**  
**California Natural Diversity Database**



Query Criteria: Quad<span style='color:Red'> IS </span>(Westley (3712152))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<b><i>Agelaius tricolor</i></b> tricolored blackbird	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
<b><i>Ambystoma californiense</i></b> California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
<b><i>Athene cunicularia</i></b> burrowing owl	ABNSB10010	None	None	G4	S3	SSC
<b><i>Blepharizonia plumosa</i></b> big tarplant	PDAST1C011	None	None	G2	S2	1B.1
<b><i>Branchinecta lynchi</i></b> vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
<b><i>Branta hutchinsii leucopareia</i></b> cackling (=Aleutian Canada) goose	ABNJB05035	Delisted	None	G5T3	S3	
<b><i>Buteo swainsoni</i></b> Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
<b><i>California macrophylla</i></b> round-leaved filaree	PDGER01070	None	None	G3?	S3?	1B.2
<b><i>Caulanthus lemmonii</i></b> Lemmon's jewelflower	PDBRA0M0E0	None	None	G3	S3	1B.2
<b><i>Coastal and Valley Freshwater Marsh</i></b> Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
<b><i>Desmocerus californicus dimorphus</i></b> valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
<b><i>Eryngium racemosum</i></b> Delta button-celery	PDAPI0Z0S0	None	Endangered	G1	S1	1B.1
<b><i>Eschscholzia rhombipetala</i></b> diamond-petaled California poppy	PDPAP0A0D0	None	None	G1	S1	1B.1
<b><i>Great Valley Valley Oak Riparian Forest</i></b> Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
<b><i>Lytta moesta</i></b> moestan blister beetle	IICOL4C020	None	None	G2	S2	
<b><i>Melospiza melodia</i></b> song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
<b><i>Mylopharodon conocephalus</i></b> hardhead	AFCJB25010	None	None	G3	S3	SSC
<b><i>Oncorhynchus mykiss irideus</i></b> steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
<b><i>Puccinellia simplex</i></b> California alkali grass	PMPOA53110	None	None	G3	S2	1B.2
<b><i>Sylvilagus bachmani riparius</i></b> riparian brush rabbit	AMAEB01021	Endangered	Endangered	G5T1	S1	



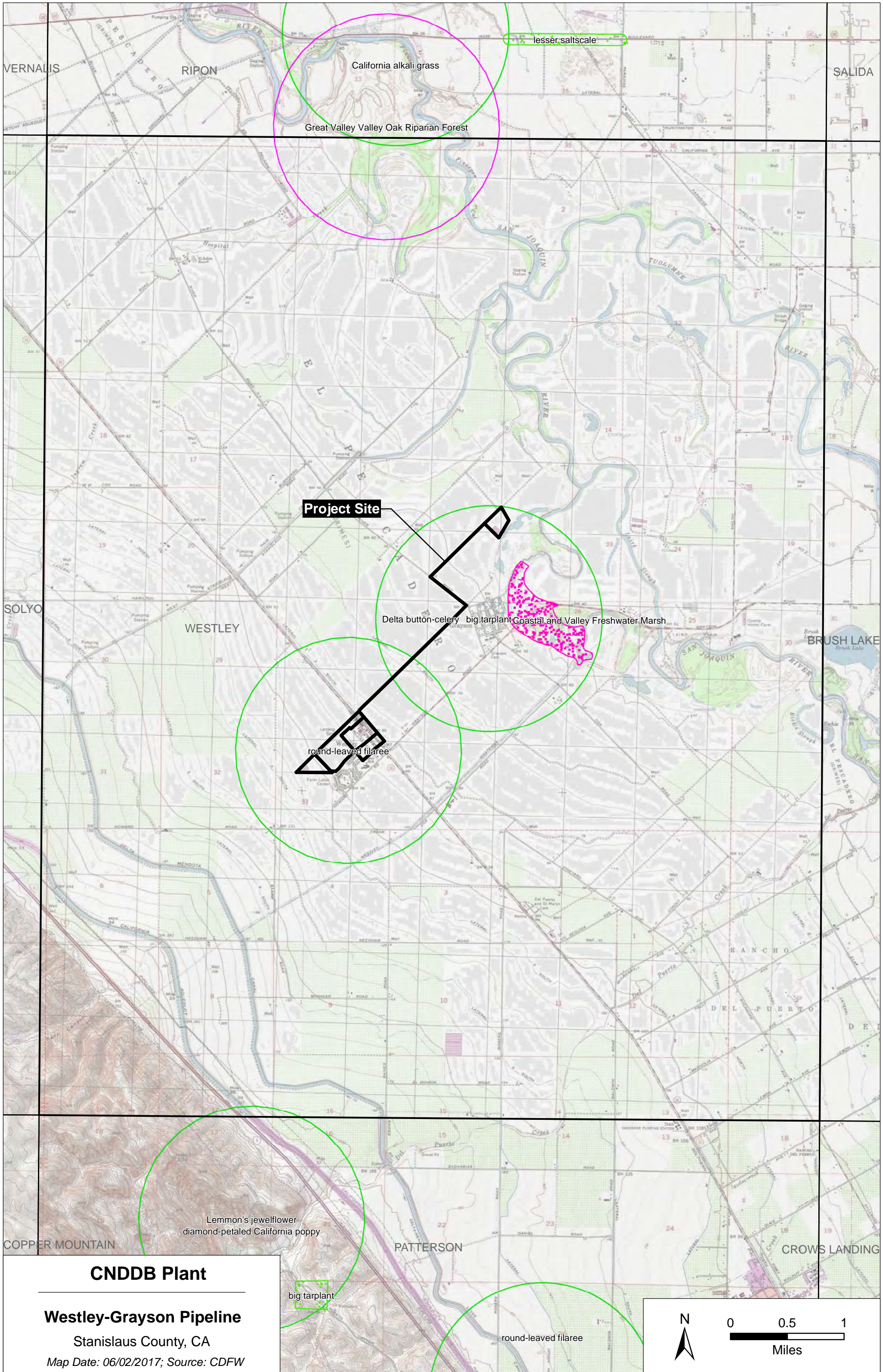
**Selected Elements by Scientific Name**  
**California Department of Fish and Wildlife**  
**California Natural Diversity Database**



<b>Species</b>	<b>Element Code</b>	<b>Federal Status</b>	<b>State Status</b>	<b>Global Rank</b>	<b>State Rank</b>	<b>Rare Plant Rank/CDFW SSC or FP</b>
<i>Vireo bellii pusillus</i> least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2	S2	

**Record Count: 22**





**Project Site**

round-leaved filaree

Delta button-celery big tarplant Coastal and Valley Freshwater Marsh

California alkali grass

Great Valley Valley Oak Riparian Forest

lesser saltscare

Lemmon's jewelflower  
diamond-petaled California poppy

big tarplant

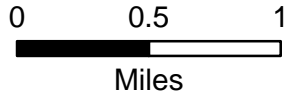
round-leaved filaree

**CNDDDB Plant**

**Westley-Grayson Pipeline**

Stanislaus County, CA

Map Date: 06/02/2017; Source: CDFW





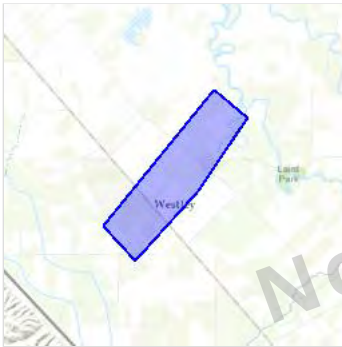
# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Stanislaus County, California



## Local office

Sacramento Fish And Wildlife Office

☎ (916) 414-6600

📠 (916) 414-6713

Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846

# Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service.

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.

The following species are potentially affected by activities in this location:

## Mammals

NAME	STATUS
Riparian Brush Rabbit <i>Sylvilagus bachmani riparius</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/6189">https://ecos.fws.gov/ecp/species/6189</a>	Endangered
San Joaquin Kit Fox <i>Vulpes macrotis mutica</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/2873">https://ecos.fws.gov/ecp/species/2873</a>	Endangered

## Birds

NAME	STATUS
Least Bell's Vireo <i>Vireo bellii pusillus</i> There is a <b>final critical habitat</b> designated for this species. Your location is outside the designated critical habitat. <a href="https://ecos.fws.gov/ecp/species/5945">https://ecos.fws.gov/ecp/species/5945</a>	Endangered

## Reptiles

NAME	STATUS
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/4482">https://ecos.fws.gov/ecp/species/4482</a>	Threatened

## Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is a <b>final critical habitat</b> designated for this species. Your location is outside the designated critical habitat. <a href="https://ecos.fws.gov/ecp/species/2891">https://ecos.fws.gov/ecp/species/2891</a>	Threatened

California Tiger Salamander <i>Ambystoma californiense</i>	Threatened
There is a <b>final critical habitat</b> designated for this species. Your location is outside the designated critical habitat.	
<a href="https://ecos.fws.gov/ecp/species/2076">https://ecos.fws.gov/ecp/species/2076</a>	

## Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i>	Threatened
There is a <b>final critical habitat</b> designated for this species. Your location is outside the designated critical habitat.	
<a href="https://ecos.fws.gov/ecp/species/321">https://ecos.fws.gov/ecp/species/321</a>	
Steelhead <i>Oncorhynchus (=Salmo) mykiss</i>	Threatened
There is a <b>final critical habitat</b> designated for this species. Your location overlaps the designated critical habitat.	
<a href="https://ecos.fws.gov/ecp/species/1007">https://ecos.fws.gov/ecp/species/1007</a>	

## Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i>	Threatened
There is a <b>final critical habitat</b> designated for this species. Your location is outside the designated critical habitat.	
<a href="https://ecos.fws.gov/ecp/species/7850">https://ecos.fws.gov/ecp/species/7850</a>	

## Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp <i>Branchinecta conservatio</i>	Endangered
There is a <b>final critical habitat</b> designated for this species. Your location is outside the designated critical habitat.	
<a href="https://ecos.fws.gov/ecp/species/8246">https://ecos.fws.gov/ecp/species/8246</a>	
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i>	Threatened
There is a <b>final critical habitat</b> designated for this species. Your location is outside the designated critical habitat.	
<a href="https://ecos.fws.gov/ecp/species/498">https://ecos.fws.gov/ecp/species/498</a>	
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i>	Endangered
There is a <b>final critical habitat</b> designated for this species. Your location is outside the designated critical habitat.	
<a href="https://ecos.fws.gov/ecp/species/2246">https://ecos.fws.gov/ecp/species/2246</a>	

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Steelhead <i>Oncorhynchus (=Salmo) mykiss</i> Southern California DPS	Final designated
<a href="https://ecos.fws.gov/ecp/species/1007#crithab">https://ecos.fws.gov/ecp/species/1007#crithab</a>	
Steelhead <i>Oncorhynchus (=Salmo) mykiss</i> Central California Coast DPS	Final designated
<a href="https://ecos.fws.gov/ecp/species/1007#crithab">https://ecos.fws.gov/ecp/species/1007#crithab</a>	
Steelhead <i>Oncorhynchus (=Salmo) mykiss</i> California Central Valley DPS	Final designated
<a href="https://ecos.fws.gov/ecp/species/1007#crithab">https://ecos.fws.gov/ecp/species/1007#crithab</a>	

Steelhead *Oncorhynchus* (=Salmo) mykiss  
Northern California DPS  
<https://ecos.fws.gov/ecp/species/1007#crithab>

Final designated

Steelhead *Oncorhynchus* (=Salmo) mykiss  
South-Central California Coast DPS  
<https://ecos.fws.gov/ecp/species/1007#crithab>

Final designated

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service<sup>3</sup>. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Conservation measures for birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Year-round bird occurrence data <http://www.birdscanada.org/birdmon/default/datasummaries.jsp>

The migratory birds species listed below are species of particular conservation concern (e.g. [Birds of Conservation Concern](#)) that may be potentially affected by activities in this location. It is not a list of every bird species you may find in this location, nor a guarantee that all of the bird species on this list will be found on or near this location. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To view available data on other bird species that may occur in your project area, please visit the [AKN Histogram Tools](#) and [Other Bird Data Resources](#). To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

NAME	SEASON(S)
Allen's Hummingbird <i>Selasphorus sasin</i> <a href="https://ecos.fws.gov/ecp/species/9637">https://ecos.fws.gov/ecp/species/9637</a>	Migrating
Bald Eagle <i>Haliaeetus leucocephalus</i> <a href="https://ecos.fws.gov/ecp/species/1626">https://ecos.fws.gov/ecp/species/1626</a>	Year-round
Black Rail <i>Laterallus jamaicensis</i> <a href="https://ecos.fws.gov/ecp/species/7717">https://ecos.fws.gov/ecp/species/7717</a>	Breeding
Burrowing Owl <i>Athene cunicularia</i> <a href="https://ecos.fws.gov/ecp/species/9737">https://ecos.fws.gov/ecp/species/9737</a>	Year-round
Costa's Hummingbird <i>Calypte costae</i> <a href="https://ecos.fws.gov/ecp/species/9470">https://ecos.fws.gov/ecp/species/9470</a>	Year-round
Fox Sparrow <i>Passerella iliaca</i>	Wintering
Lawrence's Goldfinch <i>Carduelis lawrencei</i> <a href="https://ecos.fws.gov/ecp/species/9464">https://ecos.fws.gov/ecp/species/9464</a>	Breeding
Least Bittern <i>Ixobrychus exilis</i> <a href="https://ecos.fws.gov/ecp/species/6175">https://ecos.fws.gov/ecp/species/6175</a>	Breeding
Lesser Yellowlegs <i>Tringa flavipes</i> <a href="https://ecos.fws.gov/ecp/species/9679">https://ecos.fws.gov/ecp/species/9679</a>	Wintering

Lewis's Woodpecker <i>Melanerpes lewis</i> <a href="https://ecos.fws.gov/ecp/species/9408">https://ecos.fws.gov/ecp/species/9408</a>	Wintering
Loggerhead Shrike <i>Lanius ludovicianus</i> <a href="https://ecos.fws.gov/ecp/species/8833">https://ecos.fws.gov/ecp/species/8833</a>	Year-round
Long-billed Curlew <i>Numenius americanus</i> <a href="https://ecos.fws.gov/ecp/species/5511">https://ecos.fws.gov/ecp/species/5511</a>	Wintering
Marbled Godwit <i>Limosa fedoa</i> <a href="https://ecos.fws.gov/ecp/species/9481">https://ecos.fws.gov/ecp/species/9481</a>	Wintering
Mountain Plover <i>Charadrius montanus</i> <a href="https://ecos.fws.gov/ecp/species/3638">https://ecos.fws.gov/ecp/species/3638</a>	Wintering
Nuttall's Woodpecker <i>Picoides nuttallii</i> <a href="https://ecos.fws.gov/ecp/species/9410">https://ecos.fws.gov/ecp/species/9410</a>	Year-round
Oak Titmouse <i>Baeolophus inornatus</i> <a href="https://ecos.fws.gov/ecp/species/9656">https://ecos.fws.gov/ecp/species/9656</a>	Year-round
Peregrine Falcon <i>Falco peregrinus</i> <a href="https://ecos.fws.gov/ecp/species/8831">https://ecos.fws.gov/ecp/species/8831</a>	Year-round
Rufous Hummingbird <i>selasphorus rufus</i> <a href="https://ecos.fws.gov/ecp/species/8002">https://ecos.fws.gov/ecp/species/8002</a>	Migrating
Short-eared Owl <i>Asio flammeus</i> <a href="https://ecos.fws.gov/ecp/species/9295">https://ecos.fws.gov/ecp/species/9295</a>	Wintering
Swainson's Hawk <i>Buteo swainsoni</i> <a href="https://ecos.fws.gov/ecp/species/1098">https://ecos.fws.gov/ecp/species/1098</a>	Breeding
Western Grebe <i>aechmophorus occidentalis</i> <a href="https://ecos.fws.gov/ecp/species/6743">https://ecos.fws.gov/ecp/species/6743</a>	Wintering
Yellow-billed Magpie <i>Pica nuttalli</i> <a href="https://ecos.fws.gov/ecp/species/9726">https://ecos.fws.gov/ecp/species/9726</a>	Year-round

#### What does IPaC use to generate the list of migratory bird species potentially occurring in my specified location?

##### Landbirds:

Migratory birds that are displayed on the IPaC species list are based on ranges in the latest edition of the National Geographic Guide, Birds of North America (6th Edition, 2011 by Jon L. Dunn, and Jonathan Alderfer). Although these ranges are coarse in nature, a number of U.S. Fish and Wildlife Service migratory bird biologists agree that these maps are some of the best range maps to date. These ranges were clipped to a specific Bird Conservation Region (BCR) or USFWS Region/Regions, if it was indicated in the 2008 list of Birds of Conservation Concern (BCC) that a species was a BCC species only in a particular Region/Regions. Additional modifications have been made to some ranges based on more local or refined range information and/or information provided by U.S. Fish and Wildlife Service biologists with species expertise. All migratory birds that show in areas on land in IPaC are those that appear in the 2008 Birds of Conservation Concern report.

##### Atlantic Seabirds:

Ranges in IPaC for birds off the Atlantic coast are derived from species distribution models developed by the National Oceanic and Atmospheric Association (NOAA) National Centers for Coastal Ocean Science (NCCOS) using the best available seabird survey data for the offshore Atlantic Coastal region to date. NOAA/NCCOS assisted USFWS in developing seasonal species ranges from their models for specific use in IPaC. Some of these birds are not BCC species but were of interest for inclusion because they may occur in high abundance off the coast at different times throughout the year, which potentially makes them more susceptible to certain types of development and activities taking place in that area. For more refined details about the abundance and richness of bird species within your project area off the Atlantic Coast, see the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other types of taxa that may be helpful in your project review.

About the NOAA/NCCOS models: the models were developed as part of the NOAA/NCCOS project: [Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#). The models resulting from this project are being used in a number of decision-support/mapping products in order to help guide decision-making on activities off the Atlantic Coast with the goal of reducing impacts to migratory birds. One such product is the [Northeast Ocean Data Portal](#), which can be used to explore details about the relative occurrence and abundance of bird species in a particular area off the Atlantic Coast.

All migratory bird range maps within IPaC are continuously being updated as new and better information becomes available.

Can I get additional information about the levels of occurrence in my project area of specific birds or groups of birds listed in IPaC?

#### Landbirds:

The [Avian Knowledge Network \(AKN\)](#) provides a tool currently called the "Histogram Tool", which draws from the data within the AKN (latest, survey, point count, citizen science datasets) to create a view of relative abundance of species within a particular location over the course of the year. The results of the tool depict the frequency of detection of a species in survey events, averaged between multiple datasets within AKN in a particular week of the year. You may access the histogram tools through the [Migratory Bird Programs AKN Histogram Tools](#) webpage.

The tool is currently available for 4 regions (California, Northeast U.S., Southeast U.S. and Midwest), which encompasses the following 32 states: Alabama, Arkansas, California, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin.

In the near future, there are plans to expand this tool nationwide within the AKN, and allow the graphs produced to appear with the list of trust resources generated by IPaC, providing you with an additional level of detail about the level of occurrence of the species of particular concern potentially occurring in your project area throughout the course of the year.

#### Atlantic Seabirds:

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA/COS [Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project](#) webpage.

## Facilities

### Wildlife refuges

Any activity proposed on [National Wildlife Refuge](#) lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuges:

REFUGE	ACRES
San Joaquin River National Wildlife Refuge	14,140.32 acres

☎ (209) 826-3508

📠 (209) 826-1445

#### MAILING ADDRESS

C/o San Luis Nwr Complex  
P.O. Box 2176  
Los Banos, CA 93635-2176

#### PHYSICAL ADDRESS

2714 Dairy Road  
Vernalis, CA 95385-9706

<https://www.fws.gov/refuges/profiles/index.cfm?id=81654>

### Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

## Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

This location overlaps the following wetlands:

#### FRESHWATER FORESTED/SHRUB WETLAND

[PFO/EMC](#)

[PSSC](#)

[PFOA](#)



A full description for each wetland code can be found at the National Wetlands Inventory website: <https://ecos.fws.gov/ipac/wetlands/decoder>

#### **Data limitations**

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

#### **Data exclusions**

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

#### **Data precautions**

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Attachment B

Photographs



Westley WWTP Ponds, looking southeast; 05/30/17.



Existing disposal area in the Westley WWTP, looking east; 05/30/17.



Farm road and runway just northeast of the Westley WWTP, looking northeast; 05/30/17. The proposed pipeline will be constructed along the farm road north of the runway.



Farm road and irrigation and/or drainage ditch just northeast of the Farm Labor Housing Complex, looking northeast; 05/30/17. Alternatively, the pipeline may be constructed along this farm road.



B Street in the community of Westley looking northeast; 05/30/17. The pipeline may be constructed along this street or along another parallel street a bit further north.



B Street in the community of Westley looking northeast; 05/30/17. Construction of the pipeline along this alignment would involve a bore & jack under this building and the railroad tracks.



Concrete-lined irrigation lateral just east of the railroad tracks in Westley; 05/30/17. The pipeline will be bore & jacked under this lateral and under the railroad tracks.



Ruderal grassland between the lateral and the railroad tracks, looking southwest; 05/30/17.



West Stanislaus Irrigation District Lateral that will be crossed by the pipeline, looking northwest; 05/30/17. The pipeline may be trenched under the culvert to minimize disturbance to the lateral.



Irrigation ditch that can deliver water from the above lateral to the fields, looking northwest 05/30/17. The proposed pipeline will follow one of the farm roads that is adjacent to the ditch.



Farm road southwest of the Grayson WWTP, looking southwest; 05/30/17. The new pipeline will be constructed along this road, other similar dirt farm roads, and some county roads.



River Road, just northwest of the community of Grayson, looking northwest; 05/30/17. The new pipeline will be constructed either in the road or along one of the road shoulders.





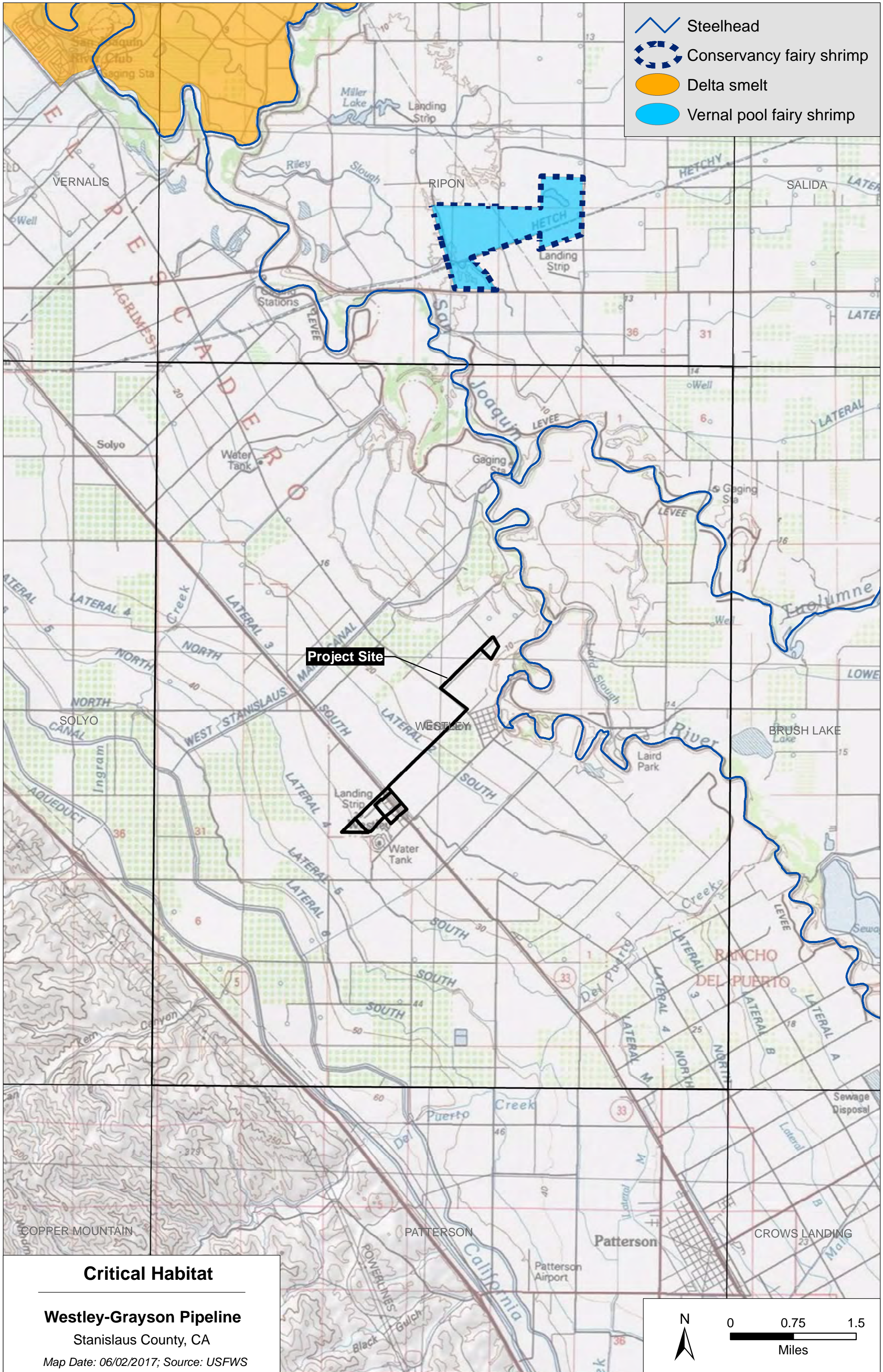
Grayson WWTP Ponds, looking east toward the San Joaquin River corridor; 05/30/17.



Existing disposal area in the Grayson WWTP, looking southwest toward the ponds; 05/30/17.

Appendix C

Designated Critical Habitat



-  Steelhead
-  Conservancy fairy shrimp
-  Delta smelt
-  Vernal pool fairy shrimp

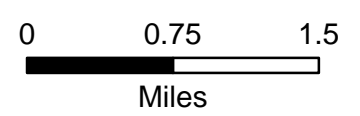
**Project Site**

**Critical Habitat**

**Westley-Grayson Pipeline**

Stanislaus County, CA

Map Date: 06/02/2017; Source: USFWS



**APPENDIX C  
CULTURAL RESOURCES**

Appendix C is available to qualified reviewers at the Westley  
Community Service District,  
254 Sperry Road, Suite 1 Patterson, CA