ADOPTION OF EXISTING ENVIRONMETNAL DOCUMENT

Washington Administrative Code 197-11-965

Seattle-Tacoma International Airport (STIA)

International Arrivals Facility (IAF)

Adoption for (check appropriate box)
[X] DNS [ ] EIS [ ] Other:

Description of proposal: The Port of Seattle, Seattle-Tacoma International Airport, is proposing the construction of a new landside facility - the International Arrivals Facility (IAF). The IAF will consist of three primary building components: a bridge connecting the existing SSAT to the A Concourse, a sterile corridor and vertical circulation cores on Concourse A, and a new IAF/Federal Inspection Services (FIS) facility. The IAF would be located adjacent and connected to Concourse A and have a footprint of ~181,000 square feet or ~360,000 gross square feet. The IAF would house multiple Department of Homeland Security agency facilities and facilitate the movement of international passengers. The proposed project would not expand overall airport capacity, create new gates, or change the existing aircraft fleet mix, and there would be no new access to airport roadways as a result of this project. The proposed project would include the following elements:

- Construction of a new IAF/FIS facility east of and connected to Concourse A;
- Construction of an elevated sterile corridor and vertical circulation core west of and connected above Concourse A;
- Construction of an elevated pedestrian bridge from the SSAT to the Concourse A sterile corridor;
- Modification of existing aircraft parking layout (i.e. no new gates) at Concourse A (4 to 8 widebody positions) and SSAT (10 to 12 widebody positions) to accommodate widebody aircraft;
- Temporary relocation of the South Ground Transportation Lot during construction; and
- Pursuit of United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) certification for the facility.
- The project is slated to begin construction in second quarter 2016 with the facility complete in 2018 and operational in 2019.

Proponent: Port of Seattle, Seattle-Tacoma International Airport

Location of current proposal: Seattle-Tacoma International Airport
17801 Pacific Highway South
Seattle, WA 98158

Title of document being adopted: Federal Aviation Administration ARP SOP 5.00 – NEPA Documented CatEx – International Arrivals Facility

Agency that prepared document being adopted: Port of Seattle

Date adopted document was prepared: Accepted by the Federal Aviation Administration on April 22, 2015

Description of document (or portion) being adopted: Adoption of the Federal Aviation Administration ARP SOP 5.00 – NEPA Documented CatEx – International Arrivals Facility

If the document being adopted has been challenged (WAC 197-11-630), please describe: The Federal Aviation Administration ARP SOP 5.00 – NEPA Documented CatEx – International Arrivals Facility was not challenged.

The document is available to be read at (place/time): Attached to this document and available at Environmental Program Department, Second Floor, Pier 69, 2711 Alaskan Way, Seattle. The document is also available for review online at http://www.portseattle.org/Environmental/Environmental-Documents/SEPA-NEPA/Pages/default.aspx.

We have identified and adopted this document as being appropriate for this proposal after independent review. The document meets our environmental review needs for the current proposal and will accompany the proposal to the decision maker.

Name of agency adopting document: Port of Seattle

Contact person, if other than responsible official: Steve Rybolt
Aviation Environmental Programs

Phone / email: (206) 787-5527 / Rybolt.S@portseattle.org

Responsible Official: Elizabeth Leavitt
Position/title: Director, Aviation Planning and Environmental Programs
Phone: (206) 787-5525
Address: P.O. Box 68727
Seattle, WA 98168

E Leavitt 5/5/15

Signature Date

SUPPLEMENTAL ENVIRONMENTAL CHECKLIST

Seattle-Tacoma International Airport (STIA)

International Arrivals Facility (IAF)

Washington Administrative Code 197-11-610(2) – Use of NEPA Documents. A National Environmental Policy Act environmental assessment (EA) or documented categorical exclusion may be adopted to support a determination of non-significance instead of preparing an environmental checklist, if the requirements of WAC 197-11-340, 197-11-600, and 197-11-630 (and WAC 197-11-350 and 197-11-355 as applicable), are met and elements of the environment in WAC 197-11-444 are adequately addressed.

On April 22, 2015 the Federal Aviation Administration (FAA), after reviewing the Documented Categorical Exclusion (DCE) for the International Arrivals Facility (IAF) (Attachment 2), reached a decision that no further NEPA review was required per FAA Order 1050.1E. The project is categorically excluded per:

FAA Order 1050.1E, paragraph 310h - Federal financial assistance, licensing, or ALP approval for construction or expansion of facilities, such as terminal passenger handling and parking facilities or cargo buildings, at existing airports and launch facilities that do not substantially expand those facilities.

Below is supplemental information to fulfil SEPA requirements.

A. BACKGROUND

1. **Name of proposed project, if applicable:**

   International Arrivals Facility (IAF)

2. **Name of applicant:**

   Port of Seattle

3. **Address and phone number of applicant and contact person:**

   Port of Seattle
   P.O. Box 68727
   Seattle, WA 98168

   Contact: Steve Rybolt, Environmental Management Specialist II
   Telephone/Email: (206) 787-5527, Rybolt.S@portseattle.org

4. **Date checklist prepared:** May 5, 2015

5. **Agency requesting checklist:** Port or Seattle – SEPA File Number 15-04

6. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

   Yes. Sea-Tac International Airport is undergoing a major planning effort – The Sustainable Airport Master Plan (SAMP). The SAMP aims to meet the needs of the airport's customers by forecasting future demand and the projects required to meet that demand, with a strong emphasis on sustainability. Focus areas of the SAMP include airfield enhancements within the current three-runway configuration, terminal development and potential expansion (i.e. international and domestic), roadway improvements and cargo facility modernization. As international traffic continues to grow, future growth can be accommodated in the proposed IAF Federal Inspection Services facility with the addition of new baggage carousels, screening booths, and automated passport control kiosks. However, the SAMP

(anticipated completion in 2016), may provide project level and programmatic direction to meet future airport growth requirements that may be related to or connected to the proposed IAF project. Environmental review will be conducted for all future projects.

7. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- Programming and Planning Analysis. Seattle-Tacoma International Airport International Arrivals Facility (LeighFisher, 2013).
- Limited "Good Faith" Asbestos Containing Materials Survey South Terminal Expansion Project (STEP) – Completion Survey. Seattle-Tacoma International Airport. SeaTac, Washington (Argus Pacific, 2006).
- Regulated Buildings Materials Assessment Report. South Satellite (Argus Pacific, 2013).
- General Conformity Applicability Analysis. Proposed International Arrivals Facility at Seattle-Tacoma International Airport (Synergy Consulting, Inc., 2015)
- Endangered Species Review: Sea-Tac International Airport (Anchor QEA, LLC, 2014).
- Northwest Airlines Former Hangar. Summary of Post Construction Residual Soil Data (Lovely Consulting, 2008).
- International Arrivals Facility Baseline Environmental Investigation. Seattle-Tacoma International Airport. SeaTac, Washington (Landau Associates, 2014).

8. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

- Port of Seattle staff will seek Port of Seattle Commission authorization to select a Design-Build contractor at a publically held meeting in June or July of 2015;

9. List any government approvals or permits that will be needed for your proposal, if known.

The project underwent National Environmental Policy Act (NEPA) review. The Federal Aviation Administration (FAA) reviewed and granted a Documented Categorical Exclusion for this project on the April 22, 2015. See Appendix 2.

10. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project will be located at Seattle-Tacoma International Airport (Airport). The physical address is:

17801 Pacific Highway South
Seattle, WA 98158

Latitude: 47.448417
Longitude: -122.302099
Section 28, Township 23 North, Range 4 East

A map is available in Appendix 2.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other

b. What is the steepest slope on the site (approximate percent slope)?

The site is flat with the steepest slope being <1%.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The current site is paved. Underlying soil consists of pre-existing (Vashon till) or imported sand and gravel that was graded and compacted during original site use.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

The current site is paved with approximately 22,213 square feet of pervious surfaces. The proposed project would pave the existing pervious surfaces. There are no surface indications or history of unstable soil at the site.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Earthwork activities for the project will be limited to excavation for new footings, building foundations, STS basement level and elevator pits, and utility trenching. Excavation quantities are estimated to be 30,000 cubic yards of common excavation.

In addition, the airport expects to remove and replace approximately 7,500 square yards of existing pavement with minor changes to existing grades. The new pavement will be constructed on either re-compacted subgrade or on new grade for slope correction ranging from .5' to 1.5' feet in depth. There will be some areas with limited excavation as required to accommodate localized drainage. Any material source for the fill will be material from determined by contractor and is anticipated to be locally sourced.

The total affected area of the project is 12 acres.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Sea-Tac Airport is located in a maintenance area for carbon monoxide (CO); the project site is located in an attainment area for all other pollutants. Because of the maintenance status of the project area for CO a General Conformity applicability analysis was required and is provided in Attachment 2. The project is shown to be de minimis (below the thresholds for a CO maintenance area).

The project would use the Airport's existing central mechanical plant for heating and cooling and is regulated by the Puget Sound Clean Air Agency (NOC #7777) for air emissions.

Construction and demolition would result in short-term construction-related air emissions such as dust and vehicle exhaust.

See Appendix 1 for Greenhouse Gas Emissions Worksheet, Supplemental Information for SEPA Environmental Checklist.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

In general, there are no off-site sources of emissions that would affect this project.

3. Water

a. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known

Ground water will not be withdrawn or discharged to ground water for this project.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Waste materials will not be discharged into the ground from a septic system or other source.

b. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Stormwater on the site currently drains into the Airport's stormwater and industrial wastewater systems.

Stormwater on the site currently drains into the Airport's storm drain system and discharges, subject to an NPDES permit, into Des Moines Creek. Stormwater on site would be detained in existing stormwater ponds to the south of the property, and temporary Baker tanks.

Industrial stormwater is treated in the airport's Industrial Wastewater Treatment Plant. Once treated, the water is discharged to Puget Sound via Midway Sewer District outfall pipe or sent to King County's Renton Treatment Plant. All storm drain system and discharges are subject to the Airport's NPDES permit (#WA-002465-1).

The existing art sculpture, located at the proposed IAF project site, will be relocated. Stormwater management would be evaluated based on permanent location and the Washington State Department of Ecology's stormwater requirements.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Project design and construction management would prevent discharge of waste materials to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The proposed IAF may change the configuration of the existing industrial and stormwater conveyance systems. Modifications will be evaluated based on detention capacities and Washington State Department of Ecology's stormwater requirements.

The airport is proposing a rooftop rainwater collection system as part of the project. The rainwater will be collected in a storage tank and then used to supplement water for restroom use, i.e. grey water. This

water, once used, would be discharged to sanitary sewer – Midway Sewer District. Any excess water that exceeds the storage tank capacity would be routed to either the Airport's stormwater or industrial wastewater systems.

c. Proposed measures to reduce or control surface, ground, runoff water, and drainage pattern impacts, if any:

Water quality would be maintained by treatment under conditions of an approved Stormwater Pollution Prevention Plan (SWPPP).

4. Plants

a. Check the types of vegetation found on the site:

_____ deciduous tree: alder, maple, aspen, other

_____ evergreen tree: fir, cedar, pine, other

_____ shrubs

_____ grass

_____ pasture

_____ crop or grain

_____ orchards, vineyards or other permanent crops

_____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other

_____ water plants: water lily, eelgrass, milfoil, other

_____ other types of vegetation

b. List all noxious weeds and invasive species known to be on or near the site.

There are no known noxious weeds or invasive species at or near the project site.

5. Animals

a. List any birds and animals which have been observed on or near the site or are known to be on or near the site. Examples include:

Birds: hawk, heron, eagle, songbirds, other: starlings, crows, gulls, pigeons

Mammals: deer, bear, elk, beaver, other: rodents

Fish: bass, salmon, trout, herring, shellfish, other:

b. Proposed measures to preserve or enhance wildlife, if any:
No preservation or enhancement measures are proposed. The project is not expected to attract wildlife.

c. List any invasive animal species known to be on or near the site.

Pigeons and starlings are the only known invasive species known to be at the site.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

The IAF will use electricity and natural gas to serve electrical, baggage, and mechanical systems.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The project would not affect the potential use of solar energy by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The project will be seeking the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) certification. Under the program, the project would conserve energy by integrating a high performance mechanical system, enhanced thermal envelop, lighting power efficiencies, and maximize daylighting.

7. Environmental health

a. Describe special emergency services that might be required.

No special emergency services are expected as a result of implementing the project. Construction-related accidents or injuries may require response from local fire, police, air units, or ambulances. The Port maintains its own police force and firefighting and rescue units that would be called upon for these types of incidents. The Port also maintains a trained response team available to respond at all times to any spill or loss of contaminated or hazardous materials.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

In general, the dominant source of noise in the airport vicinity is generated by aircraft operations.

8. Land and shoreline use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The current use of the site is an airport terminal and ground transportation lot. Adjacent nearby land uses consist of active commercial runways and taxiways, an arterial roadway, commercial parking, and two hotels. The proposal will not affect current land use on nearby or adjacent properties.

b. Describe any structures on the site.

The existing SSAT building is approximately 87,000 square feet at concourse level and approximately 40 feet in height along perimeter and approximately 63 feet at height at the penthouses. Concourse A is approximately 186,000 square feet and approximately 40 feet in height. The IAF will be connected to the SSAT and Concourse A. Other nearby structures includes the Main Terminal, Concourse B, parking garage (i.e. located north), and the Delta Maintenance Hangar located to the south.

c. Will any structures be demolished? If so, what?

There will be a partial demolition of the existing South Satellite Terminal (internal and external materials) and Concourse A (internal and external materials) to accommodate the expansion and renovation.

d. What is the current zoning classification of the site?

The current land use is designated Airfield Operations (AVO). The land use designation will not change as a result of this project and there is no expected impact to nearby or adjacent land uses and properties.

e. What is the current comprehensive plan designation of the site?

The current land use is designated Airfield Operations (AVO).

f. Has any part of the site been classified as a critical area by the city or county? If so, specify.

The project site is not classified as an "environmentally critical" area.

g. Approximately how many people would reside or work in the completed project?

The IAF project will increase the number of individuals working at the airport to support the function of the IAF (i.e. Federal Inspection Services). This will increase from approximately 190 (80 Customs and Border Patrol [CBP] and other federal agencies, 60 airline staff workers, and 50 Port of Seattle staff and contractors) existing individuals workers to approximately 210 (90 CBP and federal agencies, 90 airline staff and contractors, and 30 Port of Seattle staff and contractors) workers once the project is complete.

h. Approximately how many people would the completed project displace?

There will be no displacement impacts expected as a result of this project.

i. Proposed measures to avoid or reduce displacement impacts, if any:

There will be no persons displaced as a result of this project.

j. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

No measures are proposed because there will be no changes to existing or projected land use as a result of this project.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

There will be no housing units provided by this project.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

There will be no housing units eliminated by this project.

c. Proposed measures to reduce or control housing impacts, if any:

There will be no housing impacts as a result of this project. Therefore, measures to reduce or control housing impacts are not proposed.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The tallest height of a structure at IAF would be approximately and no higher than 150 feet. This is the height of the bridge. The highest point of the FIS facility will be approximately 65 feet. The bridge and building exterior would consist of metal panels and glass, similar to the existing Concourse A.

b. What views in the immediate vicinity would be altered or obstructed?

No views in the immediate vicinity would be altered or obstructed.

c. Proposed measures to reduce or control aesthetic impacts, if any:

No measures are proposed because no aesthetic impacts are expected from this project.

11. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The IAF will be located west of Air Cargo Road and International Boulevard (State Route 99) between South 182nd and 188th Streets. Vehicles would access the IAF on Air Cargo Road from the south or

through an airport-only service tunnel from the north.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The project site is not specifically served by public transportation, but the airport is served by public transportation. The nearest public transportation site is located near the Airport Expressway (i.e. Link Light Rail and King County Metro), a quarter mile to the northeast.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

There will be no additional parking spaces created or eliminated by this project.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The proposal will not require any new or improvements to existing roads, streets, pedestrian, bicycle, or state transportation facilities.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project is located in the vicinity of Seattle-Tacoma International Airport. The project will not require the use of water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and non-passenger vehicles). What data or transportation models were used to make these estimates?

There will be no additional vehicular trips generated as a result the completed project.

Construction would result in a temporary increase in traffic volumes due to workers traveling to/from the site and haul trucks removing debris and transporting soil cuttings and fill. Assuming a capacity of 20 cubic yards per truck for excavation and pavement and 15 cubic yards per truck for building materials, the following is an estimate of potential truck trips that would occur over the four year construction period:

- 30,000 cubic yards of common excavation = approximately 1,500 round-trip truck trips
- 7,500 square yards of existing pavement (6" deep) = approx. 60 round-trip truck trips
- Demolished SSAT and Concourse A building materials = approx. 100 round-trip truck trips
- New IAF building materials = approx. 2,500 round-trip truck trips
- Approximately 60 trucks for new asphalt pavement for the South Ground Transportation lot.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The project will not interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area.

12. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The project will not require an increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

There is not expected to be any direct impacts on public services.

13. Utilities

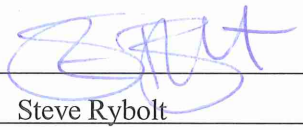
a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other: industrial water system, fire protection

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

There project will utilize existing utilities at the site.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 

Name of signee: Steve Rybolt

Position /Organization: Environmental Management Specialist II/Port of Seattle

Date Submitted: May 5, 2015

APPENDIX 1

Greenhouse Gas Emissions Worksheet
Supplemental Information for SEPA Environmental Checklist

GHG Emission Sources (CO2, CH4, N2O, HFCs, PFCs, SF6)[1]	**What sources are likely from the proposal?** ***List specific type of activities, and duration of emissions***	**What is the quantitative or qualitative assessment of those emissions?**	**What available mitigation will avoid or reduce those emissions?**
On-Road Mobile Sources	Not Applicable	Not Applicable	
Non-Road Mobile Sources	Not Applicable	Not Applicable	
Stationary Combustion	Facility conditioning (i.e. heating and cooling) will be required for the IAF. The IAF will use the airport's existing central mechanical plant, i.e. natural gas boiler.	Annual CO2 emissions will be approximately 1,582.83 tonnes CO2e	The IAF will investigate the integration of a high performance mechanical system, enhanced thermal envelope, and automated controls to minimize and efficiently condition the facility.
Industrial Processes	Not Applicable	Not Applicable	
Fugitive Emissions	Not Applicable	Not Applicable	
Agricultural Emissions	Not Applicable	Not Applicable	
Land Disturbance	Not Applicable	Not Applicable	
Purchased Electricity and Steam	Facility conditioning (i.e. heating and cooling), lighting, baggage systems, and mechanical walkways (i.e. escalators/elevators) will be required for the IAF. The IAF will use the airport's existing central mechanical plant, i.e. chiller.	Annual CO2 emissions will be approximately 1,745.34 tonnes CO2e	The IAF will investigate the integration of a high performance mechanical system, enhanced thermal envelope, and automated controls to minimize facility conditioning. Other energy conservation measures that will be investigated include lighting power efficiencies, and variable frequency drives for the baggage system and mechanical walkways to minimize energy use.
Construction	The project is slated to begin construction in second quarter 2016 with the facility complete in 2018 and operational in 2019.	Temporary construction related emissions are not expected to be significant (See Appendix 2).	Contractor performing construction/demolition would be required to maintain and repair all equipment in a manner that reasonably minimizes emissions.

GHG Emission Sources (CO2, CH4, N2O, HFCs, PFCs, SF6)[1]	**What sources are likely from the proposal?** ***List specific type of activities, and duration of emissions***	**What is the quantitative or qualitative assessment of those emissions?**	**What available mitigation will avoid or reduce those emissions?**
Extraction of Purchased Materials	Not Applicable	Not Applicable	
Processing of Purchased Materials	Not Applicable	Not Applicable	
Transportation of Purchased Materials	Not Applicable	Not Applicable	
Employee Commute	There may be up to 20 new concession employees upon project completion	The total lifespan transportation related GHG emissions equals ~6,170 MTCO2e/ per unit.*	Public transportation is available near the project site as an alternative to single occupancy vehicles.
Other Mobile Emissions	Not Applicable	Not Applicable	
Water Use and Wastewater Disposal	Not Applicable	Not Applicable	
Waste Management	Not Applicable	Not Applicable	
Product Use	Not Applicable	Not Applicable	

**Calculated via City of Seattle Department of Planning and Development SEPA GHG Emissions Worksheet.*

CH_4	Methane	Landfills, production and distribution of natural gas & petroleum, fermentation from the digestive system of livestock, rice cultivation, fossil fuel combustion, etc.
N_2O	Nitrous Oxide	Fossil fuel combustion, fertilizers, nylon production, manure, etc.
HFC's	Hydrofluorocarbons	Refrigeration gases, aluminum smelting, semiconductor manufacturing, etc.
PFC's	Perfluorocarbons	Aluminum production, semiconductor industry, etc.
SF_6	Sulfur Hexafluoride	Electrical transmissions and distribution systems, circuit breakers, magnesium production, etc.

APPENDIX 2

National Environmental Policy Act (NEPA)
International Arrivals Facility (IAF)

APPENDIX A. DOCUMENTED CATEX

Airport sponsors should use this form for projects eligible for a categorical exclusion (CATEX) that have greater potential for extraordinary circumstances or that otherwise require additional documentation, as described in the Environmental Orders (FAA Order 1050.1E and FAA Order 5050.4B).

To request a CATEX determination from the FAA, the sponsor should review potentially affected environmental resources, review the requirements of the applicable special purpose laws, and consult with the FAA Environmental Protection Specialist about the type of information needed. Complete this form and send it with any supporting environmental resource documentation to the appropriate FAA Airports Division/District Office. The form and supporting documentation should be provided in accordance with the provisions of FAA Order 5050.4B, paragraph 302b, to allow sufficient time for review. The CATEX cannot be approved until all information/documentation is received and all requirements have been fulfilled.

It is ultimately the sponsor's responsibility to ensure that all of the information necessary for the FAA to make an environmental determination is accurate and complete.

Name of Airport, LOC ID, and Location

Seattle-Tacoma International Airport - SEA - Seattle, Washington

Project Title

International Arrivals Facility (IAF)

Provide a brief, but complete description of the proposed project, including all project components, justification, estimated start date, and duration of the project. Include connected actions necessary to implement the proposed project (including but not limited to moving NAVAIDs, changing flight procedures, and designating or developing haul routes, new material or expanded material sources, staging or disposal areas). Attach a sketch or plan of the proposed project. Photos can also be helpful.

Seattle-Tacoma International Airport consists of a main terminal facility (referred to as the Central Terminal and includes four Concourses A-D) and two free standing terminal facilities on the ramp immediately to the north and south of the main terminal (referred to as the South Satellite (SSAT) and North Satellite (NSAT)). Both satellite facilities are currently served by respectively dedicated underground train systems providing connection between all three facilities.

The international arrivals facilities at Seattle-Tacoma International Airport are located in the SSAT. These facilites, originally constructed in 1973, have reached capacity and need to be expanded or replaced. A study in 2013, looking at various alternatives, recommended a new international arrivals facility serving the existing SSAT gates coupled with the continued and expanded use of existing gates on Concourse A for international departures. Any domestic operations that would be displaced by the increased international departure use of Concourse A would be adsorbed within the existing gates. No new gates would be constructed on Concourse A for this project.

The Port of Seattle, Seattle-Tacoma International Airport, is proposing the construction of a new landside facility - the International Arrivals Facility (IAF) The IAF will consist of three primary building components: a bridge connecting the existing SSAT to the A Concourse, a sterile corridor and vertical circulation cores on Concourse A, and a new IAF/Federal Inspection Services (FIS)

facility. The IAF would be located adjacent and connected to Concourse A and have a footprint of ~181,000 square feet or ~360,000 gross square feet. The IAF would house multiple Department of Homeland Security agency facilities and facilitate the movement of international passengers. The proposed project would not expand overall airport capacity, create new gates, or change the existing aircraft fleet mix, and there would be no new access to airport roadways as a result of this project. The proposed project would include the following elements:

• Construction of a new IAF/FIS facility east of and connected to Concourse A;

• Construction of an elevated sterile corridor and vertical circulation core west of and connected above Concourse A;

• Construction of an elevated pedestrian bridge from the SSAT to the Concourse A sterile corridor;

• Modification of existing aircraft parking layout (i.e. no new gates) at Concourse A (4 to 8 widebody positions) and SSAT (10 to 12 widebody positions) to accommodate widebody aircraft;

• Temporary relocation of the South Ground Transportation Lot during construction; and

• Pursuit of United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) certification for the facility.

The project is slated to begin construction in second quarter 2016 with the facility complete in 2018 and operational in 2019.

EXISTING CONDITIONS/PROJECT JUSTIFICATION:

The current SSAT (where international arrivals occur and international passenger processing services are located, i.e. FIS /Customs and Border Protection [CBP]) has 14 existing gates (11 of which can accept a wide body aircraft). These gates are primarily used for arriving international flights. In situations where aircraft gates are not available, up to 3 arriving planes can hardstand at Cargo 7 and passengers are bused to the SSAT. Additionally, departing planes that do not require international flight clearance services (i.e. customs) for passengers in the United States (i.e. international flight clearance services are required for passengers at their destination airport) can be towed to Concourse A (i.e. gates A-6 through A-14) once arriving international passengers disembark the plane and clear United States customs at the SSAT. This allows for more open gates at the SSAT for arriving international flights.

In 2014, arriving international flights required 685 planes to hold at or near a gate at the SSAT, with engines idling, for approximately 245 cumulative hours prior to deplaning passengers. In 2015, the airport will minimize planes waiting at or near a gate by busing passengers from nearby Cargo 7 hardstand (with a capacity for up to three aircraft) to the SSAT. It is probable that up to 14 flights per week would use hardstand bussing operations. The airport has purchased three buses for this activity. The busing would not be required following the construction of the proposed IAF project.

The proposed IAF projects bridge and sterile corridor would allow existing gates on Concoure A to be made available for arriving (and departing) international flights that require FIS. This would mitigate the need for hardstand/bussing operations and holding planes at or near gates with idling engines prior to deplaning passengers. The IAF projects FIS facility would allow a more efficient movement of passengers.

This project would not change the current aircraft fleet mix or add additional capacity to the airport. The proposed project would not induce activity.

Attachment A - Airport layout and proposed IAF location

Attachment B - Terminal layout and proposed IAF location

Provide a brief, but complete, description of the proposed project area. Include any unique or natural features within or surrounding the airport property.

The IAF would be located adjacent and connected to Concourse A. The IAF would be located east of Concourse A, an elevated sterile corridor and vertical circulation core located west and above gates on Concourse A, and a bridge connecting the SSAT to the IAF sterile corridor.

Attachment A - Airport layout and proposed IAF location

Attachment B - Terminal layout and proposed IAF location

Attachment C - Proposed picture of IAF

The IAF would be constructed on currently developed land on airport-owned property. There are no known natural resources (i.e. streams, wetlands, etc.) on or within the immediate vacinity of the site. The proposed project does not require other planned actions, such as the rehabilitation of the existing runways or projects being considered in the Master Plan that is currently underway.

Identify the appropriate CATEX paragraph(s) from Order 1050.1E (paragraph 307-312) or 5050.4B (tables 6-1 and 6-2) that apply to the project. Describe if the project differs in any way from the specific language of the CATEX or examples given as described in the Order.

1050.1E, paragraph 310h - "Federal financial assistance, licensing, or ALP approval for construction or expansion of facilities, such as terminal passenger handling and parking facilities or cargo buildings, at existing airports and launch facilities that do not substantially expand those facilities."

The proposed IAF does not intend to change the capacity of the airport, change the current aircraft fleet mix, or add any additional gates. The project will meet the airport's existing demand on currently developed land on airport-owned property. The additional 360,000 gross square feet of passenger processing space added by the proposed project, when considered in the context of the total 3,170,615 gross square feet of terminal and concourse space currently available at Sea-Tac Airport represents an ~11% change.

The circumstances one must consider when documenting a CATEX are listed below along with each of the impact categories related to the circumstance. Use FAA Environmental Orders 1050.1E, 5050.4B, and the Desk Reference for Airports Actions, as well as other guidance documents to assist you in determining what information needs to be provided about these resource topics to address potential impacts. Indicate whether or not there would be any effects under the particular resource topic and, **if needed**, cite available references to support these conclusions. Additional analyses and inventories can be attached or cited as needed.

304a. National Historic Preservation Act (NHPA) resources

Projects that have the potential to cause effects on historic properties require a Section 106 finding in order to meet the requirements of the NHPA regardless of the type of NEPA document being completed. Check with your local Airports Division/District Office to determine if a Section 106 finding is required. Consultation with the State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO) may be required, and should be conducted through the FAA.

	YES	NO
Are there historic/cultural resources listed (or eligible for listing) on the National Register of Historic Places located in the Area of Potential Effect? If yes, provide a record of the historic and/or cultural resources located therein. The SSAT was originally constructed in 1971 and 1973. Concourse A and the South Terminal Expansion Project (i.e. south expansion of Concourse A) was renovated/constructed in 2005. The site is currently developed and is not known to contain historic, architectural, archaeological, or cultural resources based upon extensive past Port and FAA studies. There is no change in current use of site. Review of the following studies identified no known historical, architectural, and/or cultural resource that were determined eligible to affect historic properties. - Washington Information System for Architectual and Archeological Records Data (WISAARD) does not indicate any historic, architectural, archeological, or cultural sites. - Final Environmental Impact Statement for the Proposed Master Plan Update Development Actions, Seattle-Tacoma International Airport (FAA and Port of Seattle, 1996) - Final Supplemental Environmental Impact Statement for the Proposed Master Plan Update Development Actions, Seattle-Tacoma International Airport (FAA and Port of Seattle, 1997) - Final Sea-Tac International Airport Comprehensive Development Plan, Sea-Tac International Airport (FAA and Port of Seattle, 2007) - Comprehensive Development Plan, Seattle-Tacoma International Airport (Port of Seattle, 2007)	☐	☒
Does the project have the potential to cause effects? If yes, describe the nature and extent of the effects. As noted in the studies above.	☐	☒

	YES	NO
Is the project area previously undisturbed? If yes, provide more information. The proposed IAF would be located on currently disturbed-developed land on airport-owned property. The site proposed for the IAF is currently a ground transportation lot, an art sculpture, and a load dock. The ground transportation lot would be temporarily displaced during construction, the art sculpture would be relocated, and the load dock would be temporarily taken out of service. The site proposed for the sterile corridor and bridge are currently airfield ramp areas. The proposed IAF bridge would allow aircraft flow underneath and the sterile corridor would be located east and above gates on Concourse A.	☐	☒
Will the project impact tribal land or land of interest to tribes? If yes, describe the nature and extent of the effects and provide information on the tribe affected. Consultation with their THPO may be required. The project would be located on currently developed land on airport-owned property. The project is not located on tribal land or land of interest to tribes based upon past coordination in the previously referrenced documents.	☐	☒

304b. Department of Transportation Act Section 4(f) and 6(f) resources

	YES	NO
Are there any properties protected under Section 4(f) (as defined by FAA Order 1050.1E) in or near the project area? This includes publicly owned parks, recreation areas, and wildlife or waterfowl refuges of national, state or local significance or land from a historic site of national, state or local significance. The proposed project would be located on currently developed land on airport-owned property. The property is currently used for aviation operations and does not contain publically owned parks, recreational areas, or wildlife or waterfowl refuges or national, state or local significance or land from a historic site of nation, state or local significance. The sculpture located at the site would be relocated to another port-owned property.	☐	☒
Will project construction or operation directly or constructively "use" any Section 4(f) resource? If yes, describe the nature and extent of the use and/or impacts, and why there are no prudent and feasible alternatives. See Desk Reference Chapter 7. The proposed project would be located on currently developed land on airport-owned property. The project construction or operation directly or constructively would not "use" or contain any Section 4(f) resources.	☐	☒
Will the project affect any recreational or park land purchased with Section 6(f) Land and Water Conservation Funds? If so, please explain, if there will be impacts to those properties. The proposed project would be located on currently developed land on airport-owned property. The project site does not contain any recreational or park land purchaed with Section 6(f) Land and Water Conservation Funds.	☐	☒

304c. Natural, Ecological, or Scenic Resources

This section covers a broad range of categories from farmlands to endangered species to coastal resources to wild and scenic rivers. Items to consider include:

Coastal Resources	YES	NO

Coastal Resources	**YES**	**NO**
Will the project occur in or impact a coastal zone as defined by the State's Coastal Zone Management Plan (CZMP)? If yes, discuss the project's consistency with the State's CZMP. Attach the consistency determination if applicable. The project would not occur in or impact a coastal zone as defined by the State's Coastal Zone Management Plan (CZMP). The only water body under the juristiction of a local or natinal shoreline program in the immediate airport vicinity is Angle Lake. The proposed project will not affect Angle Lake.	☐	☒
Will the project occur in or impact the Coastal Barrier Resource System as defined by the US Fish and Wildlife Service? The project would not occur in or impact the Coastal Barrier Resource System as defined by the US Fish and Wildlife Service. There are no Coastal Barrier Resource Systems within the immediate airport vicinity identified by the US fish and Wildlife Service.	☐	☒

Ecological Resources	**YES**	**NO**
Are there any federal or state listed endangered, threatened, or candidate species or designated critical habitat in or near the project area? This includes species protected by individual statute, such as the Bald Eagle. A biological assessment was prepared to evaluate impacts on threatened and endangered species and essential fish habitat associated with the Comprehensive Development Plan (2007) which encompasses the area assocated with this proposed project. That biological assessment found no signficant impact. Consultation was completed in accordance with Section 7(a)(2) of the ESA and its implementing regulations, 50 CFR Part 402, and Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act. Subsequently, on October 3, 2013, the Streaked Horned Lark (SHLA) was listed as a threatened species under the US Endangered Species Act. This listed subspecies is in documented decline in Washington State and is currently only found on a few large open grassland sites in Washington such as the Olympia Airport and Joint Base Lewis-McCord, coastal foredunes in southern Washington, and islands in the lower Columbia River. Between May and July of 2014, the Port conducted three presence and absence surveys. SHLAs were not detected at Seattle-Tacoma International Airport. In 2014, the airport conducted a programmatic review of the Endangered Species Act to inform airport operations and development planning. No new threatened and endangered species and essential fish habilitat were identified outside of what was identified within the Comprehensive Development Plan. Attachment D - Endangered Species Review: Sea-Tac International Airport	☐	☒
Does the project affect or have the potential to affect, directly or indirectly, any federal or state-listed, threatened, endangered or candidate species, or designated habitat? If yes, consultation between the FAA and the US Fish & Wildlife Service, National Marine Fisheries Service, and/or the appropriate state agency will be necessary. Provide a description of the impacts and how impacts will be avoided, minimized, or mitigated. The project would not anticipate to affect or have the potential to affect, directly, or indirectly, any federal or state-listed, threatened, endanged or candidate species, or designated habitat. The 2014 Endangered Species Review looked at the potential impact of the IAF and did not antipate any affects. The project, located on currently developed land, would use Best Management Practices (BMPs) for stormwater, construction erosion control, and construction noise. The site, although removes a small pervious area, is currently retrofitted for 100% stormwater detention and treatment.	☐	☒

Ecological Resources	**YES**	**NO**
Does the project have the potential to take birds protected by the Migratory Bird Treaty Act? Describe steps to avoid, minimize or mitigation impacts (such as timing windows determined in consultation with the USFWS). It is not anticipated that the project would have the potential to take birds protected by the Migratory Bird Treaty Act. The Migratory Bird Treaty Act (MBTA) makes it illegal to pursue, hunt, take, capture, kill, attempt to take, capture or kill any migratory bird or "any part, nest, or egg of any such bird…by any means or in any manner," except house sparrows, starlings, feral pigeons (rock doves), pheasant, quail, any domestic duck, geese, and other exotic birds. In the context of the MBTA, consideration must be given to the potential direct (albeit unintended) killing of protected birds. Such direct killing of birds is not expected to occur unless as an accidential strike with either existing aircraft operations, construction equipment, or vehicles entering the project area.	☐	☒
Does the project area contain resources protected by the Fish and Wildlife Coordination Act? If yes, describe any impacts and steps taken to avoid, minimize or mitigate impacts. The project area would not affect resources protected by the Fish and Wildlife Coordination Act. The project wouid be located on currently developed land on airport-owned property.	☐	☒
Does the project have the potential to impact fish habitat protected under the Magnuson-Stevens Act? If yes, after notifying the FAA and the airport sponsor will take the necessary consultation action. Actions may include preparing an Essential Fish Habitat assessment and consultation with the National Marine Fisheries Service. Describe any adverse impacts, and any conservation measures needed to avoid such impacts. A biological assessment was prepared to evaluate impacts on threatened and endangered species and essential fish habitat associated with the Comprehensive Development Plan which encompasses the area assocated with this project. That biological assessment found no signficant impact. Additionally, the project site is currently developed land on airport-owned property. Existing stormwater controls are in place and will be evaluated through the Department of Ecology's Stormwater Management Manual for Western Washington.	☐	☒

Farmland	**YES**	**NO**
Is there prime, unique, state or locally important farmland in/near the project area? Describe any significant impacts from the project. The project would not encompass any farmland.	☐	☒
Does the project include the acquisition and conversion of farmland? If farmland will be converted, describe coordination with the US Natural Resources Conservation and attach the completed Form AD-1006. The project would not acquire any land.	☐	☒

Floodplains	**YES**	**NO**
Will the project be located in, encroach upon or otherwise impact a floodplain? If yes, describe impacts and any agency coordination or public review completed including coordination with the local floodplain administrator. Attach the FEMA map if applicable and any documentation. There are no floodplains on the proposed project site.	☐	☒

Wetlands and Other Waters of the U.S.	**YES**	**NO**
Are there any wetlands or other waters of the U.S. in or near the project area? No streams, lakes, ponds, or wetlands occur on the project site; the project site is developed as noted previously.	☐	☒
Has wetland delineation been completed within the proposed project area? If yes, please provide U.S. Army Corps of Engineers (USACE) correspondence and jurisdictional determination. No wetlands occur on the project site.	☐	☒
If a delineation was not completed, was a field check done to confirm the presence/absence of wetlands or other waters of the U.S.? If no to both, please explain what methods were used to determine the presence/absence of wetlands. No streams, lakes, ponds, or wetlands occur on the project site.	☒	☐
If yes, will the project result in impacts, directly or indirectly (including tree clearing)? Describe any steps taken to avoid, minimize or mitigate the impact. No streams, lakes, ponds, or wetlands occur on the project site.	☐	☒

Wetlands and Other Waters of the U.S.	**YES**	**NO**
Is a USACE Clean Water Act Section 404 permit required? If yes, does the project fall within the parameters of a general permit? If so, which general permit? Stormwater on the site currently drains into the Airport's storm drain system and discharges, subject to an NPDEPS permit (WA-002465-01), into Des Moines Creek. No streams, lakes, ponds or wetlands exist on the site. The existing NPDES permit includes this proposed project.	☒	☐

Wild and Scenic Rivers	**YES**	**NO**
Is there a river on the Nationwide Rivers Inventory, a designated river in the National System, or river under State jurisdiction (including study or eligible segments) near the project? There are no wild or scenic rivers within the airport area.	☐	☒
Will the project directly or indirectly affect the river or an area within ¼ mile of its ordinary high water mark? There are no wild or scenic rivers within the airport area.	☐	☒

304d. Disruption of an Established Community

	YES	**NO**
Will the project disrupt a community, planned development or be inconsistent with plans or goals of the community? The property for this proosed project is zoned Aviation Operations and would remain Aviation Operations. The project would be located on currently developed land on airport-owned property. Property west of the IAF are terminal facilites and airfield. Adjacent properties east of the IAF include a light rail line, vacant port-owned property, and a parking garage. It is not anticipated that the project would disrupt a community or planned development.	☐	☒
Are residents or businesses being relocated as part of the project? There are no residents or businesses at or near proposed project site.	☐	☒

Environmental Justice	**YES**	**NO**
Are there minority and/or low-income populations in/near the project area?	☐	☒

Environmental Justice	**YES**	**NO**
Will the project cause any disproportionately high and adverse impacts to minority and/or low-income populations? Attach census data if warranted. The project would not increase airport capacity, aircraft fleet mix, or additional gates. The project site is currently developed land, on airport-owned property. Adjacent properties do not include permanent residents or businesses. No disproportionately high or adverse environmental impacts to air, water, hazardous waste, and noise were identified.	☐	☒

304e. Surface Transportation

	YES	**NO**
Will the project cause a significant increase in surface traffic congestion or cause a degradation of level of service provided?	☐	☒
Will the project require a permanent road relocation or closure? If yes, describe the nature and extent of the relocation or closure and indicate if coordination with the agency responsible for the road and emergency services has occurred. The project would not change or expand the existing roadway configuration as additional traffic would not be induced by the project. The existing South Ground Transportation Lot would be temporarily moved to the North Ground Transportation Lot and relocated back to the South Ground Transportatin Lot upon project completion. Transportation to/from the North Ground Transportation Lot would use airport roadways, i.e. Air Cargo Road and Airport Expressway. This will remove ground transportation vehicles from primary surface streets. During the project validation period, the design team will assess whether and to what extent other existing facilities, ex. loading dock, maintenance facilities, will be temporarily relocated or compressed during construction. However, any needs would be accommodated in existing facilities.	☐	☒

304f. Noise

	YES	NO
Will the project result in an increase in aircraft operations, nighttime operations, or change aircraft fleet mix? The proposed project would not increase airport capacity, aircraft fleet mix, or additional gates and is consistent with current Noise Exposure Maps. The project would change the gate configuration at the SSAT and Concourse A. Modification of existing aircraft parking layout at Concourse A (4 to 8 widebody positions) and SSAT (10 to 12 widebody positions) would occur to accommodate widebody aircraft for international operations. Any domestic aircraft would be adsorbed within the existing gates.	☐	☒
Will the project cause a change in airfield configuration, runway use, or flight patterns - either during construction or after the project is implemented? The project would not change the airfield configuration, runway use, or flight patters. The taxilanes around the SSAT will be temporarily impacted during accommodate the construction of the bridge from the SSAT to Concourse A.	☐	☒
Does the forecast exceed 90,000 annual propeller operations, 700 annual jet operations or 10 daily helicopter operations or a combination of the above? If yes, a noise analysis may be required if the project would result in a change in operations. This project would not alter total airport capacity or change aircraft fleet mix.	☒	☐
Has a noise analysis been conducted, including but not limited to generated noise contours, a specific point analysis, area equivalent method analysis, or other screening method? If yes, provide that documentation.	☐	☒
Could the project have a significant impact (DNL 1.5 dB or greater increase) on noise levels over noise sensitive areas within the 65+ DNL noise contour? The Port of Seattle, Seattle-Tacoma International Airport, recently completed Part 150 Noise Compatibility Study in 2014. The proposed IAF would not increase total airport capacity or change aircraft fleet mix. The IAF was assumed within the existing Noise Exposure Maps and accounts for the aircraft that will be used at the SSAT and Concourse A. The proposed poroject wouild not change conditions that would affect noise contours, such as activity levels, fleet mix, runway use, day/night distribution, etc. Thus, project specific contours were not warranted.	☐	☒

304g. Air Quality

	YES	NO
Is the project located in a Clean Air Act non-attainment or maintenance area?	☒	☐
If yes, is it listed as exempt, presumed to conform, or will emissions (including construction emissions) from the project be below *de minimis* levels? (Provide the paragraph citation for the exemption or presumed to conform list below, if applicable.) Is the project accounted for in the State Implementation Plan or specifically exempted? Attach documentation. If exempt or "presumed to conform", skip the next two questions. Sea-Tac Airport is located in a maintenance area for carbon monoxide (CO); the project site is located in an attainment area for all other pollutants. Because of the maintenance status of the project area for CO a General Conformity applicability analysis was required and is provided in Attachment E. The project is shown to be de minimis (below the thresholds for a CO maintenance area).	☒	☐
Does the project have the potential to increase landside or airside capacity, including an increase of surface vehicles? This project would not increase total airport capacity, increase aircraft operations, or change aircraft fleet mix.	☐	☒
Could the project impact air quality or violate local, State, Tribal or Federal air quality standards under the Clean Air Act Amendment of 1990? The project would use the Airport's existing central mechanical plant for heating and cooling and is regulated by the Puget Sound Clean Air Agency (NOC #7777) for air emissions.	☐	☒
Does the airport have 180,000 general aviation and air taxi operations or 1.3 million enplanements annually? If yes, an air quality analysis may be required if the project would result in a change in operations. This project would not increase total airport capacity, induce operations, or change aircraft fleet mix.	☒	☐

304h. Water Quality

Airport projects may cause water quality impacts due to their proximity to waterways. Airport related water quality impacts can occur from both point and non-point (stormwater runoff) sources.

	YES	NO

	YES	NO
Are there water resources within or near the project area? These include groundwater, surface water (lakes, rivers, etc.), sole source aquifers, and public water supply. If yes, provide a description of the resource, including the location (distance from project site, etc.). There are no streams, lakes, ponds or wetlands on the site as the site is currently developed as noted previously.	☐	☒
Will the project impact any of the identified water resources? Describe any steps that will be taken to protect water resources during and after construction. Stormwater from the site currently drains into the airport's storm drainage system and discharges into Des Moines Creek and Puget Sound. These discharges are permitted by the Airport's NPDES permit (WA-002465-01) which reflects the proposed project.	☐	☒
Will the project increase the amount or rate of stormwater runoff? Describe any steps that will be taken to ensure it will not impact water quality. The project would increase the amount of hard surface (i.e. impervious) discharging to Des Moines Creek by 22,213 square feet. The new hard surface would be located at the current site of the art sculpture. The increased flow would be mitigated by an end of pipe flow control detention facility or rooftop water captured and used within the International Arrivals Facility as greywater for toilet and urinal flushing. Water quality impacts would be evaluated during project design and applicable best management practices will be installed and/or implemented as part of the Airport's Stormwater Pollution Prevention Plan, protection of aquatic species and habitat, and sustainability program.	☒	☐
Does the project have the potential to violate federal, state, tribal or local water quality standards established under the Clean Water and Safe Drinking Water Acts? During project design the construction stormwater best management practices (BMPs) would be evaluated and appropriate BMPs selected to comply with all water quality standards and regulations in accordance with the existintg NPDES Permit. Project design will also determine the appropriate non-construction stormwater BMPs.	☐	☒
Are any permits required? If yes, list the appropriate permits. The industrial and construction stormwater activities are covered under the airport's existing NPDES permit (WA-002465-01).	☒	☐

304i. Highly Controversial on Environmental Grounds

	YES	NO
Is the project highly controversial? The term "highly controversial" means a substantial dispute exists as to the size, nature, or effect of a proposed federal action. The effects of an action are considered highly controversial when reasonable disagreement exists over the project's risks of causing environmental harm. Mere opposition to a project is not sufficient to be considered highly controversial on environmental grounds. Opposition on environmental grounds by a federal, state, or local government agency or by a tribe or a substantial number of the persons affected by the action should be considered in determining whether or not reasonable disagreement exists regarding the effects of a proposed action. Based on the Port's extensive outreach, the project is not believed to be highly controversial. The IAF project has been reviewed by the elected Port of Seattle Commission. The project has also been communicated publically using a vareity of methods. The project would also follow the Inter Local Agreement between the City of SeaTac and the Port of Seattle related to project coordination and potential impacts. During all of these project reviews or communications, there have been no questions related to the project on environmental grounds.	☐	☒

304j. Inconsistent with Federal, State, Tribal or Local Law

	YES	NO
Will the project be inconsistent with plans, goals, policy, zoning, or local controls that have been adopted for the area in which the airport is located? The proposed project is consistent with current zoning requirements. The property is zoned Aviation Operations and will remain the same. The project would be located on currently developed land on airport-owned property.	☐	☒
Is the project incompatible with surrounding land uses? The project is consistent with current zoning requirements. The property is zoned Aviation Operations and will remain the same. The project would be located on currently developed land on airport-owned property.	☐	☒

304k. Lighting, Visual, Hazardous Materials, Construction Impacts, Etc.

Light Emissions and Visual Effects

Airport related lighting facilities and activities could affect surrounding light-sensitive areas such as homes, parks, recreation areas, etc. Visual affects deal broadly with the extent to which airport development contrasts with the existing environment/setting.

	YES	NO
Will the proposed project produce light emission impacts? The IAF would comply with FAA lighting requirements, Port of Seattle requirements, and requirements identified under the Interlocal Agreement between the City of SeaTac and the Port of Seattle. The bridge and sterile corridor, located west/airfield side, would comply with ramp lighting requirements for aircraft parking and service operations the same as the existing facilities. Light emissions from the interior span of bridge would be reviewed as the design team develops the design for the bridge and will meet all FAA and Port of Seattle lighting requirements. The FIS facility would be located on the east/landside of the A Concourse. The new facility is anticipated to be a multi-level structure with a connection to the SSAT to A Concourse connector bridge extending over the top of the existing A Concourse. The exterior finishes and glazing of the new facility would be similar to the existing A Concourse and, therefore, would not significantly increase existing light emission levels.	☐	☒
Will there be visual or aesthetic impacts as a result of the proposed project and/or have there been concerns expressed about visual/aesthetic impacts? The IAF would comply with FAA visual requirements, Port of Seattle requirements, and requirements identified under the Interlocal Agreement between the City of SeaTac and the Port of Seattle. The bridge and sterile corridor, located west/airfield side, would comply with ramp visual requirements for aircraft parking and service operations the same as the existing facilities. The FIS facility would be located on the east/landside of the A Concourse. The new facility is anticipated to be a multi-level structure with a connection to the SSAT to A Concourse connector bridge extending over the top of the existing A Concourse. The exterior finishes and glazing of the new facility would be similar to the existing A Concourse and, therefore, would not significantly increase existing visual or aethetic impacts.	☐	☒

Hazardous Materials

Federal, State, and local laws regulate hazardous materials use, storage, transport or disposal. Disrupting sites containing hazardous materials or contaminates may cause significant impacts to soil, surface water, groundwater, air quality, humans, wildlife, and the organisms using these resources. This category also includes solid waste and hazardous substances.

	YES	NO

	YES	NO
Does the project involve or affect hazardous materials? A Regulated Buildings Materials Assessment Report for the SSAT (Argus Pacific, 2013) was conducted on January 10, 2013 and for Concourse A (AMEC Earth & Environmental, Inc., 2006) on December 20, 2006. The assessment for SSAT identified asbestos-containing materials (>1%), paint containing lead, heavy metals including barium, chromium, and mercury, caulking containing polychlorinated biphenyls (PCBs), mercury-containing fluorescent light tubes and PCB-containing light ballasts, high-intensity discharge (HID) lamps, and mercury containing switches. The assessment for Concourse A did not identify asbestos- or hazardous-containing materials. Plans will be in place to handle contaminated soil if it is encountered during project construction and all pertinent local, state, and federal regulations will be followed.	☒	☐
Will construction take place in an area that contains or previously contained hazardous materials? A focused baseline environmental investigation (Landau Associates, 2014) was completed on July 2, 2014 to identify suspected contaminated soils. The investigation did not identify any contaminated soils within the proposed location of the FIS facility. Known and unknown contaminated soil may be encountered during the project around decommissioned and active jet fuel hydrant lines present in and around the project site. Plans will be in place to handle contaminated soil if it is encountered during project construction and all pertinent local, state, and federal regulations will be followed.	☒	☐
If the project involves land acquisition, is there a potential for this land to contain hazardous materials or contaminants? No new land will be aquired for this project.	☐	☒
Will the proposed project produce hazardous and/or solid waste either during construction or after? If yes, how will the additional waste be handled? Diesel fuel and gasoline will be used on site to power construction equipment such as cranes, excavators, dump trucks and power generators.	☒	☐

Construction

Construction may cause various environmental effects including, but not limited to, increases in dust, aircraft and heavy equipment emissions, stormwater runoff, spill/leaking petroleum, and noise.

	YES	NO
Will the project result in construction impacts, such as reducing local air quality, increase erosion, pollutant runoff, or noise, or disrupt local traffic patterns? If yes, describe measures to avoid and minimize construction impacts. Construction would occur during the daytime and may occur at night within the airport operating area (AOA). Construction impacts associated with air, erosion, pollutant runoff, noise, and traffic are not expected to be significant. Air quality - Construction and demolition would result in short-term construction-related air emissions such as dust and vehicle exhaust. The contractor performing construction/demolition would be required to maintain and repair all equipment in a manner that reasonably minimizes emissions. These construction emissions are captured in the General Conformity Applicability Analysis (See attachment E) Erosion - During construction a Temporary Erosion and Sediment Control (TESC) plan will be in place to prevent erosion. Pollutant runoff - Water quality would be maintained by treatment under conditions of an approved Stormwater Pollution Prevention Plan (SWPPP). Noise - There are no residences in the immediate vicinity of the construction site. Construction noise would not be significant because of the distance between the project and the nearest noise sensitive uses. Noise from construction activities would be required to use Best Management Practices (BMPs) and adhere to the City of SeaTac's noise ordinance Traffic - Localized surface traffic impacts will be minimal. Haul routes will use, when possible, existing airport-only ingress/egress routes on Air Cargo road, State Route 509, and State Route 518. Haul routes will also include the use of S 156th St and S 188th St and will be coordinated per the conditions of Interlocal Agreement with the City of SeaTac.	☐	☒

	YES	NO
Will the project create short term impacts? The South Ground Transportation Lot would be temporarily moved to the North Ground Transportation Lot and relocated back to the South Ground Transportatin Lot upon project completion. Transportation to/from the North Ground Transportation Lot would use airport roadways, i.e. Air Cargo Road and Airport Expressway. This would remove ground transportation vehicles off primary surface streets. During the project validation period, the design team will assess whether and to what extent other existing facilities, ex. loading dock, maintenance facilities, would be temporarily relocated or compressed during construction; however these activities would be relocated to existing airport facilities.	☒	☐
Will the project result in long term/permanent impacts? This project would meet current demand and not increase airport capacity, operations, or a change in aircraft fleet mix. Future demand and facilities for cargo, domestic, and international services will be analzyed within the Sustainable Airport Master Plan.	☐	☒

Energy Supply and Natural Resources	YES	NO
Will the project change energy requirements or use consumable natural resources? The project would include a new building, sterile corridor, and enclosed bridge that will require conditioning, i.e. heating and cooling. Conditioning of these spaces would use the airport's existing central mechanical to produce hot and cold air. Natural gas and electricity usage would increase beyond the airport's current use to accommodate the new facilites. It is expected that would increase electricity requirements by 3.7% and natural gas requirements by 3.9%. Additionally, the International Arrivals Facility is looking for opportunities to achieve the Port of Seattle's Century Agenda goal to "Meet all increased energy needs through conservation and renewable resources." The Port is expected to seek United States Green Building Council's Leadership in Energy and Environmental Design certification for the proposed project and minimize energy use through design and conservation practices as practicable. Because the project would increase electrical consumption, greenhouse gases will increase by 1,745.34 tonnes CO2e per year (i.e. 158.51 tonnes C02e electricty + 1,586.83 tonnes C02e natural gas). This information is based off the study, "Sustainability Discovery + Recommendations: Seattle-Tacoma International Airport" (LeighFisher, 2014).	☒	☐

Energy Supply and Natural Resources	**YES**	**NO**
Will the project change aircraft/vehicle traffic patterns that could alter fuel usage? No roadway or airfield changes would result from this project. Aircraft and vehicle traffic patterns would maintain existing conditions with the International Arrivals Facility.	☐	☒

Public Involvement

Through public participation, federal agencies disclose information about a proposed project and expected environmental effects. Many of the special purpose laws (National Historic Preservation Act, Clean Water Act, etc.) require public notice and the opportunity for public involvement.

	YES	**NO**

	YES	NO
Was there any public notification or involvement? If yes, provide documentation. The project has been documented/discussed in public forums. These include: - Employee & stakeholder newsletter ("Connections") (fall and winter 2014) This is newsletter is sent out to an electronic mailing list, and up to 3500 copies are mailed or hand delivered and used as a handout at meetings, tours, events and information packets. Available on the Port of Seattle website; - Airport brochure (January 2015) - 1000 copies printed for use as handouts at meetings, for tours, events and information packets. Available on the Port of Seattle website; - Airport Economic Impact publication (spring 2015) - 300 copies printed for use as handouts at meetings, for tours, events and information packets. Available on the Port of Seattle website; - Comprehensive Annual Financial Report (spring 2015) - 100 copies will be printed and mailed to rating agencies, state auditor, financial institutions and other stakeholders. Available on Port of Seattle website; Port of Seattle Commission briefings (19 public forums): February 2, 2010 - Briefing on SSAT passenger group and facility constraints; June 14, 2011 - International air service growth and future facility planning; June 26, 2012 - Briefing on air terminal development challenges; April 9, 2013 - Sea-Tac Airport IAF briefing; July 9, 2013 - Sea-Tac Airport IAF briefing; July 23, 2013 - IAF project and program support; November 19, 2013 - IAF construction management; February 25, 2014 - IAF program breifing; March 11, 2014 - IAF Master Planning authorization; April 22, 2014 - Capital Program/IAF briefing; May 6, 2014 - IAF delivery briefing; June 10, 2014 - IAF update and quarterly breifing; July 22, 2014 - IAF progress briefing; August 19, 2014 - IAF quarterly breifing; October 28, 2014 - IAF quarterly briefing; December 2, 2014 - IAF scope and budget update; January 13, 2015 - IAF update; and January 27, 2015 - IAF briefing. The IAF will also undergo environmental review under the Washington State's State Environmental Policy Act (SEPA) that includes a public outreach and comment component. Under recent revisions to SEPA, project sponsors can now adopt NEPA categorical exclusions for purposes of meeting SEPA. The Port anticipates using that approach that would likely result in a determination of non signfiicance. This would be completed if and when FAA approves a categorical exclusion.	☒	☐

Indirect/Secondary/Induced Impacts

Indirect/Secondary/Induced Impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. They may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

	YES	NO
Will the project result in indirect/secondary/induced impacts? International travel as Sea-Tac International Airport has been growing. In 2014 international passenger activity was 6.8% higher than in 2013. The Port anticipates higher international traffic demand whether or not the proposed project is completed. Thus, the project is needed to meet existing demand. However, the project would not increase total airport capacity, operations, or change aircraft fleet mix. The project is not expected to induce additional international activity.	☐	☒
When considered with other past, present, and reasonably foreseeable future projects, on or off airport property and regardless of funding source, would the proposed project result in a significant cumulative impact? IAF construction actitivities would overlap with the final construction phase of the 16C/34C runway rechabilitation project (i.e. taxiway reconfiguration) and the NSAT expansion project. The IAF project and NSAT projects are located on opposite ends of the airfield ramp area localizing impacts to those areas, i.e. construction staging, haul routes, and logistics areas. The runway rehabilitation construction activity is the only active airfield project occuring in 2016. Per the Interlocal Agreement (ILA) and other commitments, the Port is continuing to coordinate its construction activities with the local jurisdictions to ensure that cumulative impacts do not arise. These projects would also be located on airport properties, away from any potential community impacts. Based on the description, location and schedule for each of the projects, no significant cumulative impacts are anticipated with the respect to the above identified environmental categories. Considering the project with past, present, and a reasonably foreseeable future development projects on and off the airports, no significant cumulative impacts are anticipated.	☐	☒

Permits

List any permits required for the proposed project that have not been previously discussed. Provide details on the status of permits.

There are no new environmental permits that would be aquired for this project. The airports existing NPDES permit and Puget Sound Clean Air Agency permit covers the proposed project.

Environmental Commitments

List all measures and commitments made to avoid, minimize, mitigate, and compensate for impacts on the environment, which are needed for this project to qualify for a CATEX.

It is not anticipated that the project would have any significant environment impacts. The Port will be pursuing the United States Green Building Council's Leadership in Energy and Environmental Design (LEED) Silver certification for the facilities.

Preparer Information

Point of Contact: Steve Rybolt

Address: P.O. Box 68727

City: Seattle **State**: WA **ZIP code**: 98168

Phone Number: 206.787.5527 **Email Address**: Rybolt.S@portseattle.org

Signature: _____ Date: 4/22/2015_____

Airport Sponsor Information and Certification
(may not be delegated to consultant)

Provide contact information for the designated sponsor point of contact and any other individuals requiring notification of the FAA decision.

Point of Contact: Steve Rybolt

Address: P.O. Box 68727

City: Seattle **State**: WA **ZIP code**: 98168

Phone Number: 206.787.5527 **Email Address**: Rybolt.S@portseattle.org

Additional Name(s): Elizabeth Leavitt

Additional Email Address(es): Leavitt.E@portseattle.org

I certify that the information I have provided above is, to the best of my knowledge, correct. I also recognize and agree that no construction activity, including but not limited to site preparation, demolition, or land disturbance, shall proceed for the above proposed project(s) until FAA issues a final environmental decision for the proposed project(s) and until compliance with all other applicable FAA approval actions (e.g., ALP approval, airspace approval, grant approval) has occurred.

Signature: _____ Date: 4/22/2015_____

FAA Decision

Having reviewed the above information, certified by the responsible airport official, it is the FAA's decision that the proposed project (s) or development warrants environmental processing as indicated below.

- [x] No further NEPA review required. Project is categorically excluded per (cite applicable 10501.E CATEX that applies)
- [ ] An Environmental Assessment (EA) is required.
- [ ] An Environmental Impact Statement (EIS) is required.
- [ ] The following additional documentation is necessary for FAA to perform a complete environmental evaluation of the proposed project.

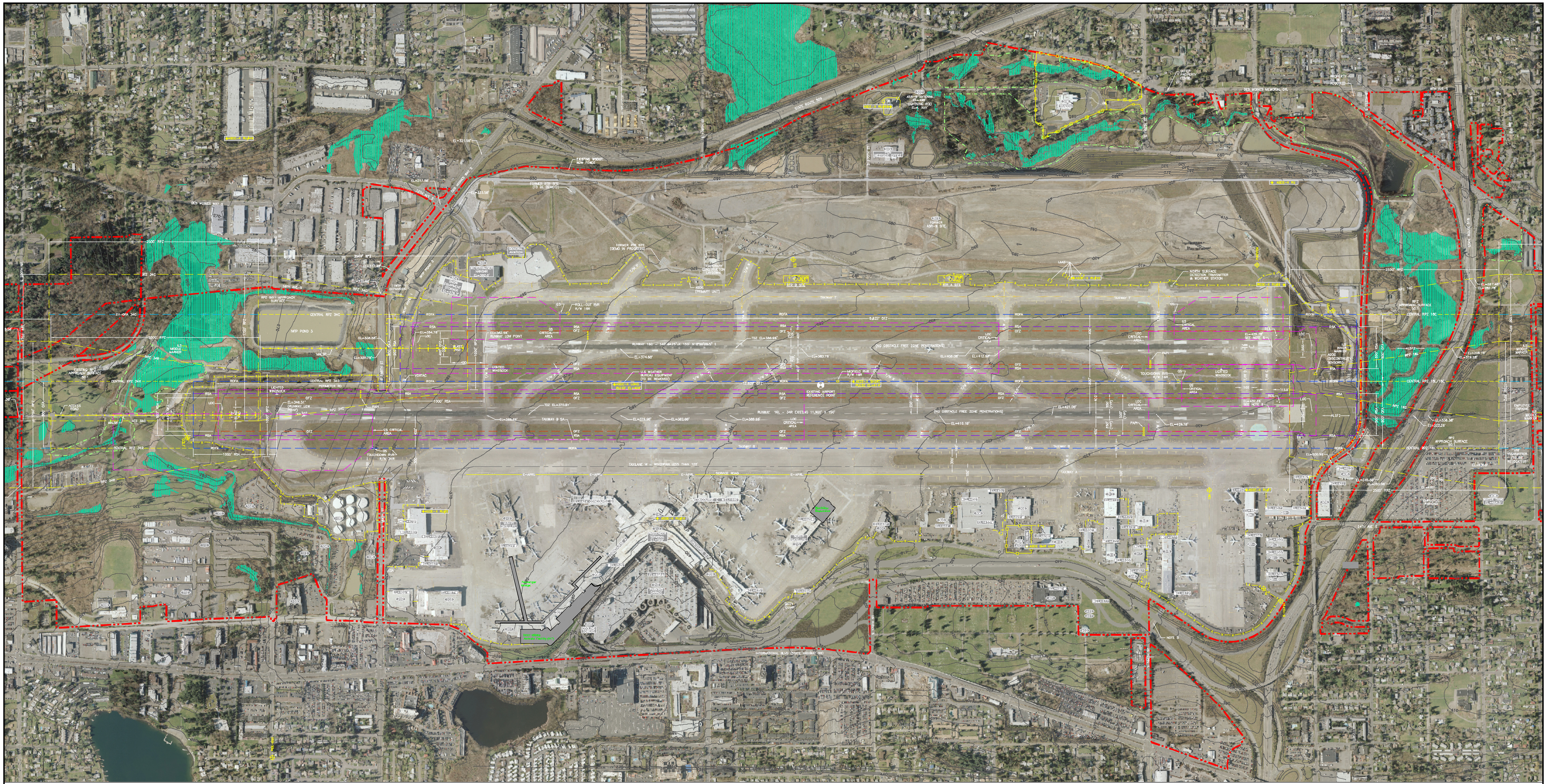
Name: Cayla D. Morgan Title: Environmental Protection Specialist

Responsible FAA Official

Signature: _____ Date: 4/22/15

ATTACHMENT A

AIRPORT LAYOUT PLAN AND PROPOSED INTERNATIONAL ARRIVALS FACILITY LOCATION



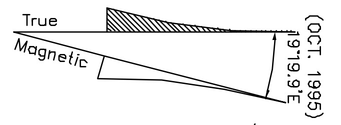
NO.	EXISTING	ELEV.
101	GOLF COURSE CLUB HOUSE	354' (EST.)
102	EMPLOYEE PARKING	SURFACE – 279' (EST.)
103	ALASKA AIRLINES FLIGHT CENTER	404' (EST.)
104	SOUTH REMOTE PARKING FACILITY	SURFACE – 304' (EST.)
105	FUEL STORAGE AREA	
106	ELECTRICAL SUBSTATION	
109	POS/US CUSTOMS MODULARS	444' (EST.)
110	CNG STATION	404' (EST.)
111	POS LAYDOWN/STORAGER/EMP. PARKING COMPLEX	364'–424' (EST.)
112	POS MAINTENANCE STORAGE	325' (EST.)
201	ALASKA AIRLINES MAINTENANCE	453'
202	NORTHWEST AIRLINES CARGO	406'
203	NORTHWEST AIRLINES MAINTENANCE	487'
205	COOLING TOWERS	< 454'
208	POS OFFICE TOWER	520'
209–1	CHARTER/CRUISE SHIP BUS LOTS – SOUTH	SURFACE
209–2	CHARTER/CRUISE SHIP BUS LOT – NORTH	SURFACE
210	PARKING GARAGE (8 FLOORS)	454'
212	SOUTH SATELLITE	439'
213	MAIN PASSENGER TERMINAL	466'
214	RAMP CONTROL TOWER	508'
215	NORTH SATELLITE	465'
301	AIRPORT RESCUE AND FIRE FIGHTING STATION	432'
305	DELTA AIR CARGO	444'
306	U.S. POSTAL MAIL FACILITY	465'
308	UNITED AIRLINES CARGO	470'
309	AIR TRAFFIC CONTROL TOWER (ATCT)	686'
310	ALASKA AIRLINES AIR CARGO	458'
311	AMB CARGO CENTER 1	460'
312	AIR CARGO 4	412'

EXISTING BUILDING DATA

NO.	EXISTING	ELEV.
313	IAC AEROGROUND	471'
314	EMERY AIR FREIGHT	465'
316	UNITED AIRLINES MAINTENANCE	470'
317	AMB CARGO CENTER 2	464'
318	PUMP HOUSE	457'
319	FEDERAL EXPRESS	478'
320–1	AMB/AFCO 1	463'
320–2	AMB/AFCO 2	457'
321–1	TRANSIPLEX AIR CARGO 1	466'
321–2	TRANSIPLEX AIR CARGO 2	455'
321–3	TRANSIPLEX AIR CARGO 3	456'
321–4	TRANSIPLEX AIR CARGO 4	456'
401	GATE GOURMET FLIGHT KITCHEN	482'
402	NOT USED	
403	WATER TOWER	522' (EST.)
404	LSG SKY CHEFS FLIGHT KITCHEN	421'
405	FLYING FOOD SERVICES FLIGHT KITCHEN	415'
407	POS OFFICES	460' (EST.)
408	WATER TANK	469'
501	WEYERHAEUSER CORPORATE HANGAR	439' (EST.)
502	ASR–9	498'
504	SNOW EQUIPMENT STORAGE	379'
505	POS WESTSIDE OFFICES	384' (EST.)
506	TRACON	294' (EST.)

LEGEND

	EXISTING
AIRFIELD ASPHALT PAVEMENT	SEE PHOTO
AIRFIELD CONCRETE PAVEMENT	SEE PHOTO
AIRCRAFT PARKING RESTRICTION LINE (APRL)	E–APRL
EXTENDED OFA	2X–OFA
FENCE–AOA	X X X
FENCE–FAA FACILITIES	
GROUND CONTOURS	600
GS AND LOC CRITICAL AREAS (GSCA – LOC)	
NPOS (Not Port of Seattle Property)	
OBJECT FREE ZONE	OFZ
POS (Port of Seattle Property)	
RESTRICTIVE COVENANTS	
ROAD/VEHICLE PARKING	SEE PHOTO
RUNWAY CENTERLINE	SEE PHOTO
RUNWAY SAFETY AREA (CENTRAL RSA)	RSA
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
RUNWAY CENTRAL PROTECTION ZONE (CENTRAL RPZ)	CENTAL RPZ
RUNWAY PROTECTION ZONE (RPZ)	RPZ
TAXIWAY / TAXILANE CENTERLINE	SEE PHOTO
AIRPORT REFERENCE POINT (ARP)	
BENCH MARK	
WETLANDS	



Annual Rate of Change: –7.75 min/year per NOAA

400 0 200 400 800 1600

SCALE IN FEET

NOTES:

1. EXISTING AERIAL TAKEN SPRING 2006 AND TOPOGRAPHY BASED ON AERIAL PHOTOGRAMMETRY FROM 2003.
2. ALL LATITUDES AND LONGITUDES GIVEN ARE IN DEGREES–MINUTES–SECONDS (NAD 83.) ALL ELEVATIONS GIVEN ARE IN FEET MSL (NAVD 88.)
3. BRIDGE OWNED BY PORT OF SEATTLE.
4. SEE OC582 DATED NOVEMBER 1993 FOR LOCATION OF OBSTRUCTION LIGHTS.
5. LOCALIZER WILL BE RELOCATED AT CONCLUSION OF RUNWAY SAFETY AREA WORK.
6. TAXIWAY W IS RESTRICTED TO AIRCRAFT WITH WINGSPAN OF 125' OR LESS.
7. THE BOUNDARIES AND USES WITHIN THE CENTRAL PORTION OF THE RPZ ARE DEFINED BY FAA ADVISORY CIRCULAR 150/5300–13 CHANGE 11, PARAGRAPH 212. PREVIOURS ALP'S ON FILE WITH THE FAA FOR SEATTLE–TACOMA INTERNATIONAL AIRPORT REFERRED TO THIS AREA AS THE X–OFA.
8. RUNWAY HIGH POINT, TOUCHDOWN ZONE, AND END ELEVATION.

THE PREPARATION OF THIS DOCUMENT DID NOT RECEIVE SUPPORT THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49, UNITED STATES CODE, SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. APPROVAL OF THE AIRPORT LAYOUT PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

Port of Seattle
SEA-TAC INTERNATIONAL AIRPORT

HNTB

REVISIONS

NO.	DATE	BY	DESCRIPTION	APP'D

POS APPROVAL	FAA APPROVAL
APPROVED BY (SIGNATURE)	APPROVED BY (SIGNATURE)
APPROVED BY (PRINTED)	APPROVED BY (PRINTED)
TITLE (PRINTED)	TITLE (PRINTED)
DATE	DATE

PROJECT MANAGER: DAVE C SMITH (POS)
PROJECT ENGINEER: JAMES E THOMSON (HNTB)
DRAFTER: NANCY G HATCHER (HNTB)
SCALE: 1" = 400'
DATE: DECEMBER 2007
CHECKED/APPROVED BY: POS STAFF

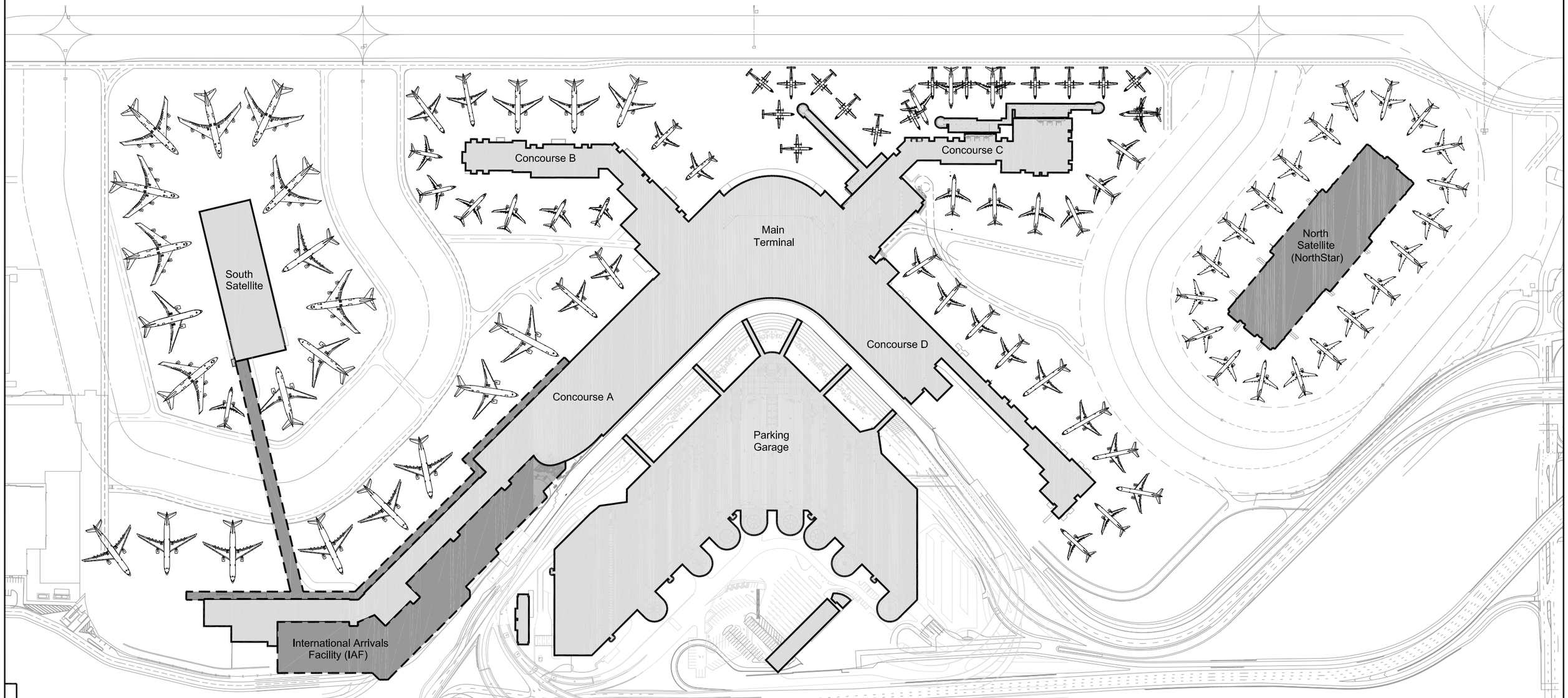
AIRPORT LAYOUT PLAN

EXISTING CONDITIONS WITH IAF AND NORTHSTAR

SHEET: 3.1 OF 18

ATTACHMENT B

TERMINAL LAYOUT AND PROPOSED INTERNATIONAL ARRIVALS FACILITY LOCATION



Terminal Development Plan

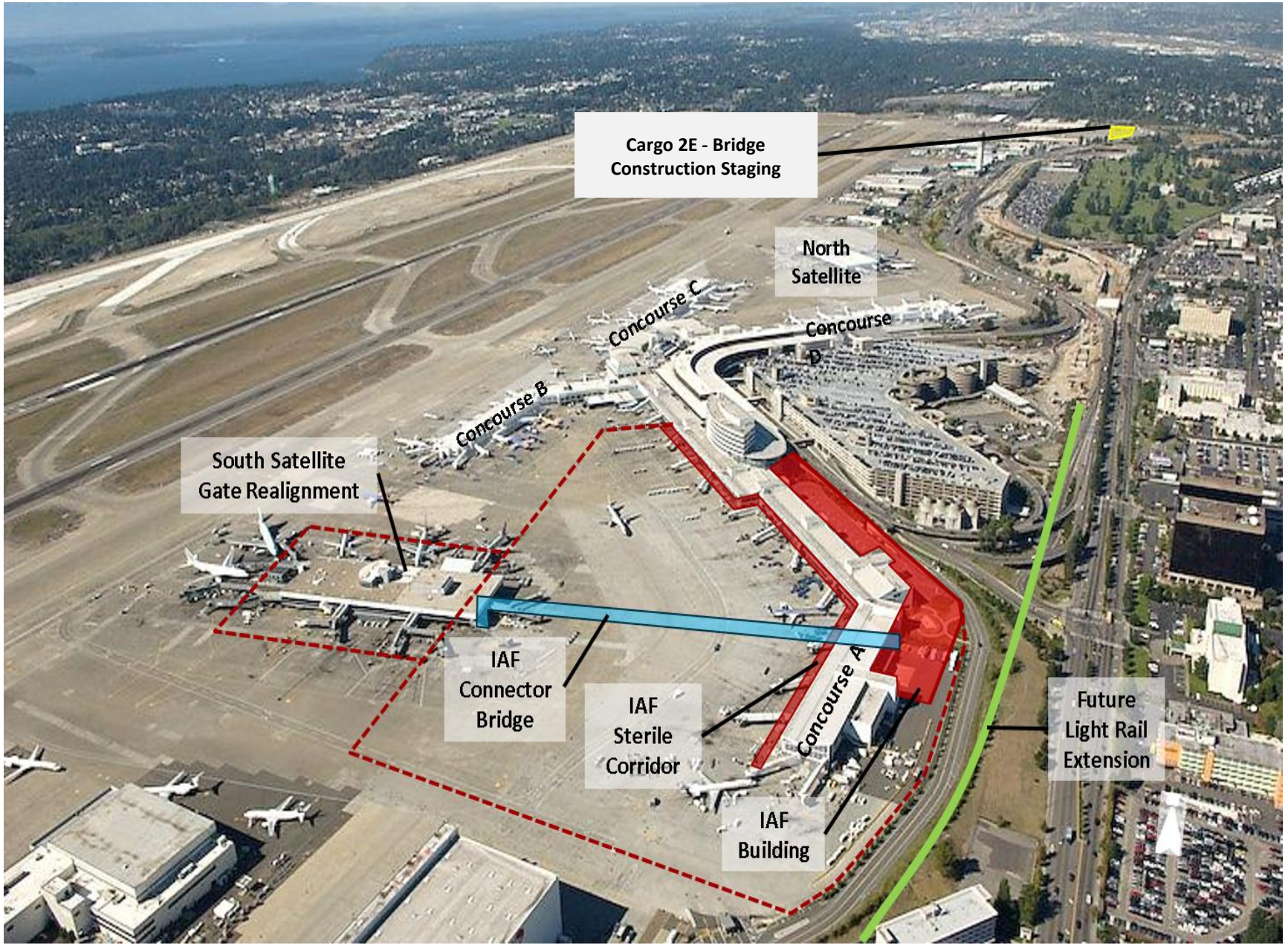
Port of Seattle/Aviation Planning
Seattle-Tacoma International Airport

PROJECT: Aviation Planning
DATE: 123/02/14
SHEET TITLE: Terminal Development Plan

SCALE: Not to Scale
SHEET NO.

ATTACHMENT C

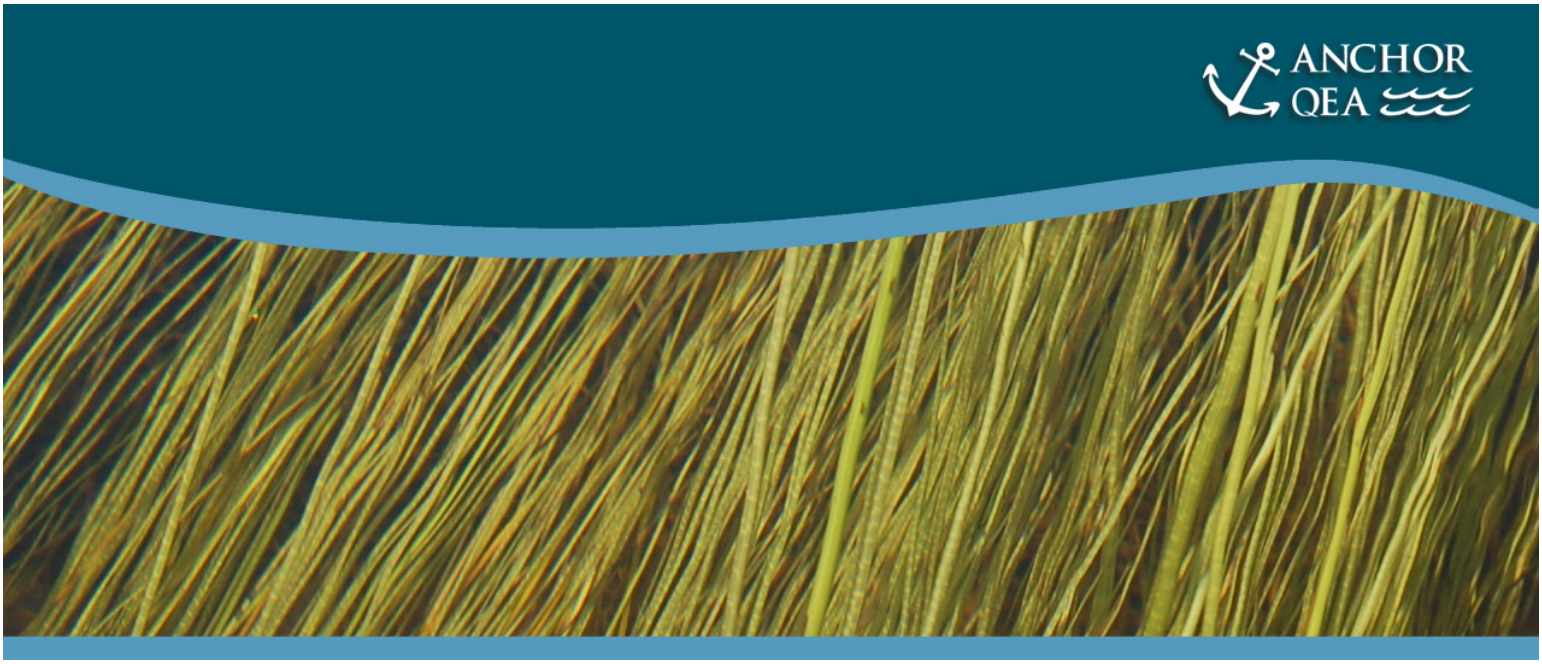
PROPOSED PICTURE OF INTERNATIONAL ARRIVALS FACILITY


Cargo 2E - Bridge Construction Staging
North Satellite
Concourse C
Concourse D
Concourse B
South Satellite Gate Realignment
IAF Connector Bridge
IAF Sterile Corridor
Concourse A
IAF Building
Future Light Rail Extension

ATTACHMENT D

ENDANGERED SPECIES REVIEW: SEA-TAC INTERNATIONAL AIRPORT

**without Appendix A – Species Information*



ENDANGERED SPECIES REVIEW: SEA-TAC INTERNATIONAL AIRPORT

Prepared for

Port of Seattle

Prepared by

Anchor QEA, LLC

October 2014

ENDANGERED SPECIES REVIEW: SEA-TAC INTERNATIONAL AIRPORT

Prepared for

Port of Seattle

Prepared by

Anchor QEA, LLC

720 Olive Way, Suite 1900

Seattle, Washington 98101

October 2014

TABLE OF CONTENTS

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LIST OF ACRONYMS AND ABBREVIATIONS

BA	Biological Assessment
BMP	best management practice
CDP	Comprehensive Development Plan
CWA	Clean Water Act
dBA	A-weighted decibels
DPS	distinct population segment
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FAA	Federal Aviation Administration
HCP	Habitat Conservation Plan
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
Port	Port of Seattle
SAMP	Sustainable Airport Master Plan
SR	State Route
STIA	Seattle-Tacoma International Airport
TMDL	Total Maximum Daily Load
TNW	traditionally navigable waters
USFWS	U.S. Fish and Wildlife Service
WSDOT	Washington State Department of Transportation

EXECUTIVE SUMMARY

This report provides the Port of Seattle (Port) with information on Endangered Species Act (ESA) listed species and the Port-owned lands in and around Seattle-Tacoma International Airport (STIA) that may potentially be occupied by ESA-listed species or provide critical habitat for ESA-listed species. Developing a knowledge base of where ESA-listed species may forage, nest, or travel relative to STIA and Port-owned properties is important information for several purposes as the Port considers ongoing operations and maintenance work, as well as future development. Further, this information may allow the Port to identify opportunities to support and enhance wildlife, ESA-listed species, and habitats for ESA-listed species, which can be incorporated into a future Sustainable Master Plan for STIA.

This report provides information on the current, candidate, and potential ESA-listed species in or around King County and Puget Sound and an evaluation of which of those species may be likely to occur on or near airport property. The evaluation indicated that *there are no currently listed or proposed species found within the upland portions of the Study Area established for the report*. The presence of ESA-listed salmonid species as well as larval and juvenile life stages of certain ESA-listed rockfish species in Puget Sound is presumed to occur due to known species habitat preferences, which creates a nexus for potential ESA effects from projects at STIA that may contribute stormwater runoff that reaches Puget Sound. While several terrestrial species are proposed for listing in western Washington, a review of species life history information and habitat preferences determined that in almost all cases it is expected that suitable habitat for these species is not present at STIA or the broader Study Area.

The ESA review considered current listings as of May 2014 as well as species presence surveys conducted for streaked horned lark in the summer of 2014. Due to the variable timing of ESA listings, the STIA and/or Port staff should initiate a review of the currently listed species at the onset of specific projects to identify applicable ESA-listed species that require ESA consultation.

1 INTRODUCTION

The purpose of this report is to provide the Port of Seattle (Port) with information on Endangered Species Act (ESA) listed species and the habitats they occupy for Port-owned lands near Seattle-Tacoma International Airport (STIA). This report has been designed to enable the Port to consider how potential impacts to ESA-listed species may affect future project and construction activities at STIA. For example, this document provides ESA compliance information to establish ESA baseline conditions for the upcoming Sustainable Airport Master Plan (SAMP). It has been designed to enable Port environmental managers to plan and prepare for upcoming environmental evaluations and ESA consultations related to Port operations and potential future development activities.

In addressing existing and future airport needs, the Port will continue to make improvements to airport operations and facilities on a regular basis. Projects with a federal nexus via federal approvals such as permitting, or funding, require the federal lead agency (e.g., Federal Aviation Administration [FAA]) to comply with ESA Section 7. Such Section 7 compliance is completed through consultation with National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), or both, and is a step in the process of obtaining relevant regulatory approvals. In addition, the Port will be developing a SAMP that will guide future development on Port properties for the next several decades. This report provides an overview of current, candidate, and potential ESA-listed species that may be likely to occur on or near airport property, and how those species may be affected by certain types of operational improvements or site development activities.

The existing airport facilities at STIA and surrounding Port-owned properties include a variety of developed areas and managed habitats, some of which may be used by ESA-listed species that are known to occur in King County and Western Washington. To assess the likelihood that ESA-listed species may be present and potentially affected by STIA projects and operations, the following methodology was used:

1. Establish a Study Area boundary (see Section 2); evaluate habitat types found within Study Area.

2. Review ESA listings, including current, candidate, and potential species, and determine which species will likely be addressed in future ESA compliance efforts at STIA based on species and habitat types present.
3. Review ongoing airport operations and potential activities on adjacent properties that would be likely to have impacts to species or habitat.
4. Document short- and long-term Port operational and development actions with components that have the potential to impact ESA-listed species, such as construction and operational noise, vegetation removal, erosion, and stormwater runoff.

This report was prepared to specifically address existing conditions within the Study Area and ESA listings at the time the report was developed. It was further developed using the following criteria:

1. The ESA review makes a reasonable assumption that there will be no substantial changes to airport operations relative to traffic volumes or types of aircraft.
2. The ESA review considered current listings as of May 2014. Due to the uncertainty of the timing of ESA listings, a review of the currently listed species should occur at the onset of specific projects to identify applicable ESA-listed species requiring ESA consultation.
3. This document is intended to inform STIA management and environmental staff on the current status of ESA listings as applicable to airport operations and anticipated Port projects within the Study Area; it is not a substitute for a Biological Assessment (BA) or other ESA compliance document.

2 STUDY AREA

For this ESA evaluation, the Study Area boundaries were shaped primarily by a 0.6-mile buffer around the outermost boundaries of the airport and adjacent Port-owned properties located to the north and south of the airport. This 0.6-mile buffer represents the limit of where noise from expected construction activities would reach background levels and provides the in-air extent of the Study Area (WSDOT 2014). Also included as part of the Study Area are the drainages of Des Moines Creek, Miller Creek, and Gilliam Creek from where they intersect or enter the Port's property to the mouths of each creek and their associated estuaries in Puget Sound, which make up the aquatic extent of the Study Area. Des Moines Creek and Miller Creek convey treated stormwater from the airport stormwater management ponds directly to Puget Sound, while Gilliam Creek discharges to the Green River. All of these creeks therefore create a pathway for airport operations to potentially affect species inhabiting nearshore aquatic habitats. The Study Area is shown on Figure 1, and includes land within the cities of SeaTac and Burien in King County, Washington.

The Study Area was established to provide a specific geographic area wherein impacts to listed species from airport operations and projects may occur and to identify the ESA-listed species and associated habitats that could occur within this area. The environmental baseline of STIA and Port-owned properties within the Study Area boundary has been extensively described and evaluated as part of recent environmental evaluations including, for example, the BA developed for the Master Plan Update Improvements at STIA (FAA 2001), the Des Moines Creek Business Park Environmental Impact Statement (POS 2006) and the BA developed for the Port's STIA Comprehensive Development Plan (CDP) in 2007 (Herrera 2007). The environmental baseline conditions throughout the rest of the Study Area are expected to be consistent with these previous evaluations as no significant habitat alterations have occurred since the publication of these documents.

The Port-owned properties surrounding STIA are characterized by urbanized development and consist of residential, commercial, and urban green space (parks, cemetery, or forests/wetlands). The BA prepared for the STIA CDP in 2007 reported that approximately 50% of STIA and adjacent properties within the CDP study area consisted of impervious surfaces such as runways, terminal areas, roofs, roads, and parking areas, while the other 50%

was pervious area (landscaped plantings and grasses on private property, public green space, wetlands, etc.) (Herrera 2007). Based on a review of recent aerial imagery, this ratio of pervious/impervious surfaces remains approximately the same for the lands within the Study Area (Google Earth 2013).

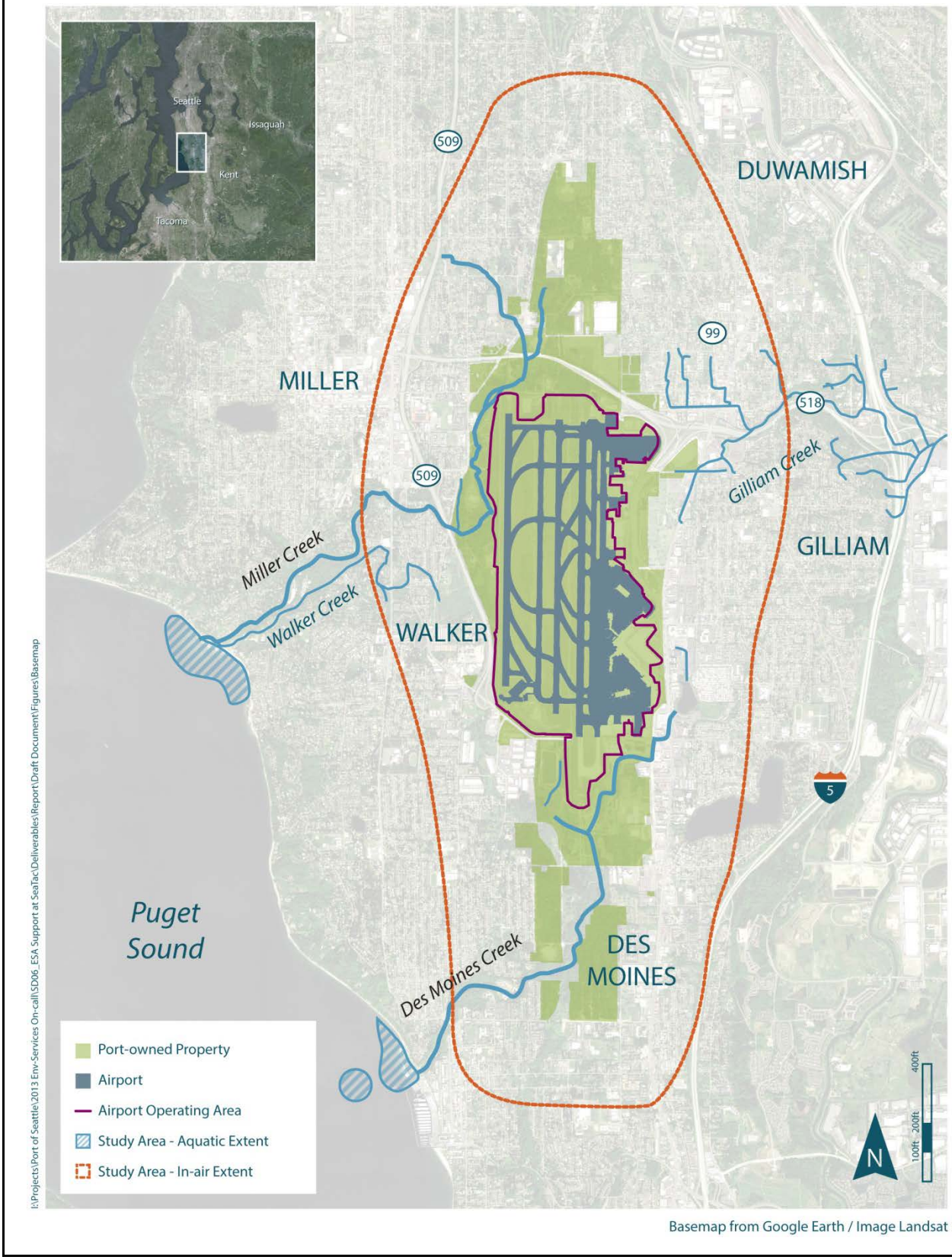

Figure 1
Study Area
Endangered Species Review
Sea-Tac International Airport

3 ENDANGERED SPECIES ACT OVERVIEW

The ESA, passed in 1973, is a federal act designed to provide legal protections to threatened or endangered species and their habitats for any project with a federal nexus. Under the ESA, species of plants and animals can be listed as either "endangered" or "threatened" according to assessments of the risk of their extinction. An endangered species is defined under the ESA as "any species which is in danger of extinction throughout all or a significant portion of its range." A threatened species is defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The term "federal nexus" applies when a project involves federal funding, a federal permit or approval, use of federal lands, or a federal program. Due to the potential for construction and operational impacts from Port activities in the Study Area to affect ESA-listed species and the associated federal nexus (e.g., FAA funding or the need to obtain a federal permit), activities conducted by the Port in the Study Area may need to comply with the requirements of the ESA.

The ESA is administered primarily by USFWS and NMFS. If federal actions or actions of nonfederal parties with a federal nexus might affect a listed species or the lands identified as critical habitat for the species survival, the federal action agency must complete a BA.

The assessment is then used as the basis of consultation between the lead federal agency and USFWS and/or NMFS. Through consultation with either USFWS and/or NMFS, federal agencies must ensure that their actions are "not likely to jeopardize the continued existence" of any endangered or threatened species, nor to adversely modify critical habitat. This is referred to as a Section 7 consultation. "Action" includes any activity authorized, funded, or carried out by a federal agency, including permits and licenses, and "jeopardize" is generally interpreted to mean undertaking an action that has reasonable likelihood, either directly or indirectly, of measurably decreasing the potential for continued survival and recovery of a listed species in the wild by reducing the reproduction, number, or distribution of that species (50 CFR § 402.02).

If an action will neither jeopardize a species nor adversely modify critical habitat, the Secretary issues a Biological Opinion to that effect, and the agency is provided with a written

incidental take statement, specifying the terms and conditions under which the federal action may proceed in order to avoid jeopardy or adverse modification of critical habitat. Alternatively, if the proposed action is judged to jeopardize listed species or adversely modify critical habitat, the Secretary must suggest any reasonable and prudent alternatives that would avoid harm to the species. The majority of consultations result in "no jeopardy" opinions, and nearly all of the rest find that the project has reasonable and prudent alternatives that will permit it to go forward.

Under Section 7 of the ESA, federal agencies are required to consult with the Secretary about proposed actions that might affect a listed species; to use their authorities in furtherance of the ESA; and to insure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species, or to destroy or adversely modify critical habitat unless the agency has been granted an exemption under the ESA.

Most Port projects within the Study Area that have a federal nexus would address ESA compliance through a Section 7 consultation process.

4 HABITAT TYPES IN STUDY AREA

The habitats found in the Study Area and potentially used by ESA-listed species can be broadly classified into the following categories (see Figure 2 and Sections 4.1 through 4.5): nearshore/estuaries, streams/creeks, wetlands, grasslands, and forests.

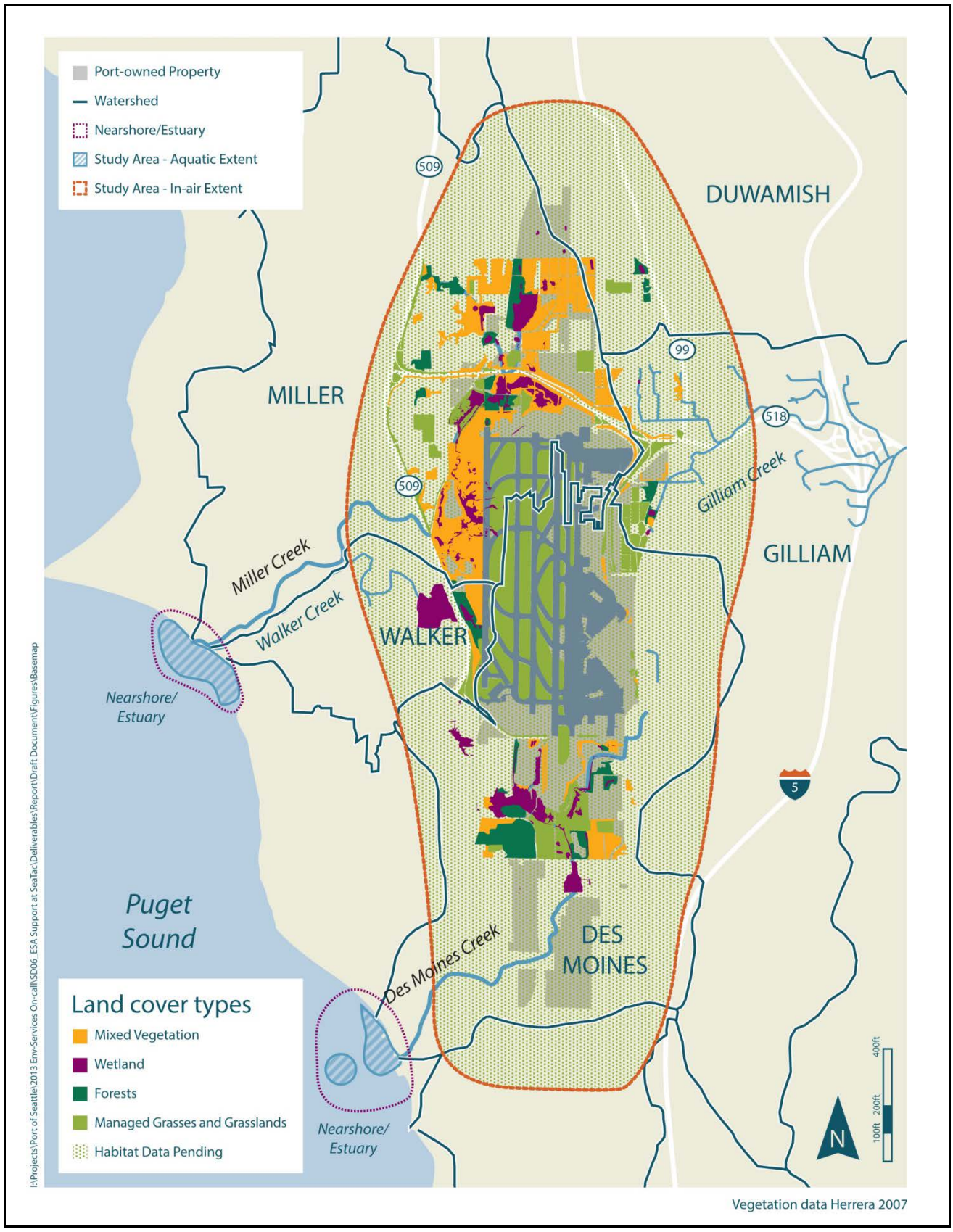

Figure 2
Habitat Types Within Study Area
Endangered Species Review
Sea-Tac International Airport

4.1 Nearshore/Estuaries

The Study Area includes the nearshore and estuarine areas around the discharge points of both Des Moines Creek and Miller Creek because potential stormwater effects resulting from airport actions could extend to these areas (Figure 2). These areas are characterized by overhanging salt marsh vegetation near the creek mouth, and the intertidal zone substrates include cobble, small boulders, and sand. The estuary of Des Moines Creek is also characterized by artificially harder areas around the mouth, including some riprap and concrete bulkheads. These estuarine areas provide habitat for many salmonids and certain species of juvenile and larval rockfish.

The Study Area does not extend beyond the lower intertidal areas of these estuaries as effects from stormwater are expected to be limited due to the need to comply with federal and state water quality criteria for discharges; therefore, the Study Area does not include waters greater than 20 feet deep.

4.2 Streams/Creeks

There are three drainage basins in the Study Area that are connected to the airport stormwater system (Figure 2): the Miller Creek, Des Moines Creek, and Gilliam Creek basins.

The Miller Creek Basin drains about 5,700 acres to the north and northwest of STIA. The Miller Creek watershed includes portions of Normandy Park, the City of SeaTac, and the City of Burien. Four subbasins within the Miller Creek Basin drain to Miller Creek via the outfall of Lake Reba (R.W. Beck 2006).

Miller Creek is about 4.8 miles long. From its origin in bogs, wetlands, lakes, and depressions (e.g., Tub, Reba, Lora and Burien lakes) north of STIA, the headwaters of the stream form east and west forks that flow south. The east fork drains a small basin and is not perennial, while the west fork drains a larger basin and currently forms the main branch (Williams et al. 1975). Just north of State Route (SR) 518, the two forks join together. The stream then flows to the south and southwest adjacent to STIA before turning west and flowing under Des Moines Memorial Drive, SR 509, and 1st Avenue South. West of 1st Avenue South,

Miller Creek flows to the southwest through a well-incised ravine and drains into Puget Sound via a small estuary (Herrera 2007).

Miller Creek is on the 2012 Washington State Department of Ecology (Ecology) 303(d) list for having Total Maximum Daily Loads (TMDLs) in place for bacteria and dissolved oxygen (Ecology 2012). Ecology has also identified other water quality parameters of concern in Miller Creek including pH, copper, zinc, and lead. Walker Creek is a short tributary to Miller Creek with similar habitat characteristics to Miller Creek (Herrera 2007). Walker Creek is not listed on Ecology's 303(d) list (Ecology 2012). There is no documented Chinook salmon presence upstream of the Miller Creek estuary (Fisher, personal communication 2014).

The Des Moines Creek Basin drains about 3,600 acres to the southeast and south of STIA including portions of King County and the cities of Des Moines, Normandy Park, and SeaTac. Seven subbasins discharge to Des Moines Creek via the outlet of the Northwest Ponds, direct discharges to Des Moines Creek, and via a Bow Lake outlet prior to daylighting in Des Moines Creek (R.W. Beck 2006).

Des Moines Creek is 3.7 miles long and flows into Puget Sound (Williams et al. 1975). The headwaters of the east branch, which is considered the mainstem, are conveyed through underground pipes or approximately 0.5 mile. The west branch originates from a stormwater detention complex and joins the east branch south of the airport property. Downstream of South 200th Street, the creek flows through an incised ravine and then drains into Puget Sound (Des Moines Creek Basin Committee 1997). The ravine is a high-gradient reach that the stream has cut to hardpan for most of its length. The creek is paralleled within the ravine by a paved trail and/or service road and sewer line protected in places by rock-bank armoring. Des Moines Creek enters Puget Sound through Des Moines Park located in the City of Des Moines. Within the park, two bridges cross the creek and the stream bank is stabilized with riprap. Riparian vegetation consists of grass, deciduous trees, and sparse ornamental shrubs.

No ESA-listed species presence is documented in Des Moines Creek (WDFW 2014).
Des Moines Creek has several water quality parameters of concerns and is also on the 2012

Ecology 303(d) list for having TMDLs in place for bacteria and dissolved oxygen (Ecology 2012).

The Gilliam Creek Basin to the northeast of the airport is 1,800 acres and drains portions of Tukwila and the remainder of the city of SeaTac (R.W. Beck 2006). One subbasin of Gilliam Creek discharges to the City of SeaTac storm drains and ultimately to Gilliam Creek.

The headwaters of Gilliam Creek arise from subsurface flows contained in pipes originating from stormwater runoff located south of SR 518, west of International Boulevard, north of South 170th Street, and east of Air Cargo Road. The creek emerges from a pipe north of South 160th Street and east of International Boulevard, flows east through culverts, and crosses under the I-5/I-405 interchange before discharging to the Green River in the vicinity of the City of Tukwila (Tukwila 2001). Gilliam Creek, which has been affected by regional development, is extensively channeled through culverts and receives stormwater runoff that causes high peak flows and low baseflows.

No ESA-listed species presence is documented in Gilliam Creek (WDFW 2014). Gilliam Creek is not listed on Ecology's 303(d) list (Ecology 2012).

4.3 Wetlands

There are numerous existing wetlands within the Study Area, including native wetlands, farmed wetlands, and jurisdictional ditches and channels, that are located primarily to the north, south, and west of STIA (Herrera 2007). Wetlands are found where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season (Cowardin et al. 1979). Natural wetlands are found in areas where natural conditions, such as soil types and topography, allow for water retention to occur. Farmed wetlands were once natural wetlands, but are located in agricultural zones and subject to the effects of ongoing agricultural practices. These agricultural activities typically result in impacts to the wetlands that affect a wetland's ability to function as it would if it were in a natural condition. Jurisdictional ditches are constructed ditches that have a hydrological or ecological connection to traditionally navigable waters (TNW) of the United States. The U.S. Army Corps of Engineers assesses

ditches with hydrological or ecological connections to TNWs and will make a jurisdictional determination as to whether these features are regulated under the Clean Water Act (CWA). Small wetlands were identified within STIA near the third runway, with larger wetlands located on Port-owned properties and associated with Miller Creek and Des Moines Creek (Herrera 2007; NWI 2014).

Wetland types within the Study Area have been documented to include forested wetlands, scrub-shrub wetlands, emergent wetlands, riverine wetlands, and open water wetlands, ranging from less than 0.5 acre to more than 35 acres in size (Herrera 2007). Some of the wetland areas are managed by the Port for mitigation purposes (Maney, pers. comm. 2014).

There are no known ESA-listed species in the Study Area that require wetland habitat for their entire life history; however, various fish and bird species could potentially use wetland areas for refugia, foraging, and other activities.

4.4 Grasslands and Managed Grasses

The Study Area is within the Puget Sound Lowland-Douglas fir vegetation zone (Della Salla et al. 2001). However, existing airport and previous agricultural development actions have largely eliminated the natural vegetation typically occurring in this vegetation zone. The largest open areas of grassland habitat within the Study Area are the managed grasses within the runway areas as well as the grasses and mixed vegetation areas to the west of STIA.

Vegetation within the airport and adjacent Port-owned properties is dominated by non-native grasses and herbaceous groundcover and shrubs. Small patches of native forest and shrub vegetation occur on Port-owned properties. There are no rare plants or high-quality ecosystems present in the vicinity of the STIA based on searches conducted by Washington Natural Heritage Program nor during plant surveys conducted for the CDP activities, which largely overlap the Study Area for this report (WDNR 2014; Herrera 2007).

The grasslands at STIA represent suitable habitat for streaked horned lark based on the characteristics of the critical habitat that has been designated elsewhere for streaked horned

lark; however, while horned larks have been observed at STIA, no conclusive evidence of streaked horned lark presence at STIA has been identified (Anderson 2014b).

4.5 Forests

There are small, relatively isolated patches of forested areas—generally associated with stream corridors and located to the north, south, and west of STIA—within the Study Area. The forested areas to the north include the north runway protection area (between the runway and SR 518), which is predominantly forest and shrub wetland. The area north of the airport also includes Tub Lake, which is a quaking fen with unique condition and uncommon flora (e.g., Labrador tea, cranberry). Areas to the south include deciduous and evergreen tree species, including alder, cottonwood, Douglas fir, western red cedar, western hemlock, and other ornamental trees (Herrera 2007). The Port recently constructed approximately 85 acres of forest and shrub mitigation along the west embankment of the third runway.

There are no known ESA-listed species in the Study Area that require the type of forested habitat present within the Study Area for their entire life history; however, various terrestrial and bird species could potentially use forest habitat for refugia, foraging, and other activities.

5 SPECIES CONSIDERED FOR ESA COMPLIANCE

This section provides and evaluates the ESA-listed species, candidate species, and likely future listings to determine the likelihood of presence within the Study Area and the potential for development projects within the Study Area to affect these species.

Anchor QEA reviewed USFWS and NMFS databases and critical habitat maps to identify the potential for ESA-listed species and their associated critical habitats to occur in the Study Area. This process was initiated by reviewing all listed, candidate, and potential ESA species known to occur within Washington, focusing primarily on species within King County, Washington. These lists were refined to include only those species and habitats expected to occur in the Study Area or that have been documented in adjacent counties and have habitat preferences or requirements similar to those found within the Study Area (Appendix A).

5.1 ESA Species Screening

In general, there are few ESA-listed species that are likely to be present within the Study Area given documented species occurrences, habitat types present, and habitat conditions, as well as the pervasive human-dominated land-use activities that occur within the Study Area.

A comprehensive inventory of ESA-listed wildlife species that occur in Washington and particularly King County or offshore of the County in the waters of Puget Sound (detailed in Appendix A) was reviewed and compared against the habitat types identified in the Study Area. Based on this review, many listed species can be excluded from further review in this document. The excluded species have no documented presence in the Study Area, or lack preferred habitat or food sources within the Study Area. Therefore, these species are unlikely to be affected by construction activities at STIA or nearby Port-owned properties. The previously completed Environmental Impact Statement for the Des Moines Creek Business Park development also documented a lack of evidence of threatened, endangered, or sensitive vegetation, wildlife, or unique wildlife habitat on the Des Moines Creek Business Park site (POS 2006).

Table 1 shows the results of an evaluation of the likelihood that ESA-listed, candidate, and potential species may occur in the Study Area, and whether critical habitat has been designated in the Study Area.

Table 1

Study Area Presence and Critical Habitat Status of ESA-listed and Candidate Species

Species	Federal Listing Status and Agency	Species Presence in Study Area	ESA Critical Habitat in Study Area
Amphibians			
Oregon spotted frog (*Rana pretiosa*)	Proposed Threatened (USFWS)	No	Critical habitat has not been designated
Birds			
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened (USFWS)	No	No critical habitat in the Study Area
Northern spotted owl (*Strix occidentalis caurina*)	Threatened (USFWS)	No	No critical habitat in the Study Area
Yellow-billed cuckoo (*Coccyzus americanus*)	Proposed Threatened (USFWS)	No	No critical habitat in the Study Area
Fishes			
Coastal-Puget Sound DPS bull trout (*Salvelinus confluentus*)	Threatened (USFWS)	Yes	Critical habitat designated within Miller Creek and Des Moines Creek estuaries
Puget Sound ESU Chinook salmon (*Oncorhynchus tshawytscha*)	Threatened (NMFS)	Yes	Critical habitat designated within the estuaries of Miller Creek and Des Moines Creek
Puget Sound DPS steelhead (*Oncorhynchus mykiss*)	Threatened (NMFS)	Yes	Critical habitat proposed for nearshore Puget Sound in the vicinity of Miller Creek and Des Moines Creek estuaries
Puget Sound/Georgia Basin DPS yelloweye rockfish (*Sebastes ruberrimus*)	Threatened (NMFS)	No	Critical habitat proposed for Puget Sound
Puget Sound/Georgia Basin DPS canary rockfish (*Sebastes pinniger*)	Threatened (NMFS)	Yes	Critical habitat proposed for Puget Sound
Puget Sound/Georgia Basin DPS bocaccio (*Sebastes paucispinis*)	Endangered (NMFS)	Yes	Critical habitat proposed for Puget Sound
Mammals			
Canada lynx (*Lynx canadensis*)	Threatened (USFWS)	No	No critical habitat in the Study Area
Fisher (*Martes pennanti*)	Candidate (USFWS)	No	Critical habitat has not been designated

Species	Federal Listing Status and Agency	Species Presence in Study Area	ESA Critical Habitat in Study Area
Gray wolf (*Canis lupus*)	Endangered (USFWS)	No	Critical habitat has not been designated
Grizzly bear (*Ursus arctos horribilis*)	Threatened (USFWS)	No	Critical habitat has not been designated
North American wolverine (*Gulo gulo luscus*)	Proposed Threatened (USFWS)	No	Critical habitat has not been designated
Southern Resident killer whale (*Orcinus orca*)	Endangered (NMFS)	No	Chinook salmon are prey species included in the Southern Resident killer whale critical habitat designation

Notes:
DPS = distinct population segment
ESU = evolutionarily significant unit
NMFS = National Marine Fisheries Service
USFWS = U.S. Fish and Wildlife Service

Canada lynx, gray wolves, grizzly bears, northern spotted owl, and North American wolverine have habitat requirements for forested old growth habitat or habitat within upper elevations of the Cascade range, and are therefore discounted from further consideration because there is no suitable habitat for these species in the Study Area, and no occurrences of these species have been documented in the project vicinity (Herrera 2007).

No critical habitat for northern spotted owl, marbled murrelet, or Canada lynx has been designated within the Study Area (USFWS 2014a) and critical habitat has not been designated for gray wolves, grizzly bears, and North American wolverine (USFWS 2014d). The CDP action area was noted to be located in the Puget Sound Conservation Zone for marbled murrelet in the marbled murrelet Recovery Plan (USFWS 1997). However, critical habitat for the murrelet is not located within the Study Area (USFWS 2014a). Recently, USFWS indicated that they will no longer be evaluating project impacts related to murrelet transiting over construction areas (O'Haleck et al., pers. comm. 2014).

Puget Sound/Georgia Basin yelloweye rockfish occur in waters 80 to 1,560 feet deep, but are most commonly found between 300 to 590 feet in depth (Love et al. 2002). This deep, rocky habitat does not exist in the Study Area. Also, unlike bocaccio and canary rockfish, juvenile yelloweye rockfish are not typically found in intertidal waters (Love et al. 1991; Studebaker et al. 2009), but are most frequently observed in waters deeper than 98 feet (30 meters) near the upper depth range of adults (Yamanaka et al. 2006). Because juvenile yelloweye rockfish do not typically occupy shallow waters (Love et al. 1991; Studebaker et al. 2009), they are not expected to be present in the Study Area.

Marine species such as humpback whale and listed sea turtles are not included in this document because the habitats in the Study Area are not expected to support these species. The Study Area does not include deep water marine environments required by humpback whales, nor does it directly support prey species for humpback whales. No deepwater marine habitat for migrating/foraging sea turtles or beach areas along the coast where turtles would likely nest exist in the Study Area.

There are no reports of listed plants in the vicinity of the Study Area. Golden paintbrush (*Castilleja levisecta*) was historically found in King County, but is not found in this region of King County (USFWS 2014d).

Additional proposed and candidate species were identified within King County that can likely be discounted from further ESA evaluation for projects within the Study Area unless new information is identified by the regulatory agencies that significantly changes the species' known habitat preferences or distribution.

The fisher is a medium-sized mammal (part of the weasel family) native to North America and a candidate species for USFWS. The species is present in the Olympic peninsula through a reintroduction program; the natural-born populations are believed to be extirpated in Washington (WDFW 2014). While the historical range may have overlapped with STIA or Port-owned properties, these are no longer suitable habitat for fisher because historically and currently, fishers avoid non-forested habitats such as open forest, grassland, and wetland habitats (USFWS 2012). The fisher has not been identified as a species that occurs on STIA property (Osmeck, pers. comm. 2014).

USFWS recently proposed the yellow-billed cuckoo for threatened species status. Yellow-billed cuckoos are officially considered extirpated in Washington, and the occasional sightings are migrants (Audubon Society 2014). USFWS is further evaluating species habitat and presence in western Washington as part of the proposed listing process (USFWS 2014b). The species prefers large stands of cottonwoods in riparian zones along the Columbia River, but the species was potentially historically present in Puget Sound lowlands (DOI 2013a). The STIA and Port-owned property within the Study Area may have been characterized as Puget Sound lowlands in the past, but as described in Section 3, almost no habitat of this type remains in the vicinity of STIA due to historical regional and airport development.

The Oregon spotted frog was proposed by USFWS for threatened status in 2013. USFWS is evaluating species habitat and presence north of Thurston County, Washington, as part of the proposed listing process (DOI 2013c). In Washington, current occurrences are in the Sumas River, Black Slough, Samish River, upper Black River drainage, lower Trout Lake Creek drainage, and at Conboy Lake and Camas Prairie in the Outlet Creek drainage

(WDFW 2013). Historically, it may have been present in the prairie lakes and streams that were found in Puget lowlands but it is not known to currently be present in King County (WDFW 2013). As previously mentioned, this habitat no longer occurs within the Study Area due to regional development. Additionally, expanded impervious surface and changes to local hydrology as a result of channeling creeks into pipes and other stormwater management actions have created conditions that do not support habitat for Oregon spotted frog within the Study Area.

5.1.1 South Puget Sound Prairie ESA-listed Species

Outside of King County, Washington, there have been several species listed over the last 6 months (October 2013 to April 2014) that occupy habitat in the South Puget Sound prairie ecosystem found in Thurston and Pierce Counties, and some of these species may occupy other similar habitat elsewhere. These prairie species are: Taylor's checkerspot butterfly, streaked horned lark (*Eremophila alpestris strigata*), and four sub-species of Mazama pocket gophers. These species were included as part of the review of current ESA-listed species because the prairie habitat conditions that are attractive or required for these species life histories are similar in some respects to the managed grassland habitat found in the Study Area. Some species, such as the streaked horned lark and Taylor's checkerspot butterfly, are found at other airports as well, such as Portland International Airport and the Olympia Airport, whereas the pocket gopher species are endemic to small areas of Thurston or Pierce counties, and Mazama pocket gophers found elsewhere in Washington are most likely other sub-species (DOI 2014).

The streaked horned lark was listed as threatened by USFWS in October 2013 (DOI 2013b). This species is known to occur in the South Puget Sound prairies of Thurston and Pierce counties, Joint Base Lewis-McChord, the Olympia Airport, as well as on managed grasslands at airports in Oregon (DOI 2013b). The streaked horned lark is somewhat migratory, but there is a considerable level of uncertainty remaining about the life history of this species and its migratory or other movements; range-wide surveys have not yet been completed (Anderson 2014a). The Port has had conversations with USFWS and FAA about monitoring for the streaked horned lark at STIA, and completed a presence study during the summer of 2014 (Anderson 2014b). No sitings of streaked horned larked were documented during the

survey. Based on the regulatory concerns and presence of managed grassland habitat at STIA, the streaked horned lark is included in the list of species that will be retained for further evaluation (see Section 5.2) and warrants consideration by the Port during future project planning activities.

The Taylor's checkerspot butterfly was listed as endangered by USFWS in October 2013, and critical habitat was designated (DOI 2013b). This species is known to occur in the South Puget Sound prairies of Thurston and Pierce counties, Clallam County, as well as on grasslands in the Willamette Valley of Oregon (DOI 2013b). Critical habitat does not exist in King County for this species. Habitat requirements for the Taylor's checkerspot butterfly consist of open grasslands and grass/oak woodland sites featuring food plants for larvae and nectar sources for adults, including figwort or snapdragon family (Scrophulariaceae), paintbrush (*Castilleja hispida*), and native and non-native *Plantago spp*. in the plantain family (Plantaginacea) (ODFW 2013). The species is very rare, and available information does not suggest that the Taylor's checkerspot butterfly occurs in Washington outside of the population areas identified as supporting critical habitat (DOI 2012). Therefore, the species is not likely to occur within the Study Area.

On April 9, 2014, USFWS published the final rule for threatened status and designated critical habitat for four sub-species of Mazama pocket gophers found in specific locations of Thurston and Pierce counties (DOI 2014). These four species of pocket gophers are: the Olympia pocket gopher (*Thomomys mazama pugetensis*), Roy Prairie pocket gopher (T*. m. glacialis*), Tenino pocket gopher (*T. m. tumuli*), and Yelm pocket gopher (*T. m. yelmensis*). Similar to the streaked horned lark, these gopher species are found in prairie lands in south Puget Sound, and are known to occur at Joint Base Lewis-McChord and the Olympia Airport. However, these species exhibit high site fidelity due to vegetation and soil preferences. Critical habitat designations include small habitat patches and do not include areas outside of Pierce or Thurston counties (DOI 2014). Available information does not suggest that any of the listed sub-species of Mazama pocket gopher exist elsewhere in Washington outside of the population areas identified as supporting critical habitat (DOI 2014). Therefore, none of the listed pocket gopher species are likely to occur within the Study Area.

5.1.2 ESA Species of Concern

ESA species of concern are species that have not been proposed for listing, but for which there is potential for future ESA listings if there is evidence that the species has become threatened or endangered. ESA listings may or may not occur for these species in the future. The following ESA species of concern may occur in the Study Area based on historic or known presence in the area and associated habitat requirements:

- Long-eared myotis (*Myotis evotis*)
- Long-legged myotis (*Myotis volans*)
- Northern goshawk (*Accipiter gentilis*)
- Olive-sided flycatcher (*Contopus cooperi*)
- Pacific lamprey (*Lampetra tridentata*)
- Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)
- Peregrine falcon (*Falco peregrinus*)
- Small-footed myotis (*Myotis ciliolabrum*)
- Valley silverspot butterfly (*Speyeria zerene bremnerii*)
- Western toad (*Bufo boreas*)

5.2 ESA Species Retained for Further Evaluation

Based on review of species information, available habitat information, and previously completed recent BAs, the species identified in Table 2 were carried forward for further evaluation in this document.

As shown in Table 2, there is no current presence or designated critical habitat for ESA-listed species located on STIA, airport adjacent Port-owned property, or within the Study Area. The mowed grassland area adjacent to STIA runways is noted as potentially suitable habitat for streaked horned lark, based on known presence on habitat of this type at the Olympia Airport; however, no conclusive evidence of streaked horned lark presence at STIA has been identified (Anderson 2014b).

Table 2

ESA Species, Habitat Presence, and Potential Impacts in Study Area

Species Name/ Critical Habitat	Federal Listing Status and Agency	Included in Previous STIA BA(s)?	Nearest Suitable Habitat	Airport Activity(ies) with Potential to Impact Species or Species Habitat
Streaked horned lark[1]	Threatened USFWS	No	Outside Study Area – This species is known to occur at the Olympia Airport, and prefers large expanses of open space similar to those created around airport runways. Evidence that it nests or forages at STIA is lacking (Anderson 2014b).	Airport runway grass mowing and maintenance (exempted by ESA 4(d) rule)
Streaked horned lark critical habitat[1]	Designated USFWS	No	Outside Study Area – While the Study Area is not currently included in the streaked horned lark critical habitat designation, USFWS has requested monitoring at STIA. ESA species status review processes and ongoing research that identifies streaked horned lark on STIA property could result in future modification to critical habitat.	Clearing and grading projects near STIA runways that reduce vegetative cover and/or leave ground inactive for a period of time may attract this species
Marbled murrelet	Threatened USFWS	Yes	Outside Study Area – Nests in old growth forest areas. Forages in marine areas of Puget Sound. May transit over some portion of Study Area.	Activities within Study Area are unlikely to affect this species based on information from USFWS that they will no longer evaluate in-air noise for transiting murrelets (O'Haleck et al., pers. comm. 2014)
Coastal-Puget Sound DPS bull trout	Threatened USFWS	Yes	Outside Study Area – Adults may use Puget Sound near the confluence with Miller and Des Moines creeks for foraging and migration.	Stormwater discharge and potential water quality deterioration in Miller Creek and Des Moines Creek
Coastal-Puget Sound bull trout DPS critical habitat	Designated USFWS	Yes	Critical habitat designation within estuaries of Miller Creek and Des Moines Creek.	Additional stormwater runoff driven by increase in impervious surface area or change in stormwater treatment and conveyance

Species Name/ Critical Habitat	Federal Listing Status and Agency	Included in Previous STIA BA(s)?	Nearest Suitable Habitat	Airport Activity(ies) with Potential to Impact Species or Species Habitat
Southern Resident killer whale	Endangered NMFS	Yes	Outside Study Area – Utilizes waters greater than 20 feet deep in Puget Sound.	Stormwater discharge and potential water quality deterioration in Miller Creek and Des Moines Creek and impacts to water quality that affects prey species (Chinook salmon)
Southern Resident killer whale critical habitat	Designated NMFS	Yes	Outside Study Area – Critical habitat designation does not generally overlap with nearshore areas around confluence of Miller or Des Moines creeks. However, prey species (Chinook salmon) may use these habitats.	Impervious surface area increase stormwater treatment and conveyance; impacts to water quality that affect prey species (Chinook salmon)
Puget Sound/Georgia Basin DPS canary rockfish	Threatened NMFS	No	Puget Sound – Larval stage is distributed by currents, and juveniles may be found in nearshore areas with appropriate substrates. Adults are unlikely to occur in nearshore due to water depth requirements.	Additional stormwater runoff driven by increase in impervious surface area or change in stormwater treatment and conveyance
Puget Sound/Georgia Basin DPS canary rockfish critical habitat	Proposed NMFS	No	Puget Sound – Larval stage is distributed by currents, and juveniles may be found in nearshore areas with appropriate substrates. Adults are unlikely to occur in nearshore due to water depth requirements.	Additional stormwater runoff driven by increase in impervious surface area or change in stormwater treatment and conveyance
Puget Sound/Georgia Basin DPS bocaccio	Endangered NMFS	No	Puget Sound – Larval stage is distributed by currents, and juveniles may be found in nearshore areas with appropriate substrates. Adults are unlikely to occur in nearshore due to water depth requirements.	Additional stormwater runoff driven by increase in impervious surface area or change in stormwater treatment and conveyance

Species Name/ Critical Habitat	Federal Listing Status and Agency	Included in Previous STIA BA(s)?	Nearest Suitable Habitat	Airport Activity(ies) with Potential to Impact Species or Species Habitat
Puget Sound/Georgia Basin DPS bocaccio critical habitat	Proposed NMFS	No	Puget Sound – Larval stage is distributed by currents, and juveniles may be found in nearshore areas with appropriate substrates. Adults are unlikely to occur in nearshore due to water depth requirements.	Additional stormwater runoff driven by increase in impervious surface area or change in stormwater treatment and conveyance
Puget Sound ESU Chinook salmon	Threatened NMFS	Yes	Adults may use Puget Sound near the mouth of Miller Creek and Des Moines Creek for foraging and migration.	Stormwater discharge and potential water quality deterioration in Miller Creek and Des Moines Creek
Puget Sound ESU Chinook salmon critical habitat	Designated NMFS	Yes	Critical habitat designation within estuaries of Miller Creek and Des Moines Creek.	Additional stormwater runoff driven by increase in impervious surface area or change in stormwater treatment and conveyance
Puget Sound DPS steelhead	Threatened NMFS	Yes	Adults may use Puget Sound near the confluence with Miller Creek and Des Moines Creek for foraging and migration.	Stormwater discharge and potential water quality deterioration in Miller Creek and Des Moines Creek
Puget Sound DPS steelhead critical habitat	Proposed NMFS	Yes	Critical habitat proposed for nearshore Puget Sound in the vicinity of the estuaries of Miller Creek and Des Moines Creek.	Additional stormwater runoff driven by increase in impervious surface area or change in stormwater treatment and conveyance

Notes:

1 Streaked horned lark and their associated critical habitat are not found in King County. The species and critical habitat are included in this evaluation due to their presence at other airports in Washington with similar habitat characteristics to STIA. Anchor QEA was specifically asked to address streaked horned lark and critical habitat presence at STIA as part of this evaluation.

DPS = distinct population segment

ESU = evolutionarily significant unit

5.3 Related Species Protection Considerations

Steller sea lion and bald eagle have been delisted from the ESA since the last BA completed for STIA activities. These species and others are protected under the Marine Mammal Protection Act (MMPA), and Bald and Golden Eagle Act and Migratory Bird Treaty Act (MBTA), respectively.

Permits may be obtained under the MMPA for actions that may result in harassment or take of marine mammal species. However, based on the expected future development and associated construction and operational effects within the Study Area, impacts to marine mammals are unlikely to occur.

Permits can be obtained for incidental harassment or lethal take of migratory bird species, such as the MBTA hazing permits held by the Port to address bird hazards at STIA. In addition to airport activities, certain construction activities may impact migratory birds. Species of bank swallow are known to nest in unmanaged soil stockpiles, and disrupting these stockpiles when nests are active results in a species take, which can lead to fines (see USDOJ 2012). As an example of how common migratory bird species are within the Study Area, Table 3 lists common bird species that were identified during wildlife assessments related to the Des Moines Creek Business Park project (POS 2006). While this list is not comprehensive or exclusive of all the migratory bird species that could be found in the Study Area, it speaks to the fact that even many common species are protected by MBTA. Of the species in Table 3, only two are not provided protection from take or harassment by the MBTA. To avoid harassment or take of MBTA species, it is important when planning construction timing to take into account active nesting and fledging seasons, particularly for projects involving vegetation and ground clearing/grading activities.

Table 3
Migratory Bird Species Within Study Area

Species Common Name	Species Scientific Name
Sharp-shinned hawk	*Accipiter striatus*
Coopers hawk	*Accipuer cooperii*
Red-tailed hawk	*Buteo jamaicensis*
American goldfinch	*Carduelis tristis*

Species Common Name	Species Scientific Name
Brown creeper	*Certhia fcnniliaris*
Northern flicker	*Colaptes auratus*
Common crow	*Corvus brachyrhynchos*
Steller's jay	*Cyanocitta stelleri*
Yellow warbler	*Dendroica petechia*
Dark eyed junco	*Junco hyemalis*
Song sparrow	*Larus hyperboreus*
Black-capped chickadee	*Pares atrcapillus*
House sparrow	***Passer domesticus***
Downy woodpecker	*Picoides pubescens*
Hairy woodpecker	*Picoides villosus*
Bushtit	*Psaltriparus minimus*
Barn swallow	*Riparia riparia*
Red-breasted nuthatch	*Sitta canadensis*
European starling	***Sturnus vulgaris***
Tree swallow	*Tachycineta bicolor*
American robin	*Turdus migratorius*
White-crowned sparrow	*Zonotrichia leucophrys*

Notes:
Species in **bold** text are not protected by the MBTA
Table shows species observed on the Des Moines Creek Business Park project site (POS 2006)

5.4 Potential Habitat Changes

King County has conducted and reported on a number of different studies evaluating the potential effects of climate change on habitat and species within King County, and notes that climate change impacts to the local environment may include some of the following: increases in flashy/episodic runoff in small streams from more extreme weather events; overall declines in summer runoff due to reduced snowpack; increases in urban heat island effects; losses or increases in losses of wetland and nearshore habitat acreage; changes in the timing and duration of the growing season; decreases in species abundance; increases in species morbidity; and increases in biological invasions and occurrences of harmful algal blooms (King County 2013).

While the ESA species review conducted for this document found no compelling evidence on STIA or adjacent Port-owned property of current presence of any proposed and candidate species, it is possible that the current suite of species present within the Study Area may change over time under certain climate scenarios. Species that may currently be listed and not present in the Study Area may become associated with Study Area habitats in the future due to shifting habitat conditions or availability of resources.

6 POTENTIAL EFFECTS FROM DEVELOPMENT WITHIN THE STUDY AREA

This section provides a brief discussion of the types of potential effects from airport operations or potential development activities at STIA and adjacent Port-owned properties that could reasonably be expected to affect ESA-listed listed species (Table 2) or their habitat located within the Study Area.

The identification and discussion of the potential construction effects of potential development projects is informed by the information evaluated and presented in the 2007 BA prepared for the CDP for the Port by Herrera, as many of the project actions and effects are expected to be similar to the potential development actions being considered for the next 5 to 10 years within the Study Area. These projects may include commercial or transit-related development consistent with overall airport land-use. Additional information regarding construction activities and effects, particularly related to an evaluation of construction noise, was informed by the Washington State Department of Transportation (WSDOT) BA development guide (2013).

Likely categories of direct project effects expected to occur as a result of the process of constructing projects located within the Study Area include noise, water quality, habitat fragmentation, and vegetation removal (see Section 6.1). Indirect effects, such as increased erosion or stormwater runoff from expanded impervious surfaces, would be anticipated to occur based on the types of projects that would be completed at STIA or development of Port-owned properties (see Section 6.2).

For all construction and development projects that would impact wetlands or waters of the United States, mitigation activities are expected to occur to first avoid impacts and then ensure no net loss of function consistent with the requirements of CWA Section 404(b)(1). Section 6.3 includes a discussion of potential avoidance and minimization measures, as well as positive habitat changes (mitigation) that could occur.

6.1 Direct Construction Impacts

Construction could include development of new structures and buildings at STIA and/or improvements to existing facilities (such as runway and pavement rehabilitation or new

passenger handling facilities). Development may also occur on Port-owned land within the Study Area such as construction of commercial and light industrial facilities. Any of the proposed or potential activities would likely result in direct construction impacts, such as vegetation removal (grubbing) and grading activities including excavation and fill.

There are several types of effects that construction activities might create. Construction-related noise would be generated by construction machinery and demolition, ground-improving, or building activities. Water quality of the streams within the Study Area may be temporarily directly affected by construction-related stormwater runoff, erosion from disturbed areas, or vegetation removal along or near streams or wetlands.

6.1.1 Vegetation Clearing and Habitat Fragmentation

Impacts to existing vegetation and habitats from potential development projects will depend upon the nature of the project and its location, as well as the quality of the existing vegetation and habitat in the project area. Projects located on Port-owned properties within the Study Area may impact lawns and grassy areas, mixed shrub/grass vegetation, or forested areas. Some of the areas affected by vegetation removal may be currently vegetated predominantly by invasive or non-native species.

For proposed projects located at STIA, new construction may result in clearing and grading of the managed grass areas within and around the STIA runways and may include a loss of the managed grasses located within the airfield. This could result in areas of managed grass areas being converted to pavement or other impervious surfaces.

Projects adjacent to Des Moines or Miller creeks could affect the amount and quality of riparian vegetation. Removal of or reductions in the amount of riparian habitat may result in erosion and sedimentation impacts, reduced shading and water temperature impacts, changes in invertebrate prey availability, reduced bank stability, and reduced availability of large woody debris. Similar impacts would be expected if project activities involve placement of fill or disturbance of vegetation within wetlands. However, direct wetland and wetland buffer impacts resulting from specific projects would be evaluated as these projects are developed.

Clearing vegetation within the STIA runway areas could result in the loss of open grassland habitat and may reduce habitat availability. In particular, grassy habitat that is subject to frequent disturbance is suitable habitat for streaked horned lark, although there is currently no documentation of streaked horned lark presence at STIA.

Vegetation clearing activities would likely require permits for CWA compliance, or other local grading and development permits. Compliance with these permits typically includes implementation of best management practices (BMPs) to manage or reduce the potential impacts of the project on adjacent resources—either through fencing to protect remaining vegetation or erosion control and stormwater control measures to prevent runoff from disturbed sites. With these appropriate BMPs in place during construction activities, vegetation removal required for proposed projects would be unlikely to result in sedimentation to the Miller Creek or Des Moines Creek basins. However, it is possible that vegetation removal within the riparian zone of these creeks or their tributaries may result in water quality impacts. Further, fragmentation of habitat could occur as areas along habitat corridors or within habitat areas are cleared. This habitat fragmentation may result in effects to ESA-listed species. For example, clearing trees along a riparian area may impact associated communities of insects that are prey species for listed fish species such as Chinook salmon. If Chinook salmon populations are impacted by the lack of available insects for prey, the effect to Chinook salmon populations may in turn may indirectly affect killer whales due to a lack of available prey.

Due to the small size of these creeks and the fact that they do not directly support listed fish stocks, vegetation removal activities within the Study Area are unlikely to affect listed fish species that may occur in the lower reaches of Des Moines Creek or Miller Creek. Critical habitat for listed fish species is confined to the estuaries and nearshore areas in the vicinity of Miller and Des Moines creeks, and again, with proper BMP implementation, vegetation removal would be unlikely to affect these critical habitats. Killer whale and killer whale critical habitat would not be affected by vegetation removal and the potential sedimentation except if those actions affected prey availability.

6.1.2 Grading, Excavation, and Fill

Excavation, fill, and grading activities would be required to construct projects within the Study Area. Disturbed land surfaces and soil stockpiles are prone to erosion. Permits for grading and fill activities (for example, building permits, grading permits, CWA Section 401 Water Quality Certifications, and National Pollutant Discharge Elimination System [NPDES] Construction General Permits) require implementation of BMPs as site erosion control and stormwater management measures. Grading and fill activities undertaken in compliance with these required permits and associated BMPs are unlikely to result in conveyance of on-site soils to creeks within the Study Area. However, it is possible that on-site soils could be conveyed via stormwater runoff into creeks within the Study Area that lead to Puget Sound.

Based on typical construction practices at the Port, it is anticipated that all construction activities will include appropriate erosion control measures and other BMPs to comply with project permits and ensure that excavation and fill materials would be contained on-site. Therefore, while listed fish species may be present in the lower reaches of Des Moines Creek or Miller Creek, it is unlikely that listed fish species would be affected by excavation and fill impacts resulting from construction and development. Similarly, critical habitats for listed salmonids in Puget Sound would not be expected to be affected by increased turbidity levels potentially generated by construction projects within the Study Area.

Killer whales and killer whale critical habitat would not be affected by these activities because potential impacts would be confined to some portion of the Study Area and would not extend to marine areas.

During excavation and fill activities, it is possible that suitable perch, nesting, or foraging habitat for birds would be removed, or landscapes with potentially suitable habitat for birds would be disturbed. As described earlier, marbled murrelets would not be affected by potential sedimentation impacts associated with these activities, because impacts would be confined to the Study Area, and would not extend to marine areas where murrelets could be foraging. No old growth trees remain within the Study Area, and therefore no suitable marbled murrelet habitat exists in the Study Area. Streaked horned lark prefer the habitat found within the grassy areas of airport runways from the Willamette Valley to South Puget Sound (USFWS 2014c). Excavation, fill, or grading of grassy areas near STIA runways may

alter, temporarily degrade, or otherwise result in unsuitable habitat conditions for streaked horned lark, although this species is not currently known to utilize STIA as habitat.

6.1.3 Noise

Typical construction equipment that might be expected to be used for projects within the Study Area would produce point-source noise levels. Equipment may include jackhammers (100 dBA[1]), excavators (97 dBA), trucks (96 dBA), graders (93 dBA), backhoes (90 dBA), concrete mixers (89 dBA), pavers and grinders (89 dBA), and compressors (88 dBA) (WSDOT 2013). Considering the two loudest noise sources—excavators and jackhammers—the construction-related noise levels associated with the combined noise of multiple pieces of machinery would not exceed 101 dBA (WSDOT 21013).

As described in Port environmental documents, peak noise levels generated by aircraft noise at the airport range from 80 to 90 dBA, and in the absence of these periodic noise events, baseline noise levels are likely closer to 60 dBA (Herrera 2007). Given the amount of paved surfaces within the Study Area, and based on WSDOT noise evaluation guidance, noise impacts associated with construction equipment (jackhammers and excavators) could extend up to 0.6 mile from the locations where construction activities would occur before they are attenuated to background noise levels. The outer boundary of the Study Area was set at approximately this distance to account for a noise-based buffer.

While there would be noise generated by construction activities for various development and improvement projects, it will be unlikely to be at levels that would disturb listed or protected bird species. Construction noise is not anticipated to result in impacts to habitat, and is generally unlikely to be elevated to a level that is known to adversely affect species.

[1] Both underwater and in-air noise are measured in decibels (dB). The "A-weighted" adjustment of noise (shown as dBA) is used for in-air noise to correlate to the human interpretation of noise in the same frequency range that humans hear. The A-weighted decibel scale begins at zero, which represents the faintest sound level that humans with normal hearing can hear. Decibels are measured on a logarithmic scale so each 10 dB increase doubles the sound; therefore, a noise level of 70 dBA is twice as loud to the listener as a noise of 60 dBA. The dBA is generally presented as the sound measured at 50 feet from the source, unless otherwise noted.

Marbled murrelets flying over the airport are expected to be at sufficiently high altitudes that noise associated with construction equipment at the airport would be indistinguishable from the heavy vehicle traffic and other construction activities in the vicinity of the airport. In addition, noise from airborne aircraft at these altitudes would overwhelm any noise generated on the ground. No suitable marbled murrelet habitat exists in the Study Area; therefore, marbled murrelet are not expected to be present.

The anticipated projects being considered by the Port within the Study Area do not include actions in waterways or Puget Sound; therefore, no in-water construction noise would be generated and none of the in-air noise impacts described above would extend to surface waters. As a result, listed fish species would not be affected by construction-related noise. Marine species and designated critical habitats in estuarine and marine areas would not be exposed to any noise impacts as a result of Port projects within the Study Area.

6.1.4 Water Quality Impacts

The projects considered for construction within the Study Area have the potential to affect water quality, primarily through actions that would result in increased stormwater runoff through expanded impervious surface area. It is also possible that water quality impacts could occur due to additional contaminant loading via stormwater or via projects that may affect water temperatures.

Salmonids and rockfish species could be adversely impacted by potential water quality effects resulting from airport activities. Water quality impacts are not expected to directly affect killer whale or bird species evaluated in this document. With the implementation of appropriate BMPs, the likelihood of adverse effects to water quality would be expected to be minimized. Without implementation of BMPs to control stormwater runoff and erosion from disturbed construction sites, excavation, fill, and vegetation removal could result in increased turbidity and sedimentation in the receiving streams.

6.2 Indirect Effects

Some of the development activities that may occur at STIA or other Port-owned property within the Study Area may result in indirect effects. Water quality of streams within the

Study Area may be indirectly affected by impervious stormwater runoff (see Section 6.2.1), or projects within the Study Area could impact prey resources for listed species (see Section 6.2.2).

6.2.1 Impervious Surfaces and Stormwater Flow

Construction of projects within the Study Area could result in an expansion of the amount of impervious surfaces on airport properties through creation of new roofs, new parking areas, or roadways. Additional impervious surface area has the potential to increase stormwater runoff rates and volumes, and add to the pollutant loads of receiving streams if not properly managed. Impervious surfaces may also trigger flooding, erosion, and degradation of instream habitat and water quality.

For any particular project that necessitates additional impervious surface area, the Port would need to address the potential impact of the increased impervious surface area relative to the watershed, and consider stormwater treatment actions or alternative stormwater management approaches (e.g., reuse) to minimize pollutant inputs to and loading of streams that lead to Puget Sound.

With appropriate BMPs and stormwater mitigation measures in place, the impact of any new impervious surfaces may be managed to minimize the potential for adverse effects to ESA-listed species. Stormwater detention facilities would reduce peak storm event flows from the new developments, reducing the likelihood of bank and channel erosion and protecting habitat in the receiving waters.

During the process of permitting stormwater discharges into Puget Sound or waterways with designated salmonid critical habitat, detectable concentrations of elements such as copper and zinc from stormwater, or other water quality contaminants, may trigger additional compliance requirements as a result of updated water quality parameters and ESA consultations on stormwater permits.

6.2.2 Prey Availability

Projects within the Study Area could impact prey resources for listed species. Proposed projects that impact riparian vegetation near the estuaries of Des Moines or Miller creeks could alter insect productivity, which may in turn impact listed salmonids species. Impacts to Chinook salmon that may affect local populations could in turn impact killer whale, as Chinook salmon compose a large portion of their diet.

Increased development within the Study Area may result in impacts to habitat through alteration of foraging opportunities as a result of decreased prey availability. While impacts to prey availability may occur, they are not likely to rise to the level of take for listed species found within the Study Area.

6.3 Avoidance and Minimization Measures

6.3.1 Best Management Practices

As previously mentioned in this report, development at STIA and on Port-owned properties within the Study Area would implement standard construction BMPs as part of the compliance requirements for other permits, including but not limited to building permits, grading permits, CWA Section 404(b)(1) permits, CWA Section 401 Water Quality permits, or General Stormwater construction permits. The BMPs for any development project would be included as part of the proposed action in an ESA consultation process as a conservation measure (i.e., action to mitigate impacts to ESA-listed species) to avoid and minimize project impacts on species, habitats, and waterways. The 2007 STIA CDP BA (Herrera 2007) provides an overview of the types of BMPs that would be relevant for the types of construction activities likely to occur within the Study Area.

BMPs and conservation measures should be developed to control runoff from new impervious surfaces to avoid increasing pollutant loads to nearby Des Moines Creek, Miller Creek, and associated tributaries that lead to Puget Sound. Additional stormwater detention ponds or alternative considerations for stormwater management (e.g., on-site management and re-use) could reduce the need for additional storage area relative to new impervious surface area. For example, the Port may want to consider low impact development stormwater management approaches as part of the SAMP, such as on-site water reuse to

minimize the impacts to ESA-listed species and habitats, and potentially costs associated with stormwater management improvements.

Future projects would be expected to have specific BMPs that will be considered as part of the proposed action for the purposes of ESA consultation. For example, all projects requiring excavation or ground-disturbing activities would likely require development and implementation of a Temporary Erosion and Sediment Control Plan and Spill Prevention, Control, and Countermeasures Plan. For projects that occur adjacent to or within streams, additional minimization measures would be implemented to protect nearby surface waters, and implementation of advanced construction stormwater treatment BMPs would ensure NPDES permit discharge requirements are met.

6.3.2 Compensatory Mitigation

The Port has implemented compensatory mitigation projects within the Study Area where appropriate, and this practice is expected to continue. Within the Study Area, a wetland mitigation area currently exists along the west side of the STIA runways. The Port has acquired the golf course to the south of STIA, which may provide an opportunity as a mitigation site (Maney, pers. comm. 2014). The development of mitigation areas and planting plans for sites within the airport operating area (STIA and adjacent parcels) must be consistent with the Wildlife Hazard Management Plan landscaping and vegetation requirements.

7 ADDITIONAL ESA CONSIDERATIONS

Based on new ESA polices from USFWS and NMFS (the Services) and recent interactions with those agencies, there are potential trends in the way future ESA consultations could occur. This section provides information on two recent trends that could affect Port ESA consultations.

7.1 Economic Analysis for Critical Habitat Designations

Under the ESA, the Services designate critical habitat for each listed species; these are areas that are important for the species' conservation and recovery. In making these designations, the Services must consider the economic impacts, the impacts on national security, and other relevant impacts, in addition to the benefits to the species. On October 30, 2013, USFWS and NMFS adopted a final rule adopting an "incremental" approach to preparing an economic impact analysis required for a critical habitat designation under the ESA (USFWS 2014e). The change in approach to the economic impact analysis of designating critical habitat may support the exclusion from critical habitat of Port-owned property, particularly property currently in use for airport operations.

Previously, the Services first proposed critical habitat and then subsequently evaluated the economic impacts of that proposed designation. After soliciting public comments on both of those actions, the critical habitat designation was finalized. This rule changes the timing of when the economic analysis is conducted and made available; it will now be made public at the same time as the proposal for designating critical habitat. This revised regulation will require that the draft economic analysis for proposed designations of critical habitat be made available for public review and comment concurrent with the publication of the proposed critical habitat designation.

The revised regulation also codifies the Services' standard practice, in most cases, of using an "incremental approach" for assessing the probable impacts of proposed critical habitat designations and weighing the benefits of including or excluding particular areas from the designations. By this method, the impacts of adding or excluding areas of critical habitat are analyzed separate from all other protections for that species under the ESA. Publishing a proposed critical habitat rule and making available the associated economic analysis at the

same time means that the Services will need to spend more time analyzing and understanding the economic impacts of designating critical habitat before making the proposal public. However, public stakeholders will have more information at the time they are reviewing critical habitat proposals.

7.2 ESA Cumulative Effects

Cumulative effects under the ESA are effects of future state or private activities that are reasonably certain to occur within the action area of an individual project. These are projects that do not have a federal nexus and therefore do not have a mechanism to trigger an ESA consultation process.

Based on recent discussions with representatives from USFWS and NMFS (O'Haleck et al., pers. comm. 2014), during ESA consultations, additional emphasis is expected to be placed on how a project could impact listed species in the project's action area when cumulative effects that result in degraded environmental baseline conditions are present. For example, if the Port were to develop an improved stormwater system that would discharge into a waterbody that is listed on Ecology's 303(d) list, the ESA consultation may need to consider whether the receiving body would be further degraded as a result of the new stormwater discharge even if the discharge from the Port meets all applicable water quality discharge criteria. Under this scenario, the Port could meet or exceed pollutant loading and concentration criterion for stormwater leaving the site, but increases in pollutant loading or concentrations in the receiving water as a whole could result in adverse impacts to listed species (in this scenario, primarily fish species). Therefore, these impacts to the receiving waters could result in a take of listed species under ESA, even though the stormwater discharge from the Port alone would not be considered to result in a take.

8 ESA SPECIES AND EFFECTS SUMMARY

Much like the evaluation of wildlife habitat to avoid airline bird strikes, developing a knowledge base of where ESA-listed species may forage, nest, or travel relative to STIA and Port-owned properties is important information that the Port can use to identify opportunities in advance to avoid habitat impacts where possible. As noted in Section 3, there are no currently listed or proposed species that are found within the upland portions of the Study Area, although the potential for streaked horned lark presence can't be entirely discounted. The presence of listed salmonids species as well as larval and juvenile life stages of certain listed rockfish species in Puget Sound is presumed to occur due to known species habitat preferences. There are several terrestrial species proposed for listing where additional information is being gathered about the species presence in Western Washington; however, as described in Section 3, a review of species life history information and habitat preferences determined that in almost all cases it is expected that suitable habitat for these species is not present at the airport.

The following sections provide a brief overview of the ESA-listed species that have been identified as the most likely to be subject to construction-related project impacts for development activities occurring within the Study Area.

8.1.1 Salmonids

ESA-listed salmonid presence—including Puget Sound evolutionarily significant unit (ESU) Chinook salmon, Puget Sound distinct population segment (DPS) steelhead, and Coastal-Puget Sound DPS bull trout—is noted in the waters of Puget Sound offshore of King County. Near the Study Area, the juvenile life stage for these three salmonids species is most likely to occur in nearshore areas associated with the estuaries of Des Moines Creek and Miller Creek. Non-natal adults (i.e., fish originating from streams outside the Study Area) may be present in the nearshore habitat of these estuaries (Beamer et al. 2013).

Critical habitat is designated for Puget Sound ESU Chinook salmon and Coastal-Puget Sound DPS bull trout. Critical habitat was proposed for Puget Sound DPS steelhead in 2013. It is expected that the final designation of Puget Sound DPS steelhead critical habitat will occur in 2014, and is likely to significantly overlap with critical habitat for Puget Sound ESU

Chinook salmon. Critical habitat for these salmonid species is limited to the nearshore/estuarine areas associated with Miller Creek and Des Moines Creek.

Projects that result in anticipated or unanticipated discharges or runoff directed to Puget Sound via creeks within the Study Area may impact juvenile salmonids through increases in deleterious concentrations of chemicals such as copper or zinc, or other contaminants found in stormwater runoff. Negative water quality impacts to the creeks within the Study Area may affect prey availability for juvenile salmonids foraging in nearshore estuarine areas.

8.1.2 Rockfish

Two listed rockfish species—canary rockfish and bocaccio—may be found in nearshore waters of Puget Sound offshore of King County. Near the Study Area, the larval or juvenile life stage is most likely to occur in the nearshore zone. Larval rockfish are found in surface waters, and subject to drift by wind and wave currents. Juveniles may also be found within the nearshore zone, but adults are most commonly found in much deeper waters and are unlikely to be close to the estuary zones associated with Des Moines Creek and Miller Creek.

Juvenile bocaccio have not been documented within the Puget Sound region; however, most surveys were conducted after populations were already very low (75 FR 22276). However, based on the depth, substrate preferences, and geographical range information associated with juvenile bocaccio, they could occur in these nearshore areas. Proposed critical habitat for rockfish in the Study Area is limited to the nearshore/estuarine areas associated with Miller Creek and Des Moines Creek.

Projects that result in anticipated or unanticipated discharges or runoff directed to Puget Sound may impact larval rockfish species. The larval rockfish is likely particularly sensitive to stormwater runoff that may affect concentrations of contaminants in the surface water microlayer (Herrera and Watershed Company 2011). It is unlikely that project-related discharges to Puget Sound would impact juvenile or adult listed rockfish species because their habitat requirements would locate them farther offshore in deeper waters of Puget Sound.

8.1.3 Streaked Horned Lark

The streaked horned lark has not been documented to occur at STIA or in the Study Area based on information available from USFWS (2014c). However, it has been identified foraging and nesting in the open grasslands of Joint Base Lewis-McChord, Olympia Airport, and Portland Airport and prefers open grassland habitat that is now commonly associated with maintained grass areas associated with airport runways (USFWS 2014c). Ongoing maintenance of this habitat may both injure individuals that may be foraging or nesting in this habitat, while at the same time maintaining the suitability of this habitat for ongoing use by streaked horned lark.

USFWS designated critical habitat for streaked horned lark in 2013 at sites such as airports and agricultural fields where the presence of streaked horned lark is the result of activities (such as runway landscape maintenance) that are unrelated to habitat for streaked horned lark or wildlife in general. The streaked horned lark critical habitat designation included a special 4(d) rule for airports that allows ongoing airport maintenance activities to continue that may result in attraction of the species to airport sites, and then present a resulting nuisance for the Port.

The Port is actively managing lands to reduce wildlife (bird) usage—such as obtaining the golf course and using it as a mitigation site that reduces the amount of open green space and open water that attract migratory bird species and other wildlife. While USFWS has indicated they would work with airports or other property owners to protect streaked horned lark, there is conflicting information regarding what that would mean, and it is not clear that managing airports, farm lands, and dredge spoil disposal areas for streaked horned lark habitat would prove to be a foundation of a long-term recovery strategy.

8.1.4 Species and Project Effects Matrix

Based on the development of the Study Area, evaluation of project effects, and identification of ESA species presence, Table 4 demonstrates the most likely species to be affected by various development and construction projects at STIA in the next 5 to 10 years, and which types of project effects are of most concern for that species.

Table 4

General/Potential Project Effects to Listed Species

Species	Construction-Related Noise		Water Quality			Habitat Fragmentation and Vegetation Clearing
	In-air	In-water	Pollutants/ Stormwater Discharge	Water Temperature	Turbidity	
Puget Sound Chinook salmon			X	X	X	X
Puget Sound steelhead			X	X	X	X
Coastal-Puget Sound bull trout			X	X	X	X
Yelloweye rockfish			X	X	X	
Canary rockfish			X	X	X	
Bocaccio			X	X	X	
Streaked horned lark	Unknown[1]					X

Notes:

1 Due to the recent listing of streaked horned lark, USFWS has not provided guidance to date as to how to address in-air construction noise effects for this species.

9 CONSIDERATIONS FOR SUSTAINABLE AIRPORT MASTER PLAN

9.1 Integrating ESA Species Review into Master Planning Process

Although ESA-listed species presence or designated species critical habitat presence does not occur at STIA, there are linkages to ESA-listed species and critical habitat based on STIA operations as well as potential development projects within the broader Study Area evaluated in this document. As a result, the Port's master planning process should consider how current land use and land use management activities, as well as future development activities, may be approached to minimize impacts to listed species and promote habitat improvements where possible. For example, the sustainable master plan could identify strategies or opportunities to enhance stormwater management, which could reduce or control potential discharge to Puget Sound to support the protection of listed fish species. The sustainable master planning process may also consider land use planning goals that include appropriately located wildlife corridors around wetlands and along riparian zones that would support healthy ecosystems that provide a variety of services in support of listed species other sensitive species, and for the wellbeing of the local community. The Airport Wildlife Hazard Management Plan may be revised to provide consideration of mitigation strategies that balance wildlife and ecosystem needs with aviation safety. For example, wetlands in and adjacent to STIA could potentially be modified to continue to provide some level of ecological service and function while reducing their attractiveness to bird species that present wildlife hazards, provided that the potentially impacted functions of the wetlands were able to be offset elsewhere within the same watershed.

The Port is already working with USFWS to understand the potential for streaked horned lark to occur at STIA, and on ways the Port might provide appropriate mitigation when and if the additional development projects for STIA properties are proposed. USFWS is proposing the development of Habitat Conservation Plans (HCPs) for actions that may affect streaked horned lark. The primary objective of the HCP program is to conserve natural communities at the ecosystem level while accommodating compatible land use. The Port may consider development of an agreement with USFWS for all development projects considered as part of the master plan using a decision matrix related to the presence of suitable streaked horned lark habitat. For example, if streaked horned lark habitat is determined not to be present outside of the runway landscaped areas, then the project will

have "no effect" on streaked horned lark. For projects that occur within STIA and may result in development that removes existing grassland open space, then an evaluation of the potential impacts of the proposed projects on streaked horned lark would occur through a streamlined ESA consultation process.

9.2 Applying Sustainability to ESA Compliance

The Port has an opportunity to contribute to sustainability through the development of the SAMP, and may find opportunities to support and enhance wildlife, ESA species, and ESA species habitats through specific approaches for airport operations and maintenance and future planned development. The following are examples of potential opportunities the Port may consider:

- Develop site grading protocols for stockpiles to prevent these stockpiles from being used for nesting by bird species, both those listed under ESA such as streaked horned lark, as well as those protected under MBTA. This will ensure that future use of the stockpile does not result in unanticipated disturbances to species or nests.
- Work with USFWS to develop ongoing maintenance operations practices that are compatible with species such as streaked horned lark while allowing the Port to complete maintenance in an appropriate and timely manner.
- Develop landscape standards that support aquatic ESA species in terms of providing stormwater filtration services that reduce stormwater discharge to Puget Sound.
- Ensure all construction timing is developed to consider minimizing potential species impacts.
- Develop stormwater management processes that re-use water on-site to avoid the need to create additional stormwater management ponds, or stormwater discharges that impact fish-bearing streams or nearshore/estuarine habitats within the Study Area.

In addition, the Port should review other sustainability measures for ways in which these may inadvertently impact ESA-listed species. For example, wind turbines installed for renewable energy sources can affect certain bat and bird species, requiring incidental take permits or Section 7 consultations. Some wind projects have been delayed or stalled under the ESA as a result of species concerns and failure to address the Act's requirements. New

mass transit projects could affect habitat for ESA species through habitat fragmentation or development that introduces new impervious surfaces within a watershed draining to salmonid critical habitat. Thus, those projects represent opportunities for the Port to work with the Services to increase sustainability of various species while also achieving its development objectives.

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ATTACHMENT E

GENERAL CONFORMITY APPLICABILITY ANALYSIS

GENERAL CONFORMITY APPLICABILITY ANALYSIS

Proposed International Arrivals Facility at

Seattle- Tacoma International Airport

April 9, 2015

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GENERAL CONFORMITY APPLICABILITY ANALYSIS
International Arrivals Facility at
SEATTLE-TACOMA INTERNATIONAL AIRPORT

GENERAL CONFORMITY APPLICABILITY ANALYSIS

EXECUTIVE SUMMARY

To proceed with the International Arrivals Facility, the Port will be required to modify the Airport Layout Plan (ALP). Before the FAA can approve the ALP, the proposed project must first be shown to conform to the Washington State Implementation Plan (SIP). Because of the required Federal approval, an air quality evaluation was performed to determine if the project would require a Clean Air Act general conformity determination. Therefore, an emissions inventory was prepared and contrasted with the de-minimis levels for a maintenance area (the designation applied to the portion of King County where Seattle-Tacoma International Airport is located). As this paper shows, the emissions from the proposed International Arrivals Facility would be below the Clean Air Act defined de-minimis thresholds, and thus indicates that no further analysis is required.

TABLE 1
Project-Related Emissions (tons per year)

	CO	Below De minimis?
Construction (year 1)	18.3	Yes
Construction (year 2)	40.6	Yes
Construction (year 3)	28.8	Yes
De-minimis threshold	100	

Note: Assumed a linear distribution of emissions over a 28 month construction period

INTRODUCTION

The Clean Air Act Amendments of 1990 require Federal agencies to ensure that their actions conform to the appropriate State Implementation Plan (SIP). The SIP is a plan that provides for implementation, maintenance, and enforcement of the National Ambient Air Quality Standards (NAAQS), and includes emission limitations and control measures to attain and maintain the NAAQS. Conformity is defined as demonstrating that a project conforms to the State Implementation Plan's purpose of eliminating or reducing the severity and number of violations of the ambient air quality standards and achieving expeditious attainment of such standards.

Federally funded projects not governed by the Transportation Conformity regulations are subject to the "General Conformity" regulations (40 CFR Part 93, Subpart B). The completion of the International Arrivals Facility will not use Federal Transit or Federal Highway Administration funding nor will it affect public roadways. General Conformity applies to these FAA projects occurring in non-attainment and maintenance areas for any of the criteria pollutants.

In the fall of 1996, the Puget Sound was re-designated as a maintenance area for carbon monoxide (CO) and 1-hour ozone. In June 2005, the EPA rescinded the 1-hour ozone standard. Therefore, the conformity applicability analysis for the International Arrivals Facility is required to focus on CO.

A general conformity determination is required for a project proposed to be located in a maintenance area if the project's total direct or indirect emissions would equal or exceed the annual *de minimis* emissions levels in 40 CFR 93.153. Because the Puget Sound Region is a maintenance area for CO, the applicable *de minimis* emission levels are 100 tons per year. If the project's total direct and indirect emissions meet or exceed these levels, a general conformity determination is required, including the requisite air quality analyses. Total direct and indirect emissions are the sum of the emissions increases and decreases from the proposed action, or the "net" change in emissions anticipated to occur as a result of the proposed project. Therefore, a conformity determination is not required if the differences in emissions with the proposed action, as compared with not taking the action (the Do-Nothing/No-Build alternative), are below the applicable *de minimis* levels.

PROPOSED PROJECT

The international arrivals facilities at Seattle-Tacoma International Airport are located in the South Satellite (SSAT). These facilities originally constructed in 1973, have reached capacity and need to be expanded or replaced. A study in 2013, looking at various alternatives, recommended a new International Arrivals Facility serving the existing South Satellite gates coupled with the continued and expanded use of existing gates on Concourse A for international departures. Any domestic operations that would be displaced by the increased international departure use of Concourse A would be adsorbed within the existing gates. No new gates would be completed on Concourse A for this project.

The Port of Seattle, Seattle-Tacoma International Airport, is proposing the construction of a new landside facility - the International Arrivals Facility (IAF). The International Arrivals Facility will consist of three primary building components: a bridge connecting the existing SSAT to the A Concourse, a sterile corridor and vertical circulation cores on Concourse A, and a new International Arrivals Facility/Federal Inspection Services (FIS) facility. The International Arrivals Facility would be located adjacent and connected to Concourse A and have a footprint of ~181,584 square feet or ~360,344 gross square feet. The International Arrivals Facility would house multiple Department of Homeland Security agency facilities and facilitate the movement of international passengers. The proposed project would not expand overall airport capacity, create new gates, or change the existing aircraft fleet mix, and there would be no new access to airport roadways as a result of this project.

The proposed project would include the following elements:

- Construction of a new International Arrivals Facility/Federal Inspection Services facility east and connected to Concourse A;
- Construction of an elevated sterile corridor and vertical circulation core west and connected above Concourse A;
- Construction of an elevated pedestrian bridge from the South Satellite to the Concourse A sterile corridor;
- Modification of existing aircraft parking layout (i.e. no new gates) at Concourse A (4 to 8 widebody positions) and South Satellite (10 to 12 widebody positions) to accommodate widebody aircraft;
- Temporary relocation of the South Ground Transportation Lot during construction; and

- Pursuit of United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Silver certification for the facility.

The project is slated to begin construction in second quarter 2016 with the facility complete in 2018 and operational in 2019.

ANALYSIS YEARS

Conformity requires the consideration of the following cases (40 CFR 93.183):

(1) The year mandated by the Clean Air Act amendments for attainment by the region or the farthest year for which emissions are projected in the maintenance plan;

(2) The year in which the total direct and indirect emissions from the project are greatest; and

(3) Any year for which the applicable SIP specifies an emissions budget.

Consideration was given to defining the years of analysis for this applicability evaluation in accord with these provisions.

- Attainment year: The year mandated by the Clean Air Act for attainment by the King County portion of Washington State or the year furthest projected in the Maintenance Plan (approved by EPA in 2004) is year 2016.
- Peak project-related emissions: An evaluation was undertaken for this applicability analysis to determine the year in which the total direct and indirect emissions would be greatest from the International Arrivals Facility project. This analysis showed that project-related emissions would be greatest during construction, as no measureable change in criteria pollutant emissions are expected once operational.
- SIP emissions budgets: no emission budget are identified in the maintenance plans

Based on the above years, the analysis considered conditions during the each year of construction, estimated to occur in 2016 through 2018.

EVALUATION METHODOLOGY

Two forms of emissions were evaluated for the proposed project: emissions during construction of the International Arrivals Facility. The following identify the methodologies associated with each evaluation:

1) Construction Emissions

Construction emissions were calculated using representative emission factors, estimates of the equipment that would likely be used in constructing the proposed improvements, and equipment use duration. Construction-related emissions were calculated for:

- Construction employees moving to and from the site;
- Movement of materials and supplies to the construction site;

- Site preparation (non-road construction equipment); and
- International Arrivals Facility and bridge building (non-road construction equipment).

Construction emissions were estimated using ACRP Report 102 *Guidebook for Estimating Airport Construction Emissions* and its associated electronic tool. Appendix A lists the equipment assumptions. The estimates were prepared using default project assumptions noted in the tool which were then adjusted based on two specific estimates for the IAF. These adjustments reflected the cost of the proposed IAF (which largely influences the estimates of construction employees and work commute), as well as estimates for work associated with concrete, pavement, and crane use (which will be needed to erect the IAF bridge between the South Satellite and the new IAF processor adjacent to Concourse A). Appendix A contains the detailed assumptions input to the ACRP Report 102 tool (ACEIT).

It is anticipated that the proposed project construction would occur over a 270 day construction year, about 16 hours a day, 7–days a week.

2) On-going Operational Emissions

The proposed project would result in a slight increase in building electrical consumption. However, these emissions would be created off-site. Thus, they are not included in the general conformity applicability analysis

EMISSIONS INVENTORY

Based on the anticipated International Arrivals Facility and associated project construction plans, a construction emissions estimate was prepared. **Table 2** shows a summary of that estimate.

TABLE 2

Peak Year Carbon Monoxide Construction Emissions (2017)

	CO (tons per year)
International Arrivals Facility	
Non-Road	5.2
On-Road (Employee and material delivery)	35.4
Fugitive	<0.1
SubTotal	40.6

Use of ACEIT – See Appendix A.

The emissions identified in **Table 2** reflect the peak construction year. **Appendix A** shows the equipment mix that was assumed to occur with the proposed construction and the associated emissions.

CONCLUSION

As the revised analysis reflected in **Table 1** shows, the project will not result in emissions that would equal or exceed the applicable de minimis threshold rates and therefore, no additional analysis is required.

APPENDIX A

CONSTRUCTION EMISSIONS EVALUATION

Airport Construction Emissions Inventory Tool (ACEIT)
Version 1.0
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STUDY

Study Name

SEA IAF

Study Description

IAF 2016-2018

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EMISSIONS INVENTORY - SUMMARY

Total Emissions by Year
Units for Non-Greenhouse Gases Emission: Short Ton
Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton

Year	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
2016	18.26117	6.068786	0.027346	0.445488	0.286755	1.063717	1992.911	0.167384	0.009531
2017	40.63508	17.11507	0.111553	1.302993	0.81406	4.607554	8527.037	0.85793	0.048944
2018	28.83665	4.997417	0.063515	0.347785	0.240607	2.233491	4376.314	0.468047	0.038989

Total Emissions by Source Categories
Units for Non-Greenhouse Gases Emission: Short Ton
Units for Greenhouse Gases Emission: Metric Ton

Year	Emission S	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
2016	NonRoad	1.539175	5.260619	0.01565	0.274708	0.252731	0.518077	1380.236	--	--
2016	OnRoad	16.722	0.808167	0.011696	0.03658	0.034024	0.54564	612.6746	0.167384	0.009531
2016	Fugitive	0	0	0	0.1342	--	0	--	--	--
2016	TOTAL	18.26117	6.068786	0.027346	0.445488	0.286755	1.063717	1992.911	0.167384	0.009531
2017	NonRoad	5.223769	13.61333	0.039965	0.800933	0.736859	1.725063	4731.218	--	--
2017	OnRoad	35.37502	3.499472	0.071171	0.083328	0.077201	2.324917	3795.82	0.85793	0.048944
2017	Fugitive	0.0363	0.002266	0.000417	0.418731	--	0.557574	--	--	--
2017	TOTAL	40.63508	17.11507	0.111553	1.302993	0.81406	4.607554	8527.037	0.85793	0.048944
2018	NonRoad	1.311227	3.706827	0.008535	0.198677	0.182783	0.532123	1470.808	--	--
2018	OnRoad	27.52543	1.29059	0.05498	0.062779	0.057824	1.701367	2905.506	0.468047	0.038989
2018	Fugitive	0	0	0	0.086329	--	0	--	--	--
2018	TOTAL	28.83665	4.997417	0.063515	0.347785	0.240607	2.233491	4376.314	0.468047	0.038989

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EMISSIONS INVENTORY - DETAILS:

Non-Road Sources
Units for Non-Greenhouse Gases Emission: Short Ton
Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton

Scenario ID	Year	Project	Constructic	Equipment	Fuel	HP	Averag	Load Factc	Hours of A	CO	NOx	SO2	PM10	PM2.5	VOC	CO2
1	2016	Building - 1	Concrete F	Backhoe	Diesel	100		0.21	480	0.059579	0.048227	8.60E-05	0.008706	0.008009	0.01013	6.988044
1	2016	Building - 1	Concrete F	Concrete F	Diesel	11		0.43	180	0.004233	0.004715	6.56E-06	0.000469	0.000431	0.00068	0.50078
1	2016	Building - 1	Concrete F	Concrete F	Diesel	600		0.59	360	0.075266	0.200358	0.000751	0.011652	0.01072	0.021509	68.35484
1	2016	Building - 1	Concrete F	Excavator	Diesel	175		0.59	160	0.012189	0.029464	0.000101	0.002827	0.002601	0.003312	8.859442
1	2016	Building - 1	Concrete F	Fork Truck	Diesel	100		0.59	480	0.041885	0.04257	0.000184	0.005083	0.004677	0.00516	16.86904

1	2016	Building - 1	Concrete F	Tool Truck	Diesel	600	0.59	120	0.025089	0.066786	0.00025	0.003884	0.003573	0.007235	22.78495
1	2016	Building - 1	Concrete F	Tractor Tra	Diesel	600	0.59	240	0.050177	0.133572	0.0005	0.007768	0.007146	0.014372	45.56989
1	2016	Building - 1	Constructic	Survey Cre	Diesel	600	0.59	10	0.002091	0.005565	2.08E-05	0.000324	0.000298	0.000692	1.898745
1	2016	Building - 1	Constructic	Tractor Tra	Diesel	600	0.59	4	0.000836	0.002226	8.34E-06	0.000129	0.000119	0.000336	0.759498
1	2016	Building - 1	Roofing	High Lift	Diesel	100	0.59	160	0.013962	0.01419	6.13E-05	0.001694	0.001559	0.001735	5.623014
1	2016	Building - 1	Roofing	Man Lift	Diesel	75	0.21	40	0.003544	0.003825	5.50E-06	0.000511	0.00047	0.000762	0.436443
1	2016	Building - 1	Roofing	Material De	Diesel	600	0.59	60	0.012544	0.033393	0.000125	0.001942	0.001787	0.003666	11.39247
1	2016	Building - 1	Roofing	Tractor Tra	Diesel	600	0.59	40	0.008363	0.022262	8.34E-05	0.001295	0.001191	0.002477	7.594982
1	2016	Building - 1	Roofing	Truck Tow	Diesel	300	0.43	120	0.007532	0.035275	9.47E-05	0.001573	0.001447	0.003328	8.211539
1	2016	Building - 1	Security &	High Lift	Diesel	100	0.59	800	0.069808	0.07095	0.000306	0.008472	0.007794	0.008585	28.11507
1	2016	Building - 1	Security &	Tool Truck	Diesel	600	0.59	800	0.167258	0.445239	0.001668	0.025893	0.023822	0.047679	151.8996
1	2016	Building - 1	Structural S	90 Ton Cra	Diesel	300	0.43	11760	0.738093	3.456919	0.009281	0.154112	0.141783	0.321006	804.7308
1	2016	Building - 1	Structural S	Concrete F	Diesel	11	0.43	60	0.001411	0.001572	2.19E-06	0.000156	0.000144	0.000228	0.166927
1	2016	Building - 1	Structural S	Concrete T	Diesel	600	0.59	60	0.012544	0.033393	0.000125	0.001942	0.001787	0.003666	11.39247
1	2016	Building - 1	Structural S	Fork Truck	Diesel	100	0.59	640	0.055846	0.05676	0.000245	0.006778	0.006235	0.006872	22.49205
1	2016	Building - 1	Structural S	Tool Truck	Diesel	600	0.59	160	0.033452	0.089048	0.000334	0.005179	0.004764	0.009614	30.37993
1	2016	Building - 1	Structural S	Tractor Tra	Diesel	600	0.59	360	0.075266	0.200358	0.000751	0.011652	0.01072	0.021509	68.35484
1	2016	Building - 1	Structural S	Trowel Mac	Diesel	600	0.59	40	0.023018	0.052307	9.19E-05	0.003233	0.002974	0.00382	7.591384
1	2016	Building - 1	Structural S	Truck Tow	Diesel	300	0.43	720	0.045189	0.211648	0.000568	0.009435	0.008681	0.019703	49.26923
2	2017	Building - 1	Concrete F	Backhoe	Diesel	100	0.21	480	0.055108	0.044254	6.61E-05	0.007959	0.007323	0.009392	6.990692
2	2017	Building - 1	Concrete F	Concrete F	Diesel	11	0.43	180	0.004212	0.004567	5.14E-06	0.000444	0.000409	0.000656	0.500856
2	2017	Building - 1	Concrete F	Concrete R	Diesel	600	0.59	360	0.056343	0.158111	0.000564	0.008232	0.007574	0.021042	68.35662
2	2017	Building - 1	Concrete F	Excavator	Diesel	175	0.59	160	0.009555	0.023287	7.57E-05	0.002138	0.001967	0.003145	8.860107
2	2017	Building - 1	Concrete F	Fork Truck	Diesel	100	0.59	480	0.028898	0.028865	0.000137	0.003003	0.002763	0.004829	16.87004
2	2017	Building - 1	Concrete F	Tool Truck	Diesel	600	0.59	120	0.018781	0.052704	0.000188	0.002744	0.002525	0.007199	22.78554
2	2017	Building - 1	Concrete F	Tractor Tra	Diesel	600	0.59	240	0.037562	0.105408	0.000376	0.005488	0.005049	0.014121	45.57108
2	2017	Building - 1	Constructic	Survey Cre	Diesel	600	0.59	10	0.001565	0.004392	1.57E-05	0.000229	0.00021	0.000855	1.898795
2	2017	Building - 1	Constructic	Tractor Tra	Diesel	600	0.59	4	0.000626	0.001757	6.26E-06	9.15E-05	8.42E-05	0.000509	0.759518
2	2017	Building - 1	Exterior Wa	Fork Truck	Diesel	100	0.59	840	0.050572	0.050513	0.00024	0.005256	0.004835	0.00841	29.52257
2	2017	Building - 1	Exterior Wa	Generator	Diesel	40	0.43	80	0.002429	0.006734	7.73E-06	0.000466	0.000429	0.000659	0.810598
2	2017	Building - 1	Exterior Wa	Grout Mixe	Diesel	600	0.59	420	0.21677	0.498919	0.000742	0.030618	0.028168	0.03671	79.71645
2	2017	Building - 1	Exterior Wa	Grout Whe	Diesel	600	0.59	160	0.025042	0.070272	0.000251	0.003659	0.003366	0.009507	30.38072
2	2017	Building - 1	Exterior Wa	Man Lift	Diesel	75	0.21	1680	0.139727	0.154418	0.000178	0.019889	0.018298	0.028934	18.33683
2	2017	Building - 1	Exterior Wa	Tool Truck	Diesel	600	0.59	420	0.065734	0.184463	0.000658	0.009605	0.008836	0.024503	79.74939
2	2017	Building - 1	Exterior Wa	Tractor Tra	Diesel	600	0.59	840	0.131468	0.368926	0.001316	0.019209	0.017672	0.048728	159.4988
2	2017	Building - 1	Exterior Wa	Truck Tow	Diesel	300	0.43	80	0.004311	0.019901	4.79E-05	0.000886	0.000815	0.002225	5.474749
2	2017	Building - 1	Interior Bui	Fork Truck	Diesel	100	0.59	1600	0.096328	0.096215	0.000458	0.01001	0.00921	0.015971	56.23346
2	2017	Building - 1	Interior Bui	Man Lift	Diesel	75	0.21	3200	0.266147	0.29413	0.000339	0.037884	0.034854	0.055038	34.9273
2	2017	Building - 1	Interior Bui	Tool Truck	Diesel	600	0.59	1600	0.250415	0.702717	0.002506	0.036589	0.033662	0.092564	303.8072
2	2017	Building - 1	Interior Bui	Tractor Tra	Diesel	600	0.59	1600	0.250415	0.702717	0.002506	0.036589	0.033662	0.092564	303.8072
2	2017	Building - 1	Roofing	High Lift	Diesel	100	0.59	160	0.009633	0.009622	4.58E-05	0.001001	0.000921	0.001646	5.623346
2	2017	Building - 1	Roofing	Man Lift	Diesel	75	0.21	40	0.003327	0.003677	4.24E-06	0.000474	0.000436	0.00077	0.436591
2	2017	Building - 1	Roofing	Material De	Diesel	600	0.59	60	0.009391	0.026352	9.40E-05	0.001372	0.001262	0.003739	11.39277
2	2017	Building - 1	Roofing	Tractor Tra	Diesel	600	0.59	40	0.00626	0.017568	6.26E-05	0.000915	0.000842	0.002585	7.59518
2	2017	Building - 1	Roofing	Truck Tow	Diesel	300	0.43	120	0.006467	0.029852	7.19E-05	0.001329	0.001222	0.003246	8.212123
2	2017	Building - 1	Security &	High Lift	Diesel	100	0.59	800	0.048164	0.048108	0.000229	0.005005	0.004605	0.008012	28.11673
2	2017	Building - 1	Security &	Tool Truck	Diesel	600	0.59	800	0.125208	0.351358	0.001253	0.018294	0.016831	0.046421	151.9036
2	2017	Building - 1	Structural S	90 Ton Cra	Diesel	300	0.43	11572	0.623593	2.878687	0.006935	0.128137	0.117886	0.295455	791.9224
2	2017	Building - 1	Structural S	Concrete F	Diesel	11	0.43	60	0.001404	0.001522	1.71E-06	0.000148	0.000136	0.000223	0.166952
2	2017	Building - 1	Structural S	Concrete T	Diesel	600	0.59	60	0.009391	0.026352	9.40E-05	0.001372	0.001262	0.003739	11.39277
2	2017	Building - 1	Structural S	Fork Truck	Diesel	100	0.59	640	0.038531	0.038486	0.000183	0.004004	0.003684	0.006421	22.49338
2	2017	Building - 1	Structural S	Tool Truck	Diesel	600	0.59	160	0.025042	0.070272	0.000251	0.003659	0.003366	0.009507	30.38072
2	2017	Building - 1	Structural S	Tractor Tra	Diesel	600	0.59	360	0.056343	0.158111	0.000564	0.008232	0.007574	0.021042	68.35662
2	2017	Building - 1	Structural S	Trowel Mac	Diesel	600	0.59	40	0.020645	0.047516	7.07E-05	0.002916	0.002683	0.003952	7.592043
2	2017	Building - 1	Structural S	Truck Tow	Diesel	300	0.43	720	0.038799	0.179109	0.000431	0.007973	0.007335	0.018555	49.27274
2	2017	Building - 3	Concrete F	Backhoe	Diesel	100	0.21	320.1	0.03675	0.029512	4.41E-05	0.005308	0.004883	0.006364	4.661918
2	2017	Building - 3	Concrete F	Concrete R	Diesel	600	0.59	60	0.009391	0.026352	9.40E-05	0.001372	0.001262	0.003739	11.39277
2	2017	Building - 3	Concrete F	Fork Truck	Diesel	100	0.59	320.1	0.019272	0.019249	9.16E-05	0.002003	0.001843	0.003238	11.25021
2	2017	Building - 3	Concrete F	Tool Truck	Diesel	600	0.59	80.1	0.012536	0.03518	0.000125	0.001832	0.001685	0.004898	15.20935
2	2017	Building - 3	Concrete F	Tractor Tra	Diesel	600	0.59	15.9	0.002489	0.006983	2.49E-05	0.000364	0.000335	0.001195	3.019084
2	2017	Building - 3	Constructic	Survey Cre	Diesel	600	0.59	9.9	0.001549	0.004348	1.55E-05	0.000226	0.000208	0.000849	1.879807
2	2017	Building - 3	Constructic	Tractor Tra	Diesel	600	0.59	3.9	0.00061	0.001713	6.11E-06	8.92E-05	8.21E-05	0.000503	0.74053
2	2017	Building - 3	Exterior Wa	Fork Truck	Diesel	100	0.59	600	0.036123	0.036081	0.000172	0.003754	0.003454	0.006023	21.08755
2	2017	Building - 3	Exterior Wa	Generator	Diesel	40	0.43	300	0.009108	0.025254	2.90E-05	0.001747	0.001607	0.002409	3.039743

2	2017	Building - 3	Exterior Wa	Man Lift	Diesel	75	0.21	600	0.049903	0.055149	6.37E-05	0.007103	0.006535	0.010387	6.548868	
2	2017	Building - 3	Exterior Wa	Tool Truck	Diesel	600	0.59	150	0.023476	0.06588	0.000235	0.00343	0.003156	0.00893	28.48192	
2	2017	Building - 3	Exterior Wa	Tractor Tra	Diesel	600	0.59	150	0.023476	0.06588	0.000235	0.00343	0.003156	0.00893	28.48192	
2	2017	Building - 3	Interior Bui	Fork Truck	Diesel	100	0.59	2400	0.144492	0.144323	0.000687	0.015016	0.013814	0.023929	84.35019	
2	2017	Building - 3	Interior Bui	Man Lift	Diesel	75	0.21	2400	0.19961	0.220598	0.000255	0.028413	0.02614	0.041299	26.19547	
2	2017	Building - 3	Interior Bui	Tool Truck	Diesel	600	0.59	300	0.046953	0.131759	0.00047	0.00686	0.006312	0.017582	56.96385	
2	2017	Building - 3	Interior Bui	Tractor Tra	Diesel	600	0.59	600	0.093906	0.263519	0.00094	0.013721	0.012623	0.034885	113.9277	
2	2017	Building - 3	Roofing	High Lift	Diesel	100	0.59	120	0.007225	0.007216	3.43E-05	0.000751	0.000691	0.001248	4.21751	
2	2017	Building - 3	Roofing	Man Lift (F	Diesel	75	0.21	24	0.001996	0.002206	2.55E-06	0.000284	0.000261	0.000495	0.261955	
2	2017	Building - 3	Roofing	Material De	Diesel	600	0.59	60	0.009391	0.026352	9.40E-05	0.001372	0.001262	0.003739	11.39277	
2	2017	Building - 3	Roofing	Tractor Tra	Diesel	600	0.59	60	0.009391	0.026352	9.40E-05	0.001372	0.001262	0.003739	11.39277	
2	2017	Building - 3	Security &	High Lift	Diesel	100	0.59	800.1	0.04817	0.048114	0.000229	0.005006	0.004605	0.008013	28.12025	
2	2017	Building - 3	Security &	Tool Truck	Diesel	600	0.59	200.1	0.031318	0.087884	0.000313	0.004576	0.00421	0.01182	37.99489	
2	2017	Building - 3	Structural S	90 Ton Cra	Diesel	300	0.43	320.1	0.01725	0.079629	0.000192	0.003544	0.003261	0.008351	21.90584	
2	2017	Building - 3	Structural S	Concrete P	Diesel	11	0.43	12	0.000281	0.000304	3.43E-07	2.96E-05	2.73E-05	5.00E-05	0.03339	
2	2017	Building - 3	Structural S	Concrete T	Diesel	600	0.59	24	0.003756	0.010541	3.76E-05	0.000549	0.000505	0.001662	4.557108	
2	2017	Building - 3	Structural S	Fork Truck	Diesel	100	0.59	80.1	0.004822	0.004817	2.29E-05	0.000501	0.000461	0.000851	2.815188	
2	2017	Building - 3	Structural S	Tool Truck	Diesel	600	0.59	12	0.001878	0.00527	1.88E-05	0.000274	0.000252	0.00097	2.278554	
2	2017	Building - 3	Structural S	Tractor Tra	Diesel	600	0.59	39.9	0.006245	0.017524	6.25E-05	0.000912	0.000839	0.002579	7.576192	
2	2017	Building - 3	Structural S	Trowel Ma	Diesel	600	0.59	12	0.006193	0.014255	2.12E-05	0.000875	0.000805	0.001538	2.277613	
2	2017	Cargo Aprc	Asphalt Pla	Asphalt Pa	Diesel	175	0.59	117.104	0.009337	0.022397	5.75E-05	0.002172	0.001998	0.002623	6.483963	
2	2017	Cargo Aprc	Asphalt Pla	Dump Truc	Diesel	600	0.59	421.758	0.066009	0.185235	0.000661	0.009645	0.008873	0.024604	80.08319	
2	2017	Cargo Aprc	Asphalt Pla	Other Gen	Diesel	175	0.43	234.208	0.01094	0.04162	8.52E-05	0.002723	0.002505	0.004157	9.348106	
2	2017	Cargo Aprc	Asphalt Pla	Pickup Tru	Diesel	600	0.59	117.104	0.018328	0.051432	0.000183	0.002678	0.002464	0.007032	22.23565	
2	2017	Cargo Aprc	Asphalt Pla	Roller	Diesel	100	0.59	117.104	0.015453	0.016258	3.68E-05	0.002042	0.001879	0.001798	4.114277	
2	2017	Cargo Aprc	Asphalt Pla	Skid Steer	Diesel	75	0.21	117.104	0.010694	0.010499	1.24E-05	0.001608	0.001479	0.002345	1.277758	
2	2017	Cargo Aprc	Asphalt Pla	Surfacing E	Diesel	25	0.59	149.893	0.006018	0.010866	1.35E-05	0.000871	0.000802	0.001172	1.314852	
2	2017	Cargo Aprc	Clearing ar	Chain Saw	Diesel	11	0.7	4.8	0.011959	5.39E-05	5.71E-06	0.000397	0.000365	0.00979	0.025354	*** GASOLINE DATA USED. DIESEL DATA NOT AVAIL
2	2017	Cargo Aprc	Clearing ar	Chipper/St	Diesel	100	0.43	4.8	0.000473	0.000854	1.16E-06	8.47E-05	7.79E-05	0.000297	0.121586	
2	2017	Cargo Aprc	Clearing ar	Pickup Tru	Diesel	600	0.59	6.4	0.001002	0.002811	1.00E-05	0.000146	0.000135	0.000647	1.215229	
2	2017	Cargo Aprc	Concrete P	Air Compre	Diesel	100	0.43	280.728	0.020588	0.035266	6.52E-05	0.003172	0.002919	0.003631	7.116795	
2	2017	Cargo Aprc	Concrete P	Concrete S	Diesel	40	0.59	280.728	0.006521	0.026872	3.50E-05	0.00104	0.000956	0.001508	3.945517	
2	2017	Cargo Aprc	Concrete P	Concrete T	Diesel	600	0.59	1169.7	0.183069	0.51373	0.001832	0.026749	0.024609	0.067745	222.102	
2	2017	Cargo Aprc	Concrete P	Other Gen	Diesel	175	0.43	561.456	0.026225	0.099775	0.000204	0.006528	0.006006	0.009785	22.40978	
2	2017	Cargo Aprc	Concrete P	Pickup Tru	Diesel	600	0.59	842.184	0.13181	0.369886	0.001319	0.019259	0.017718	0.048854	159.9135	
2	2017	Cargo Aprc	Concrete P	Rubber Tir	Diesel	175	0.59	280.728	0.023999	0.057838	0.000139	0.0056	0.005152	0.006331	15.5431	
2	2017	Cargo Aprc	Concrete P	Slip Form F	Diesel	175	0.59	280.728	0.022384	0.053692	0.000138	0.005207	0.00479	0.006104	15.54371	
2	2017	Cargo Aprc	Concrete P	Surfacing E	Diesel	25	0.59	280.728	0.011271	0.020351	2.53E-05	0.001632	0.001501	0.00219	2.462529	
2	2017	Cargo Aprc	Drainage -	Dozer	Diesel	175	0.59	6.72	0.000475	0.001139	3.24E-06	0.000109	0.000101	0.000261	0.372102	
2	2017	Cargo Aprc	Drainage -	Dump Truc	Diesel	600	0.59	6.72	0.001052	0.002951	1.05E-05	0.000154	0.000141	0.000666	1.27599	
2	2017	Cargo Aprc	Drainage -	Excavator	Diesel	175	0.59	6.72	0.000401	0.000978	3.18E-06	8.98E-05	8.26E-05	0.000241	0.372124	
2	2017	Cargo Aprc	Drainage -	Loader	Diesel	175	0.59	6.72	0.000574	0.001385	3.33E-06	0.000134	0.000123	0.000286	0.372067	
2	2017	Cargo Aprc	Drainage -	Other Gen	Diesel	175	0.43	6.72	0.000314	0.001194	2.44E-06	7.81E-05	7.19E-05	0.000244	0.26822	
2	2017	Cargo Aprc	Drainage -	Pickup Tru	Diesel	600	0.59	6.72	0.001052	0.002951	1.05E-05	0.000154	0.000141	0.000666	1.27599	
2	2017	Cargo Aprc	Drainage -	Roller	Diesel	100	0.59	6.72	0.000887	0.000933	2.11E-06	0.000117	0.000108	0.000203	0.236097	
2	2017	Cargo Aprc	Drainage -	Dump Truc	Diesel	600	0.59	3.733	0.000584	0.00164	5.85E-06	8.54E-05	7.85E-05	0.000493	0.70882	
2	2017	Cargo Aprc	Drainage -	Loader	Diesel	175	0.59	3.733	0.000319	0.000769	1.85E-06	7.45E-05	6.85E-05	0.00022	0.206685	
2	2017	Cargo Aprc	Drainage -	Other Gen	Diesel	175	0.43	3.733	0.000174	0.000663	1.36E-06	4.34E-05	3.99E-05	0.000193	0.148998	
2	2017	Cargo Aprc	Drainage -	Pickup Tru	Diesel	600	0.59	3.733	0.000584	0.00164	5.85E-06	8.54E-05	7.85E-05	0.000493	0.70882	
2	2017	Cargo Aprc	Drainage -	Tractors/Lo	Diesel	100	0.21	3.733	0.000429	0.000344	5.14E-07	6.19E-05	5.69E-05	0.000375	0.054367	
2	2017	Cargo Aprc	Dust Contr	Water Truc	Diesel	600	0.59	2880	0.450747	1.26489	0.00451	0.06586	0.060591	0.166393	546.8529	
2	2017	Cargo Aprc	Excavation	Dozer	Diesel	175	0.59	9.251	0.000654	0.001568	4.47E-06	0.000151	0.000139	0.000312	0.51225	
2	2017	Cargo Aprc	Excavation	Dump Truc	Diesel	600	0.59	9.251	0.001448	0.004063	1.45E-05	0.000212	0.000195	0.000812	1.756575	
2	2017	Cargo Aprc	Excavation	Pickup Tru	Diesel	600	0.59	9.251	0.001448	0.004063	1.45E-05	0.000212	0.000195	0.000812	1.756575	
2	2017	Cargo Aprc	Excavation	Roller	Diesel	100	0.59	4.27	0.000563	0.000593	1.34E-06	7.45E-05	6.85E-05	0.000167	0.15002	
2	2017	Cargo Aprc	Excavation	Dozer	Diesel	175	0.59	6.938	0.00049	0.001176	3.35E-06	0.000113	0.000104	0.000265	0.384174	
2	2017	Cargo Aprc	Excavation	Dump Truc	Diesel	600	0.59	18.501	0.002896	0.008126	2.90E-05	0.000423	0.000389	0.001345	3.51296	
2	2017	Cargo Aprc	Excavation	Excavator	Diesel	175	0.59	5.55	0.000331	0.000808	2.62E-06	7.42E-05	6.82E-05	0.000218	0.307335	
2	2017	Cargo Aprc	Excavation	Pickup Tru	Diesel	600	0.59	5.55	0.000869	0.002438	8.69E-06	0.000127	0.000117	0.000598	1.053831	
2	2017	Cargo Aprc	Excavation	Roller	Diesel	100	0.59	5.55	0.000732	0.000771	1.74E-06	9.68E-05	8.91E-05	0.000186	0.194991	
2	2017	Cargo Aprc	Excavation	Scraper	Diesel	600	0.59	6.938	0.002224	0.005492	1.18E-05	0.000334	0.000307	0.000863	1.317235	
2	2017	Cargo Aprc	Excavation	Dozer	Diesel	175	0.59	2.612	0.000185	0.000443	1.26E-06	4.25E-05	3.91E-05	0.000178	0.144633	
2	2017	Cargo Aprc	Fencing	Concrete T	Diesel	600	0.59	2.222	0.000348	0.000976	3.48E-06	5.08E-05	4.67E-05	0.000406	0.421912	
2	2017	Cargo Aprc	Fencing	Dump Truc	Diesel	600	0.59	8.889	0.001391	0.003904	1.39E-05	0.000203	0.000187	0.000791	1.687839	

2	2017	Cargo Aprc	Fencing	Other Gen	Diesel	175	0.43	8.889	0.000415	0.00158	3.23E-06	0.000103	9.51E-05	0.000282	0.354793
2	2017	Cargo Aprc	Fencing	Pickup Tru	Diesel	600	0.59	8.889	0.001391	0.003904	1.39E-05	0.000203	0.000187	0.000791	1.687839
2	2017	Cargo Aprc	Fencing	Skid Steer	Diesel	75	0.21	8.889	0.000812	0.000797	9.43E-07	0.000122	0.000112	0.00035	0.096991
2	2017	Cargo Aprc	Fencing	Tractors/Lc	Diesel	100	0.21	8.889	0.001021	0.00082	1.22E-06	0.000147	0.000136	0.000473	0.129459
2	2017	Cargo Aprc	Grading	Dozer	Diesel	175	0.59	1.981	0.00014	0.000336	9.56E-07	3.22E-05	2.97E-05	0.000166	0.109693
2	2017	Cargo Aprc	Grading	Grader	Diesel	300	0.59	1.981	0.000162	0.000508	1.58E-06	2.94E-05	2.71E-05	0.000215	0.188059
2	2017	Cargo Aprc	Grading	Roller	Diesel	100	0.59	1.981	0.000261	0.000275	6.23E-07	3.46E-05	3.18E-05	0.000134	0.0696
2	2017	Cargo Aprc	Hydroseed	Hydroseed	Diesel	600	0.59	1.785	0.000279	0.000784	2.80E-06	4.08E-05	3.76E-05	0.000381	0.338935
2	2017	Cargo Aprc	Hydroseed	Off-Road T	Diesel	600	0.59	1.785	0.000279	0.000784	2.80E-06	4.08E-05	3.76E-05	0.000381	0.338935
2	2017	Cargo Aprc	Lighting	Dump Truc	Diesel	600	0.59	3.667	0.000574	0.001611	5.74E-06	8.39E-05	7.71E-05	0.00049	0.696288
2	2017	Cargo Aprc	Lighting	Loader	Diesel	175	0.59	3.667	0.000313	0.000756	1.82E-06	7.31E-05	6.73E-05	0.000218	0.203031
2	2017	Cargo Aprc	Lighting	Other Gen	Diesel	175	0.43	3.667	0.000171	0.000652	1.33E-06	4.26E-05	3.92E-05	0.000192	0.146364
2	2017	Cargo Aprc	Lighting	Pickup Tru	Diesel	600	0.59	3.667	0.000574	0.001611	5.74E-06	8.39E-05	7.71E-05	0.00049	0.696288
2	2017	Cargo Aprc	Lighting	Skid Steer	Diesel	75	0.21	3.667	0.000335	0.000329	3.89E-07	5.04E-05	4.63E-05	0.000254	0.040012
2	2017	Cargo Aprc	Lighting	Tractors/Lc	Diesel	100	0.21	3.667	0.000421	0.000338	5.05E-07	6.08E-05	5.59E-05	0.000374	0.053406
2	2017	Cargo Aprc	Markings	Flatbed Tr	Diesel	600	0.59	34.286	0.005366	0.015058	5.37E-05	0.000784	0.000721	0.002256	6.510208
2	2017	Cargo Aprc	Markings	Other Gen	Diesel	175	0.43	34.286	0.001601	0.006093	1.25E-05	0.000399	0.000367	0.000718	1.368481
2	2017	Cargo Aprc	Markings	Pickup Tru	Diesel	600	0.59	34.286	0.005366	0.015058	5.37E-05	0.000784	0.000721	0.002256	6.510208
2	2017	Cargo Aprc	Sealing/Fu	Distributing	Diesel	600	0.59	4.44	0.000695	0.00195	6.95E-06	0.000102	9.34E-05	0.000534	0.843065
2	2017	Cargo Aprc	Sealing/Fu	Other Gen	Diesel	175	0.43	4.44	0.000207	0.000789	1.61E-06	5.16E-05	4.75E-05	0.000205	0.177217
2	2017	Cargo Aprc	Sealing/Fu	Pickup Tru	Diesel	600	0.59	4.44	0.000695	0.00195	6.95E-06	0.000102	9.34E-05	0.000534	0.843065
2	2017	Cargo Aprc	Soil Erosio	Other Gen	Diesel	175	0.43	1.6	7.47E-05	0.000284	5.82E-07	1.86E-05	1.71E-05	0.000156	0.063862
2	2017	Cargo Aprc	Soil Erosio	Pickup Tru	Diesel	600	0.59	3.2	0.000501	0.001405	5.01E-06	7.32E-05	6.73E-05	0.000463	0.607614
2	2017	Cargo Aprc	Soil Erosio	Pumps	Diesel	11	0.43	1.6	3.74E-05	4.06E-05	4.57E-08	3.95E-06	3.63E-06	1.25E-05	0.004452
2	2017	Cargo Aprc	Soil Erosio	Tractors/Lc	Diesel	100	0.21	1.6	0.000184	0.000148	2.20E-07	2.65E-05	2.44E-05	0.000335	0.023302
2	2017	Cargo Aprc	Subbase P	Dozer	Diesel	175	0.59	3.505	0.000248	0.000594	1.69E-06	5.71E-05	5.25E-05	0.000196	0.19408
2	2017	Cargo Aprc	Subbase P	Dump Truc	Diesel	600	0.59	24.667	0.003861	0.010834	3.86E-05	0.000564	0.000519	0.001701	4.683757
2	2017	Cargo Aprc	Subbase P	Pickup Tru	Diesel	600	0.59	3.505	0.000549	0.001539	5.49E-06	8.02E-05	7.37E-05	0.00048	0.665528
2	2017	Cargo Aprc	Subbase P	Roller	Diesel	100	0.59	3.415	0.000451	0.000474	1.07E-06	5.96E-05	5.48E-05	0.000155	0.119981
2	2017	Cargo Aprc	Topsoil Pla	Dozer	Diesel	175	0.59	4.403	0.000311	0.000746	2.13E-06	7.17E-05	6.59E-05	0.000214	0.243805
2	2017	Cargo Aprc	Topsoil Pla	Dump Truc	Diesel	600	0.59	4.403	0.000689	0.001934	6.90E-06	0.000101	9.26E-05	0.000532	0.836039
2	2017	Cargo Aprc	Topsoil Pla	Pickup Tru	Diesel	600	0.59	4.403	0.000689	0.001934	6.90E-06	0.000101	9.26E-05	0.000532	0.836039
3	2018	Building - 1	Interior Bui	Fork Truck	Diesel	100	0.59	960	0.031824	0.030319	0.000182	0.001846	0.001698	0.008835	33.74207
3	2018	Building - 1	Interior Bui	Man Lift	Diesel	75	0.21	960	0.074631	0.084689	7.16E-05	0.010467	0.00963	0.015265	10.48175
3	2018	Building - 1	Interior Bui	Tool Truck	Diesel	600	0.59	120	0.012474	0.038622	0.000126	0.001604	0.001476	0.006838	22.78613
3	2018	Building - 1	Interior Bui	Tractor Tra	Diesel	600	0.59	120	0.012474	0.038622	0.000126	0.001604	0.001476	0.006838	22.78613
3	2018	Building - 1	Roofing	High Lift	Diesel	100	0.59	120	0.003978	0.00379	2.27E-05	0.000231	0.000212	0.001113	4.217759
3	2018	Building - 1	Roofing	Man Lift (F	Diesel	75	0.21	120	0.009329	0.010586	8.95E-06	0.001308	0.001204	0.001974	1.310219
3	2018	Building - 1	Roofing	Material De	Diesel	600	0.59	8	0.000832	0.002575	8.38E-06	0.000107	9.84E-05	0.000579	1.519076
3	2018	Building - 1	Roofing	Tractor Tra	Diesel	600	0.59	12	0.001247	0.003862	1.26E-05	0.00016	0.000148	0.000803	2.278613
3	2018	Building - 1	Security &	High Lift	Diesel	100	0.59	320	0.010608	0.010106	6.06E-05	0.000615	0.000566	0.002952	11.24736
3	2018	Building - 1	Security &	Tool Truck	Diesel	600	0.59	80	0.008316	0.025748	8.38E-05	0.00107	0.000984	0.004603	15.19076
3	2018	Building - 3	Concrete F	Backhoe	Diesel	100	0.21	320.1	0.033768	0.026863	3.08E-05	0.00481	0.004426	0.005684	4.663685
3	2018	Building - 3	Concrete F	Concrete F	Diesel	600	0.59	60	0.006237	0.019311	6.28E-05	0.000802	0.000738	0.003485	11.39307
3	2018	Building - 3	Concrete F	Fork Truck	Diesel	100	0.59	320.1	0.010611	0.010109	6.06E-05	0.000616	0.000566	0.002953	11.25087
3	2018	Building - 3	Concrete F	Tool Truck	Diesel	600	0.59	80.1	0.008326	0.02578	8.39E-05	0.001071	0.000985	0.004608	15.20974
3	2018	Building - 3	Concrete F	Tractor Tra	Diesel	600	0.59	15.9	0.001653	0.005117	1.67E-05	0.000213	0.000196	0.001021	3.019163
3	2018	Building - 3	Constructic	Survey Cre	Diesel	600	0.59	9.9	0.001029	0.003186	1.04E-05	0.000132	0.000122	0.000685	1.879856
3	2018	Building - 3	Constructic	Tractor Tra	Diesel	600	0.59	3.9	0.000405	0.001255	4.08E-06	5.21E-05	4.80E-05	0.00035	0.740549
3	2018	Building - 3	Exterior Wa	Fork Truck	Diesel	100	0.59	600	0.01989	0.018949	0.000114	0.001154	0.001062	0.005526	21.08879
3	2018	Building - 3	Exterior Wa	Generator	Diesel	40	0.43	300	0.007973	0.024286	2.01E-05	0.001547	0.001423	0.002091	3.040605
3	2018	Building - 3	Exterior Wa	Man Lift	Diesel	75	0.21	600	0.046644	0.052931	4.47E-05	0.006542	0.006018	0.009569	6.551096
3	2018	Building - 3	Exterior Wa	Tool Truck	Diesel	600	0.59	150	0.015592	0.048277	0.000157	0.002005	0.001845	0.008514	28.48267
3	2018	Building - 3	Exterior Wa	Tractor Tra	Diesel	600	0.59	150	0.015592	0.048277	0.000157	0.002005	0.001845	0.008514	28.48267
3	2018	Building - 3	Interior Bui	Fork Truck	Diesel	100	0.59	2400	0.07956	0.075797	0.000454	0.004615	0.004246	0.022073	84.35518
3	2018	Building - 3	Interior Bui	Man Lift	Diesel	75	0.21	2400	0.186577	0.211723	0.000179	0.026167	0.024074	0.03805	26.20438
3	2018	Building - 3	Interior Bui	Tool Truck	Diesel	600	0.59	300	0.031184	0.096554	0.000314	0.004011	0.00369	0.016896	56.96533
3	2018	Building - 3	Interior Bui	Tractor Tra	Diesel	600	0.59	600	0.062368	0.193108	0.000628	0.008022	0.00738	0.03366	113.9307
3	2018	Building - 3	Roofing	High Lift	Diesel	100	0.59	120	0.003978	0.00379	2.27E-05	0.000231	0.000212	0.001113	4.217759
3	2018	Building - 3	Roofing	Man Lift (F	Diesel	75	0.21	24	0.001866	0.002117	1.79E-06	0.000262	0.000241	0.000455	0.262044
3	2018	Building - 3	Roofing	Material De	Diesel	600	0.59	60	0.006237	0.019311	6.28E-05	0.000802	0.000738	0.003485	11.39307
3	2018	Building - 3	Roofing	Tractor Tra	Diesel	600	0.59	60	0.006237	0.019311	6.28E-05	0.000802	0.000738	0.003485	11.39307
3	2018	Building - 3	Security &	High Lift	Diesel	100	0.59	800.1	0.026523	0.025269	0.000151	0.001539	0.001416	0.007365	28.12191
3	2018	Building - 3	Security &	Tool Truck	Diesel	600	0.59	200.1	0.0208	0.064402	0.00021	0.002675	0.002461	0.011314	37.99588

3	2018	Building - 3	Structural S	90 Ton Cra	Diesel	300	0.43	11878	0.534667	2.41801	0.004862	0.107392	0.098801	0.282123	812.9213
3	2018	Building - 3	Structural S	Concrete P	Diesel	11	0.43	12	0.000279	0.000295	2.48E-07	2.80E-05	2.58E-05	4.67E-05	0.033396
3	2018	Building - 3	Structural S	Concrete T	Diesel	600	0.59	24	0.002495	0.007724	2.51E-05	0.000321	0.000295	0.001473	4.557227
3	2018	Building - 3	Structural S	Fork Truck	Diesel	100	0.59	80.1	0.002655	0.00253	1.52E-05	0.000154	0.000142	0.000747	2.815354
3	2018	Building - 3	Structural S	Tool Truck	Diesel	600	0.59	12	0.001247	0.003862	1.26E-05	0.00016	0.000148	0.000803	2.278613
3	2018	Building - 3	Structural S	Tractor Tra	Diesel	600	0.59	39.9	0.004147	0.012842	4.18E-05	0.000533	0.000491	0.002362	7.576389
3	2018	Building - 3	Structural S	Trowel Mac	Diesel	600	0.59	12	0.005481	0.012818	1.48E-05	0.00078	0.000717	0.001399	2.277811
3	2018	Landscapir	Hydroseed	Hydroseed	Diesel	600	0.59	0.66	6.86E-05	0.000212	6.91E-07	8.82E-06	8.12E-06	0.000169	0.125324
3	2018	Landscapir	Hydroseed	Off-Road T	Diesel	600	0.59	0.66	6.86E-05	0.000212	6.91E-07	8.82E-06	8.12E-06	0.000169	0.125324
3	2018	Landscapir	Mulching	Dump Truc	Diesel	600	0.59	0.4	4.16E-05	0.000129	4.19E-07	5.35E-06	4.92E-06	0.000155	0.075954
3	2018	Landscapir	Mulching	Other Gen	Diesel	175	0.43	0.4	1.63E-05	5.96E-05	9.99E-08	4.05E-06	3.73E-06	0.00011	0.015967
3	2018	Landscapir	Mulching	Pickup Tru	Diesel	600	0.59	0.4	4.16E-05	0.000129	4.19E-07	5.35E-06	4.92E-06	0.000155	0.075954
3	2018	Landscapir	Mulching	Tractors/Lo	Diesel	100	0.21	0.4	4.22E-05	3.36E-05	3.85E-08	6.01E-06	5.53E-06	0.000274	0.005828
3	2018	Landscapir	Sodding	Flatbed Tru	Diesel	600	0.59	2.353	0.000245	0.000757	2.46E-06	3.15E-05	2.89E-05	0.000264	0.446798
3	2018	Landscapir	Sodding	Other Gen	Diesel	175	0.43	2.353	9.56E-05	0.000351	5.87E-07	2.38E-05	2.19E-05	0.000141	0.093926
3	2018	Landscapir	Sodding	Pickup Tru	Diesel	600	0.59	2.353	0.000245	0.000757	2.46E-06	3.15E-05	2.89E-05	0.000264	0.446798
3	2018	Landscapir	Sodding	Skid Steer	Diesel	75	0.21	2.353	0.0002	0.000203	1.76E-07	2.99E-05	2.75E-05	0.000209	0.025684
3	2018	Landscapir	Topsoil Pla	Dozer	Diesel	175	0.59	1.628	9.12E-05	0.000214	5.28E-07	2.06E-05	1.89E-05	0.000115	0.090154
3	2018	Landscapir	Topsoil Pla	Dump Truc	Diesel	600	0.59	1.628	0.000169	0.000524	1.71E-06	2.18E-05	2.00E-05	0.000223	0.309132
3	2018	Landscapir	Topsoil Pla	Pickup Tru	Diesel	600	0.59	1.628	0.000169	0.000524	1.71E-06	2.18E-05	2.00E-05	0.000223	0.309132
4	2017	Building - 3	Concrete F	Backhoe	Diesel	100	0.21	320.1	0.03675	0.029512	4.41E-05	0.005308	0.004883	0.006364	4.661918
4	2017	Building - 3	Concrete F	Concrete F	Diesel	600	0.59	60	0.009391	0.026352	9.40E-05	0.001372	0.001262	0.003739	11.39277
4	2017	Building - 3	Concrete F	Fork Truck	Diesel	100	0.59	320.1	0.019272	0.019249	9.16E-05	0.002003	0.001843	0.003238	11.25021
4	2017	Building - 3	Concrete F	Tool Truck	Diesel	600	0.59	80.1	0.012536	0.03518	0.000125	0.001832	0.001685	0.004898	15.20935
4	2017	Building - 3	Concrete F	Tractor Tra	Diesel	600	0.59	15.9	0.002489	0.006983	2.49E-05	0.000364	0.000335	0.001195	3.019084
4	2017	Building - 3	Constructic	Survey Cre	Diesel	600	0.59	9.9	0.001549	0.004348	1.55E-05	0.000226	0.000208	0.000849	1.879807
4	2017	Building - 3	Constructic	Tractor Tra	Diesel	600	0.59	3.9	0.00061	0.001713	6.11E-06	8.92E-05	8.21E-05	0.000503	0.74053
4	2017	Building - 3	Exterior Wa	Fork Truck	Diesel	100	0.59	600	0.036123	0.036081	0.000172	0.003754	0.003454	0.006023	21.08755
4	2017	Building - 3	Exterior Wa	Generator	Diesel	40	0.43	300	0.009108	0.025254	2.90E-05	0.001747	0.001607	0.002409	3.039743
4	2017	Building - 3	Exterior Wa	Man Lift	Diesel	75	0.21	600	0.049903	0.055149	6.37E-05	0.007103	0.006535	0.010387	6.548868
4	2017	Building - 3	Exterior Wa	Tool Truck	Diesel	600	0.59	150	0.023476	0.06588	0.000235	0.00343	0.003156	0.00893	28.48192
4	2017	Building - 3	Exterior Wa	Tractor Tra	Diesel	600	0.59	150	0.023476	0.06588	0.000235	0.00343	0.003156	0.00893	28.48192
4	2017	Building - 3	Roofing	High Lift	Diesel	100	0.59	120	0.007225	0.007216	3.43E-05	0.000751	0.000691	0.001248	4.21751
4	2017	Building - 3	Roofing	Man Lift (F	Diesel	75	0.21	24	0.001996	0.002206	2.55E-06	0.000284	0.000261	0.000495	0.261955
4	2017	Building - 3	Roofing	Material De	Diesel	600	0.59	60	0.009391	0.026352	9.40E-05	0.001372	0.001262	0.003739	11.39277
4	2017	Building - 3	Roofing	Tractor Tra	Diesel	600	0.59	60	0.009391	0.026352	9.40E-05	0.001372	0.001262	0.003739	11.39277
4	2017	Building - 3	Structural S	90 Ton Cra	Diesel	300	0.43	5200	0.280218	1.293568	0.003116	0.05758	0.052973	0.132867	355.8587
4	2017	Building - 3	Structural S	Concrete P	Diesel	11	0.43	12	0.000281	0.000304	3.43E-07	2.96E-05	2.73E-05	5.00E-05	0.03339
4	2017	Building - 3	Structural S	Concrete T	Diesel	600	0.59	24	0.003756	0.010541	3.76E-05	0.000549	0.000505	0.001662	4.557108
4	2017	Building - 3	Structural S	Fork Truck	Diesel	100	0.59	80.1	0.004822	0.004817	2.29E-05	0.000501	0.000461	0.000851	2.815188
4	2017	Building - 3	Structural S	Tool Truck	Diesel	600	0.59	12	0.001878	0.00527	1.88E-05	0.000274	0.000252	0.00097	2.278554
4	2017	Building - 3	Structural S	Tractor Tra	Diesel	600	0.59	39.9	0.006245	0.017524	6.25E-05	0.000912	0.000839	0.002579	7.576192
4	2017	Building - 3	Structural S	Trowel Mac	Diesel	600	0.59	12	0.006193	0.014255	2.12E-05	0.000875	0.000805	0.001538	2.277613

On-Road Sources
Units for Non-Greenhouse Gases Emission: Short Ton
Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton

Scenario ID	Year	Project	Equipment	Equipment	On-road Ac	Fuel	Roadway T	Round Trip	Distance fo	Number of	Number of	Number of	Project Ler	Project Wic	Project Are	Building He	Open Spac	Number of	Activity Ra	VMT
1	2016	Building - 1	Cement Mi	Single Unit	Material De	Diesel	Urban Unre	40	5	4	--	86	--	--	100000	--	--	--	--	23125
1	2016	Building - 1	Dump Truc	Single Unit	Material De	Diesel	Urban Unre	40	5	2	--	86	--	--	100000	--	--	--	--	12333
1	2016	Building - 1	Passenger	Passenger	Employee (	Gasoline	Urban Unre	30	--	550	550	86	--	--	--	--	--	--	--	1419000
1	2016	Building - 1	Tractor Tra	Combinatic	Material De	Diesel	Urban Unre	40	5	1	--	86	--	--	100000	--	--	--	0.0024	2400
2	2017	Building - 1	Cement Mi	Single Unit	Material De	Diesel	Urban Unre	40	5	2	--	258	--	--	100000	--	--	--	--	23125
2	2017	Building - 1	Dump Truc	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--	258	--	--	100000	--	--	--	--	12333
2	2017	Building - 1	Passenger	Passenger	Employee (	Gasoline	Urban Unre	30	--	495	495	258	--	--	--	--	--	--	--	3831300
2	2017	Building - 1	Tractor Tra	Combinatic	Material De	Diesel	Urban Unre	40	5	1	--	258	--	--	100000	--	--	--	0.0024	2400
2	2017	Building - 3	Cement Mi	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--	258	--	--	30000	--	--	--	--	6938
2	2017	Building - 3	Dump Truc	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--	258	--	--	30000	--	--	--	--	3700
2	2017	Building - 3	Passenger	Passenger	Employee (	Gasoline	Urban Unre	30	--	385	385	258	--	--	--	--	--	--	--	2979900
2	2017	Building - 3	Tractor Tra	Combinatic	Material De	Diesel	Urban Unre	40	5	1	--	258	--	--	30000	--	--	--	0.00053	159
2	2017	Cargo Aprc	Asphalt 18	Combinatic	Material De	Diesel	Urban Unre	40	5	1	--	258	200	75	--	--	--	--	--	218
2	2017	Cargo Aprc	Cement Mi	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--	258	200	75	--	--	--	--	--	3469

2	2017	Cargo Aprc	Dump Truc	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--		258	200	75	--	--	--	--	--		308
2	2017	Cargo Aprc	Dump Truc	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--		258	200	75	--	--	--	--	--		1850
2	2017	Cargo Aprc	Passenger	Passenger	Employee (	Gasoline	Urban Unre	30	--	76	76		258	--	--	--	--	--	--	--		588240
3	2018	Building - 1	Cement Mi	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	10000	--	--	--	--		2313
3	2018	Building - 1	Dump Truc	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	10000	--	--	--	--		1233
3	2018	Building - 1	Passenger	Passenger	Employee (	Gasoline	Urban Unre	30	--	550	550		258	--	--	--	--	--	--	--		4257000
3	2018	Building - 1	Tractor Tra	Combinatic	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	10000	--	--	--		0.012	1200
3	2018	Building - 3	Cement Mi	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	30000	--	--	--	--		6938
3	2018	Building - 3	Dump Truc	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	30000	--	--	--	--		3700
3	2018	Building - 3	Passenger	Passenger	Employee (	Gasoline	Urban Unre	30	--	550	550		258	--	--	--	--	--	--	--		4257000
3	2018	Building - 3	Tractor Tra	Combinatic	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	30000	--	--	--		0.00053	159
3	2018	Landscapir	Flatbed Tru	Combinatic	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	--	--	--	--	--		0
3	2018	Landscapir	Passenger	Passenger	Employee (	Gasoline	Urban Unre	30	--	13	13		258	--	--	--	--	--	--	--		100620
4	2017	Building - 3	Cement Mi	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	30000	--	--	--	--		6938
4	2017	Building - 3	Dump Truc	Single Unit	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	30000	--	--	--	--		3700
4	2017	Building - 3	Passenger	Passenger	Employee (	Gasoline	Urban Unre	30	--	275	275		258	--	--	--	--	--	--	--		2128500
4	2017	Building - 3	Tractor Tra	Combinatic	Material De	Diesel	Urban Unre	40	5	1	--		258	--	--	30000	--	--	--		0.00053	159

Fugitive Sources
Units for Non-Greenhouse Gases Emission: Short Ton

Scenario ID	Year	Project	Fugitive Sc	Number of	CO	NOx	SO2	PM10	VOC
1	2016	Building - 1	Concrete M	4	0	0	0	0.08555	0
1	2016	Building - 1	Material Mc	4	0	0	0	0.01195	0
1	2016	Building - 1	Material Mc	4	0	0	0	0.0367	0
2	2017	Building - 1	Concrete M	12	0	0	0	0.08555	0
2	2017	Building - 1	Material Mc	12	0	0	0	0.01795	0
2	2017	Building - 1	Material Mc	12	0	0	0	0.05435	0
2	2017	Building - 3	Concrete M	12	0	0	0	0.02565	0
2	2017	Building - 3	Material Mc	12	0	0	0	0.01195	0
2	2017	Building - 3	Material Mc	12	0	0	0	0.03535	0
2	2017	Cargo Aprc	Asphalt Dry	12	0	0	0	0	0.55645
2	2017	Cargo Aprc	Asphalt Stc	12	0.0363	0.002266	0.000417	0.002486	0.001124
2	2017	Cargo Aprc	Concrete M	12	0	0	0	0.01285	0
2	2017	Cargo Aprc	Material Mc	12	0	0	0	0.02395	0
2	2017	Cargo Aprc	Material Mc	12	0	0	0	0.07145	0
2	2017	Cargo Aprc	Soil Handli	12	0	0	0	0.004246	0
2	2017	Cargo Aprc	Unstabilize	12	0	0	0	6.05E-09	0
3	2018	Building - 1	Material Mc	12	0	0	0	0.01195	0
3	2018	Building - 3	Concrete M	12	0	0	0	0.02565	0
3	2018	Building - 3	Material Mc	12	0	0	0	0.01195	0
3	2018	Building - 3	Material Mc	12	0	0	0	0.03535	0
3	2018	Landscapir	Material Mc	12	0	0	0	0	0
3	2018	Landscapir	Material Mc	12	0	0	0	1.39E-05	0
3	2018	Landscapir	Soil Handli	12	0	0	0	0.001415	0
4	2017	Building - 3	Concrete M	12	0	0	0	0.02565	0
4	2017	Building - 3	Material Mc	12	0	0	0	0.01195	0
4	2017	Building - 3	Material Mc	12	0	0	0	0.03535	0

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INPUT DATA AND SPECIFICATIONS

State/County
Washington
King County

Scenarios

Scenario ID	Year	Number of	Season	Average Da	Max Daily T	Min Daily Temp Change (degF)
1	2016	4	Winter	30 < T <= 5	10 <= Char	0 <= Change in T < 10
2	2017	12	Summer	30 < T <= 5	20 <= Char	10 <= Change in T < 20
3	2018	12	Summer	30 < T <= 5	20 <= Char	10 <= Change in T < 20
4	2017	12	Summer	30 < T <= 5	20 <= Char	10 <= Change in T < 20

Project Final Selections

Scenario ID	Project	Construction	Equipment	Fuel Type
1	Building - 1	Concrete F	Backhoe	Diesel
1	Building - 1	Concrete F	Concrete P	Diesel
1	Building - 1	Concrete F	Concrete R	Diesel
1	Building - 1	Concrete F	Excavator	Diesel
1	Building - 1	Concrete F	Fork Truck	Diesel
1	Building - 1	Concrete F	Tool Truck	Diesel
1	Building - 1	Concrete F	Tractor Tra	Diesel
1	Building - 1	Constructic	Survey Cre	Diesel
1	Building - 1	Constructic	Tractor Tra	Diesel
1	Building - 1	Roofing	High Lift	Diesel
1	Building - 1	Roofing	Man Lift	Diesel
1	Building - 1	Roofing	Material De	Diesel
1	Building - 1	Roofing	Tractor Tra	Diesel
1	Building - 1	Roofing	Truck Tow	Diesel
1	Building - 1	Security &	High Lift	Diesel
1	Building - 1	Security &	Tool Truck	Diesel
1	Building - 1	Structural S	90 Ton Cra	Diesel
1	Building - 1	Structural S	Concrete P	Diesel
1	Building - 1	Structural S	Concrete T	Diesel
1	Building - 1	Structural S	Fork Truck	Diesel
1	Building - 1	Structural S	Tool Truck	Diesel
1	Building - 1	Structural S	Tractor Tra	Diesel
1	Building - 1	Structural S	Trowel Ma	Diesel
1	Building - 1	Structural S	Truck Tow	Diesel
2	Building - 1	Concrete F	Backhoe	Diesel
2	Building - 1	Concrete F	Concrete P	Diesel
2	Building - 1	Concrete F	Concrete R	Diesel
2	Building - 1	Concrete F	Excavator	Diesel
2	Building - 1	Concrete F	Fork Truck	Diesel
2	Building - 1	Concrete F	Tool Truck	Diesel
2	Building - 1	Concrete F	Tractor Tra	Diesel
2	Building - 1	Constructic	Survey Cre	Diesel
2	Building - 1	Constructic	Tractor Tra	Diesel
2	Building - 1	Exterior Wa	Fork Truck	Diesel
2	Building - 1	Exterior Wa	Generator	Diesel
2	Building - 1	Exterior Wa	Grout Mixe	Diesel
2	Building - 1	Exterior Wa	Grout Whe	Diesel
2	Building - 1	Exterior Wa	Man Lift	Diesel
2	Building - 1	Exterior Wa	Tool Truck	Diesel
2	Building - 1	Exterior Wa	Tractor Tra	Diesel
2	Building - 1	Exterior Wa	Truck Tow	Diesel
2	Building - 1	Interior Bui	Fork Truck	Diesel
2	Building - 1	Interior Bui	Man Lift	Diesel
2	Building - 1	Interior Bui	Tool Truck	Diesel
2	Building - 1	Interior Bui	Tractor Tra	Diesel
2	Building - 1	Roofing	High Lift	Diesel
2	Building - 1	Roofing	Man Lift	Diesel
2	Building - 1	Roofing	Material De	Diesel
2	Building - 1	Roofing	Tractor Tra	Diesel
2	Building - 1	Roofing	Truck Tow	Diesel
2	Building - 1	Security &	High Lift	Diesel
2	Building - 1	Security &	Tool Truck	Diesel
2	Building - 1	Structural S	90 Ton Cra	Diesel
2	Building - 1	Structural S	Concrete P	Diesel
2	Building - 1	Structural S	Concrete T	Diesel
2	Building - 1	Structural S	Fork Truck	Diesel
2	Building - 1	Structural S	Tool Truck	Diesel
2	Building - 1	Structural S	Tractor Tra	Diesel

2	Building - 1	Structural S	Trowel Mac	Diesel	
2	Building - 1	Structural S	Truck Tow	Diesel	
2	Building - 3	Concrete F	Backhoe	Diesel	
2	Building - 3	Concrete F	Concrete R	Diesel	
2	Building - 3	Concrete F	Fork Truck	Diesel	
2	Building - 3	Concrete F	Tool Truck	Diesel	
2	Building - 3	Concrete F	Tractor Tra	Diesel	
2	Building - 3	Constructic	Survey Cre	Diesel	
2	Building - 3	Constructic	Tractor Tra	Diesel	
2	Building - 3	Exterior Wa	Fork Truck	Diesel	
2	Building - 3	Exterior Wa	Generator	Diesel	
2	Building - 3	Exterior Wa	Man Lift	Diesel	
2	Building - 3	Exterior Wa	Tool Truck	Diesel	
2	Building - 3	Exterior Wa	Tractor Tra	Diesel	
2	Building - 3	Interior Bui	Fork Truck	Diesel	
2	Building - 3	Interior Bui	Man Lift	Diesel	
2	Building - 3	Interior Bui	Tool Truck	Diesel	
2	Building - 3	Interior Bui	Tractor Tra	Diesel	
2	Building - 3	Roofing	High Lift	Diesel	
2	Building - 3	Roofing	Man Lift (F	Diesel	
2	Building - 3	Roofing	Material De	Diesel	
2	Building - 3	Roofing	Tractor Tra	Diesel	
2	Building - 3	Security &	High Lift	Diesel	
2	Building - 3	Security &	Tool Truck	Diesel	
2	Building - 3	Structural S	90 Ton Cra	Diesel	
2	Building - 3	Structural S	Concrete P	Diesel	
2	Building - 3	Structural S	Concrete T	Diesel	
2	Building - 3	Structural S	Fork Truck	Diesel	
2	Building - 3	Structural S	Tool Truck	Diesel	
2	Building - 3	Structural S	Tractor Tra	Diesel	
2	Building - 3	Structural S	Trowel Mac	Diesel	
2	Cargo Aprc	Asphalt Pla	Asphalt Pa	Diesel	
2	Cargo Aprc	Asphalt Pla	Dump Truc	Diesel	
2	Cargo Aprc	Asphalt Pla	Other Gene	Diesel	
2	Cargo Aprc	Asphalt Pla	Pickup Tru	Diesel	
2	Cargo Aprc	Asphalt Pla	Roller	Diesel	
2	Cargo Aprc	Asphalt Pla	Skid Steer	Diesel	
2	Cargo Aprc	Asphalt Pla	Surfacing E	Diesel	
2	Cargo Aprc	Clearing ar	Chain Saw	Diesel	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
2	Cargo Aprc	Clearing ar	Chipper/Stu	Diesel	
2	Cargo Aprc	Clearing ar	Pickup Tru	Diesel	
2	Cargo Aprc	Concrete P	Air Compre	Diesel	
2	Cargo Aprc	Concrete P	Concrete S	Diesel	
2	Cargo Aprc	Concrete P	Concrete T	Diesel	
2	Cargo Aprc	Concrete P	Other Gene	Diesel	
2	Cargo Aprc	Concrete P	Pickup Tru	Diesel	
2	Cargo Aprc	Concrete P	Rubber Tir	Diesel	
2	Cargo Aprc	Concrete P	Slip Form F	Diesel	
2	Cargo Aprc	Concrete P	Surfacing E	Diesel	
2	Cargo Aprc	Drainage -	Dozer	Diesel	
2	Cargo Aprc	Drainage -	Dump Truc	Diesel	
2	Cargo Aprc	Drainage -	Excavator	Diesel	
2	Cargo Aprc	Drainage -	Loader	Diesel	
2	Cargo Aprc	Drainage -	Other Gene	Diesel	
2	Cargo Aprc	Drainage -	Pickup Tru	Diesel	
2	Cargo Aprc	Drainage -	Roller	Diesel	
2	Cargo Aprc	Drainage -	Dump Truc	Diesel	
2	Cargo Aprc	Drainage -	Loader	Diesel	
2	Cargo Aprc	Drainage -	Other Gene	Diesel	
2	Cargo Aprc	Drainage -	Pickup Tru	Diesel	
2	Cargo Aprc	Drainage -	Tractors/Lo	Diesel	
2	Cargo Aprc	Dust Contr	Water Truc	Diesel	
2	Cargo Aprc	Excavation	Dozer	Diesel	
2	Cargo Aprc	Excavation	Dump Truc	Diesel	

2	Cargo Apr	Excavation	Pickup Tru	Diesel
2	Cargo Apr	Excavation	Roller	Diesel
2	Cargo Apr	Excavation	Dozer	Diesel
2	Cargo Apr	Excavation	Dump Truc	Diesel
2	Cargo Apr	Excavation	Excavator	Diesel
2	Cargo Apr	Excavation	Pickup Tru	Diesel
2	Cargo Apr	Excavation	Roller	Diesel
2	Cargo Apr	Excavation	Scraper	Diesel
2	Cargo Apr	Excavation	Dozer	Diesel
2	Cargo Apr	Fencing	Concrete T	Diesel
2	Cargo Apr	Fencing	Dump Truc	Diesel
2	Cargo Apr	Fencing	Other Gen	Diesel
2	Cargo Apr	Fencing	Pickup Tru	Diesel
2	Cargo Apr	Fencing	Skid Steer	Diesel
2	Cargo Apr	Fencing	Tractors/Lo	Diesel
2	Cargo Apr	Grading	Dozer	Diesel
2	Cargo Apr	Grading	Grader	Diesel
2	Cargo Apr	Grading	Roller	Diesel
2	Cargo Apr	Hydroseed	Hydroseed	Diesel
2	Cargo Apr	Hydroseed	Off-Road T	Diesel
2	Cargo Apr	Lighting	Dump Truc	Diesel
2	Cargo Apr	Lighting	Loader	Diesel
2	Cargo Apr	Lighting	Other Gen	Diesel
2	Cargo Apr	Lighting	Pickup Tru	Diesel
2	Cargo Apr	Lighting	Skid Steer	Diesel
2	Cargo Apr	Lighting	Tractors/Lo	Diesel
2	Cargo Apr	Markings	Flatbed Tr	Diesel
2	Cargo Apr	Markings	Other Gen	Diesel
2	Cargo Apr	Markings	Pickup Tru	Diesel
2	Cargo Apr	Sealing/Fu	Distributing	Diesel
2	Cargo Apr	Sealing/Fu	Other Gen	Diesel
2	Cargo Apr	Sealing/Fu	Pickup Tru	Diesel
2	Cargo Apr	Soil Erosio	Other Gen	Diesel
2	Cargo Apr	Soil Erosio	Pickup Tru	Diesel
2	Cargo Apr	Soil Erosio	Pumps	Diesel
2	Cargo Apr	Soil Erosio	Tractors/Lo	Diesel
2	Cargo Apr	Subbase P	Dozer	Diesel
2	Cargo Apr	Subbase P	Dump Truc	Diesel
2	Cargo Apr	Subbase P	Pickup Tru	Diesel
2	Cargo Apr	Subbase P	Roller	Diesel
2	Cargo Apr	Topsoil Pla	Dozer	Diesel
2	Cargo Apr	Topsoil Pla	Dump Truc	Diesel
2	Cargo Apr	Topsoil Pla	Pickup Tru	Diesel
3	Building - 1	Interior Bui	Fork Truck	Diesel
3	Building - 1	Interior Bui	Man Lift	Diesel
3	Building - 1	Interior Bui	Tool Truck	Diesel
3	Building - 1	Interior Bui	Tractor Tra	Diesel
3	Building - 1	Roofing	High Lift	Diesel
3	Building - 1	Roofing	Man Lift (F	Diesel
3	Building - 1	Roofing	Material De	Diesel
3	Building - 1	Roofing	Tractor Tra	Diesel
3	Building - 1	Security &	High Lift	Diesel
3	Building - 1	Security &	Tool Truck	Diesel
3	Building - 3	Concrete F	Backhoe	Diesel
3	Building - 3	Concrete F	Concrete P	Diesel
3	Building - 3	Concrete F	Fork Truck	Diesel
3	Building - 3	Concrete F	Tool Truck	Diesel
3	Building - 3	Concrete F	Tractor Tra	Diesel
3	Building - 3	Constructic	Survey Cre	Diesel
3	Building - 3	Constructic	Tractor Tra	Diesel
3	Building - 3	Exterior Wa	Fork Truck	Diesel
3	Building - 3	Exterior Wa	Generator	Diesel
3	Building - 3	Exterior Wa	Man Lift	Diesel
3	Building - 3	Exterior Wa	Tool Truck	Diesel

3	Building - 3	Exterior Wa	Tractor Tra	Diesel
3	Building - 3	Interior Bui	Fork Truck	Diesel
3	Building - 3	Interior Bui	Man Lift	Diesel
3	Building - 3	Interior Bui	Tool Truck	Diesel
3	Building - 3	Interior Bui	Tractor Tra	Diesel
3	Building - 3	Roofing	High Lift	Diesel
3	Building - 3	Roofing	Man Lift (F	Diesel
3	Building - 3	Roofing	Material De	Diesel
3	Building - 3	Roofing	Tractor Tra	Diesel
3	Building - 3	Security &	High Lift	Diesel
3	Building - 3	Security &	Tool Truck	Diesel
3	Building - 3	Structural S	90 Ton Cra	Diesel
3	Building - 3	Structural S	Concrete P	Diesel
3	Building - 3	Structural S	Concrete T	Diesel
3	Building - 3	Structural S	Fork Truck	Diesel
3	Building - 3	Structural S	Tool Truck	Diesel
3	Building - 3	Structural S	Tractor Tra	Diesel
3	Building - 3	Structural S	Trowel Mac	Diesel
3	Landscapir	Hydroseed	Hydroseed	Diesel
3	Landscapir	Hydroseed	Off-Road T	Diesel
3	Landscapir	Mulching	Dump Truc	Diesel
3	Landscapir	Mulching	Other Gene	Diesel
3	Landscapir	Mulching	Pickup Tru	Diesel
3	Landscapir	Mulching	Tractors/Lo	Diesel
3	Landscapir	Sodding	Flatbed Tru	Diesel
3	Landscapir	Sodding	Other Gene	Diesel
3	Landscapir	Sodding	Pickup Tru	Diesel
3	Landscapir	Sodding	Skid Steer	Diesel
3	Landscapir	Topsoil Pla	Dozer	Diesel
3	Landscapir	Topsoil Pla	Dump Truc	Diesel
3	Landscapir	Topsoil Pla	Pickup Tru	Diesel
4	Building - 3	Concrete F	Backhoe	Diesel
4	Building - 3	Concrete F	Concrete R	Diesel
4	Building - 3	Concrete F	Fork Truck	Diesel
4	Building - 3	Concrete F	Tool Truck	Diesel
4	Building - 3	Concrete F	Tractor Tra	Diesel
4	Building - 3	Constructic	Survey Cre	Diesel
4	Building - 3	Constructic	Tractor Tra	Diesel
4	Building - 3	Exterior Wa	Fork Truck	Diesel
4	Building - 3	Exterior Wa	Generator	Diesel
4	Building - 3	Exterior Wa	Man Lift	Diesel
4	Building - 3	Exterior Wa	Tool Truck	Diesel
4	Building - 3	Exterior Wa	Tractor Tra	Diesel
4	Building - 3	Roofing	High Lift	Diesel
4	Building - 3	Roofing	Man Lift (F	Diesel
4	Building - 3	Roofing	Material De	Diesel
4	Building - 3	Roofing	Tractor Tra	Diesel
4	Building - 3	Structural S	90 Ton Cra	Diesel
4	Building - 3	Structural S	Concrete P	Diesel
4	Building - 3	Structural S	Concrete T	Diesel
4	Building - 3	Structural S	Fork Truck	Diesel
4	Building - 3	Structural S	Tool Truck	Diesel
4	Building - 3	Structural S	Tractor Tra	Diesel
4	Building - 3	Structural S	Trowel Mac	Diesel

Overall Size

Scenario ID	Project	Project Size	User Input	Unit
1	Building - 1	What is the	50	$ Million(s)
2	Building - 1	What is the	45	$ Million(s)
2	Building - 3	What is the	35	$ Million(s)
2	Cargo Apro	What is the	0.7	$ Million(s)
2	Cargo Apro	What is the	200	Feet

2	Cargo Apr	What is the	75	Feet
3	Building - 1	What is the	50	$ Million(s)
3	Building - 3	What is the	50	$ Million(s)
3	Landscapir	What is the	0.2	$ Million(s)
3	Landscapir	What is the	50	Feet
3	Landscapir	What is the	100	Feet
3	Landscapir	What is the	3	---
3	Landscapir	What is the	1	---
4	Building - 3	What is the	25	$ Million(s)

Size Detail (Estimated based on engineering experience)

ScenarioID	Project	Constructic	Default Act	Unit	User Activity Size
2	Cargo Apr	Asphalt Pla	1665	Square Ya	93683
2	Cargo Apr	Clearing ar	0.4	Acres	
2	Cargo Apr	Concrete P	693.8	Cubic Yard	35091
2	Cargo Apr	Drainage -	210	Linear Feet	
2	Cargo Apr	Drainage -	420	Linear Feet	
2	Cargo Apr	Dust Contr	360	Days	
2	Cargo Apr	Excavation	693.8	Cubic Yards	
2	Cargo Apr	Excavation	693.8	Cubic Yards	
2	Cargo Apr	Excavation	1665	Square Yards	
2	Cargo Apr	Fencing	200	Linear Feet	
2	Cargo Apr	Grading	1981.4	Square Yards	
2	Cargo Apr	Hydroseed	17850	Square Feet	
2	Cargo Apr	Lighting	550	Linear Feet	
2	Cargo Apr	Markings	15000	Square Feet	
2	Cargo Apr	Sealing/Fu	1665	Square Yards	
2	Cargo Apr	Soil Erosio	0.4	Acres	
2	Cargo Apr	Subbase P	1665	Square Yards	
2	Cargo Apr	Subbase P	555	Cubic Yards	
2	Cargo Apr	Topsoil Pla	330.2	Cubic Yards	
3	Landscapir	Hydroseed	6600	Square Feet	
3	Landscapir	Mulching	0.1	Acres	
3	Landscapir	Sodding	5000	Square Feet	
3	Landscapir	Topsoil Pla	122.1	Cubic Yards	
3	Landscapir	Topsoil Pla	122.1	Cubic Yards	

Activity: Non-Road (Estimated based on engineering experience)

Scenario ID	Project	Constructic	Equipment	Fuel Type	Activity Siz	Activity Ra	Default Act	Activity Uni	User Activity Data
1	Building - 1	Concrete F	Backhoe	Diesel	100000.00	0.0048 Hou	480	hours	
1	Building - 1	Concrete F	Concrete P	Diesel	100000.00	0.0018 Hou	180	hours	
1	Building - 1	Concrete F	Concrete R	Diesel	100000.00	0.0036 Hou	360	hours	
1	Building - 1	Concrete F	Excavator	Diesel	100000.00	0.0016 Hou	160	hours	
1	Building - 1	Concrete F	Fork Truck	Diesel	100000.00	0.0048 Hou	480	hours	
1	Building - 1	Concrete F	Tool Truck	Diesel	100000.00	0.0012 Hou	120	hours	
1	Building - 1	Concrete F	Tractor Tra	Diesel	100000.00	0.0024 Hou	240	hours	
1	Building - 1	Constructic	Survey Cre	Diesel	100000.00	0.0001 Hou	10	hours	
1	Building - 1	Constructic	Tractor Tra	Diesel	100000.00	0.00004 Ho	4	hours	
1	Building - 1	Roofing	High Lift	Diesel	100000.00	0.0016 Hou	160	hours	
1	Building - 1	Roofing	Man Lift	Diesel	100000.00	0.0004 Hou	40	hours	
1	Building - 1	Roofing	Material De	Diesel	100000.00	0.0006 Hou	60	hours	
1	Building - 1	Roofing	Tractor Tra	Diesel	100000.00	0.0004 Hou	40	hours	
1	Building - 1	Roofing	Truck Towe	Diesel	100000.00	0.0012 Hou	120	hours	
1	Building - 1	Security &	High Lift	Diesel	100000.00	0.008 Hour	800	hours	
1	Building - 1	Security &	Tool Truck	Diesel	100000.00	0.008 Hour	800	hours	
1	Building - 1	Structural S	90 Ton Cra	Diesel	100000.00	0.0024 Hou	240	hours	11760
1	Building - 1	Structural S	Concrete P	Diesel	100000.00	0.0006 Hou	60	hours	
1	Building - 1	Structural S	Concrete T	Diesel	100000.00	0.0006 Hou	60	hours	
1	Building - 1	Structural S	Fork Truck	Diesel	100000.00	0.0064 Hou	640	hours	
1	Building - 1	Structural S	Tool Truck	Diesel	100000.00	0.0016 Hou	160	hours	

1	Building - 1	Structural S	Tractor Tra	Diesel	100000.00	0.0036	Hou	360	hours	
1	Building - 1	Structural S	Trowel Mac	Diesel	100000.00	0.0004	Hou	40	hours	
1	Building - 1	Structural S	Truck Towe	Diesel	100000.00	0.0072	Hou	720	hours	
2	Building - 1	Concrete F	Backhoe	Diesel	100000.00	0.0048	Hou	480	hours	
2	Building - 1	Concrete F	Concrete P	Diesel	100000.00	0.0018	Hou	180	hours	
2	Building - 1	Concrete F	Concrete R	Diesel	100000.00	0.0036	Hou	360	hours	
2	Building - 1	Concrete F	Excavator	Diesel	100000.00	0.0016	Hou	160	hours	
2	Building - 1	Concrete F	Fork Truck	Diesel	100000.00	0.0048	Hou	480	hours	
2	Building - 1	Concrete F	Tool Truck	Diesel	100000.00	0.0012	Hou	120	hours	
2	Building - 1	Concrete F	Tractor Tra	Diesel	100000.00	0.0024	Hou	240	hours	
2	Building - 1	Constructic	Survey Cre	Diesel	100000.00	0.0001	Hou	10	hours	
2	Building - 1	Constructic	Tractor Tra	Diesel	100000.00	0.00004	Ho	4	hours	
2	Building - 1	Exterior Wa	Fork Truck	Diesel	100000.00	0.0084	Hou	840	hours	
2	Building - 1	Exterior Wa	Generator	Diesel	100000.00	0.0008	Hou	80	hours	
2	Building - 1	Exterior Wa	Grout Mixe	Diesel	100000.00	0.0042	Hou	420	hours	
2	Building - 1	Exterior Wa	Grout Whe	Diesel	100000.00	0.0016	Hou	160	hours	
2	Building - 1	Exterior Wa	Man Lift	Diesel	100000.00	0.0168	Hou	1680	hours	
2	Building - 1	Exterior Wa	Tool Truck	Diesel	100000.00	0.0042	Hou	420	hours	
2	Building - 1	Exterior Wa	Tractor Tra	Diesel	100000.00	0.0084	Hou	840	hours	
2	Building - 1	Exterior Wa	Truck Towe	Diesel	100000.00	0.0008	Hou	80	hours	
2	Building - 1	Interior Bui	Fork Truck	Diesel	100000.00	0.016	Hour	1600	hours	
2	Building - 1	Interior Bui	Man Lift	Diesel	100000.00	0.032	Hour	3200	hours	
2	Building - 1	Interior Bui	Tool Truck	Diesel	100000.00	0.016	Hour	1600	hours	
2	Building - 1	Interior Bui	Tractor Tra	Diesel	100000.00	0.016	Hour	1600	hours	
2	Building - 1	Roofing	High Lift	Diesel	100000.00	0.0016	Hou	160	hours	
2	Building - 1	Roofing	Man Lift	Diesel	100000.00	0.0004	Hou	40	hours	
2	Building - 1	Roofing	Material De	Diesel	100000.00	0.0006	Hou	60	hours	
2	Building - 1	Roofing	Tractor Tra	Diesel	100000.00	0.0004	Hou	40	hours	
2	Building - 1	Roofing	Truck Towe	Diesel	100000.00	0.0012	Hou	120	hours	
2	Building - 1	Security &	High Lift	Diesel	100000.00	0.008	Hour	800	hours	
2	Building - 1	Security &	Tool Truck	Diesel	100000.00	0.008	Hour	800	hours	
2	Building - 1	Structural S	90 Ton Cra	Diesel	100000.00	0.0024	Hou	240	hours	11572
2	Building - 1	Structural S	Concrete P	Diesel	100000.00	0.0006	Hou	60	hours	
2	Building - 1	Structural S	Concrete T	Diesel	100000.00	0.0006	Hou	60	hours	
2	Building - 1	Structural S	Fork Truck	Diesel	100000.00	0.0064	Hou	640	hours	
2	Building - 1	Structural S	Tool Truck	Diesel	100000.00	0.0016	Hou	160	hours	
2	Building - 1	Structural S	Tractor Tra	Diesel	100000.00	0.0036	Hou	360	hours	
2	Building - 1	Structural S	Trowel Mac	Diesel	100000.00	0.0004	Hou	40	hours	
2	Building - 1	Structural S	Truck Towe	Diesel	100000.00	0.0072	Hou	720	hours	
2	Building - 3	Concrete F	Backhoe	Diesel	30000.00	0.01067	Ho	320.1	hours	
2	Building - 3	Concrete F	Concrete R	Diesel	30000.00	0.002	Hour	60	hours	
2	Building - 3	Concrete F	Fork Truck	Diesel	30000.00	0.01067	Ho	320.1	hours	
2	Building - 3	Concrete F	Tool Truck	Diesel	30000.00	0.00267	Ho	80.1	hours	
2	Building - 3	Concrete F	Tractor Tra	Diesel	30000.00	0.00053	Ho	15.9	hours	
2	Building - 3	Constructic	Survey Cre	Diesel	30000.00	0.00033	Ho	9.9	hours	
2	Building - 3	Constructic	Tractor Tra	Diesel	30000.00	0.00013	Ho	3.9	hours	
2	Building - 3	Exterior Wa	Fork Truck	Diesel	30000.00	0.02	Hours	600	hours	
2	Building - 3	Exterior Wa	Generator	Diesel	30000.00	0.01	Hours	300	hours	
2	Building - 3	Exterior Wa	Man Lift	Diesel	30000.00	0.02	Hours	600	hours	
2	Building - 3	Exterior Wa	Tool Truck	Diesel	30000.00	0.005	Hour	150	hours	
2	Building - 3	Exterior Wa	Tractor Tra	Diesel	30000.00	0.005	Hour	150	hours	
2	Building - 3	Interior Bui	Fork Truck	Diesel	30000.00	0.08	Hours	2400	hours	
2	Building - 3	Interior Bui	Man Lift	Diesel	30000.00	0.08	Hours	2400	hours	
2	Building - 3	Interior Bui	Tool Truck	Diesel	30000.00	0.01	Hours	300	hours	
2	Building - 3	Interior Bui	Tractor Tra	Diesel	30000.00	0.02	Hours	600	hours	
2	Building - 3	Roofing	High Lift	Diesel	30000.00	0.004	Hour	120	hours	
2	Building - 3	Roofing	Man Lift (P	Diesel	30000.00	0.0008	Hou	24	hours	
2	Building - 3	Roofing	Material De	Diesel	30000.00	0.002	Hour	60	hours	
2	Building - 3	Roofing	Tractor Tra	Diesel	30000.00	0.002	Hour	60	hours	
2	Building - 3	Security &	High Lift	Diesel	30000.00	0.02667	Ho	800.1	hours	
2	Building - 3	Security &	Tool Truck	Diesel	30000.00	0.00667	Ho	200.1	hours	
2	Building - 3	Structural S	90 Ton Cra	Diesel	30000.00	0.01067	Ho	320.1	hours	
2	Building - 3	Structural S	Concrete P	Diesel	30000.00	0.0004	Hou	12	hours	
2	Building - 3	Structural S	Concrete T	Diesel	30000.00	0.0008	Hou	24	hours	

2	Building - S	Structural S	Fork Truck	Diesel	30000.00 S	0.00267 Ho	80.1	hours		
2	Building - S	Structural S	Tool Truck	Diesel	30000.00 S	0.0004 Hou	12	hours		
2	Building - S	Structural S	Tractor Tra	Diesel	30000.00 S	0.00133 Ho	39.9	hours		
2	Building - S	Structural S	Trowel Mac	Diesel	30000.00 S	0.0004 Hou	12	hours		
2	Cargo Aprc	Asphalt Pla	Asphalt Pa	Diesel	1665.00 S\	8 Hours pe	2.08	hours	117.104	
2	Cargo Aprc	Asphalt Pla	Dump Truc	Diesel	1665.00 S\	8 Hours pe	7.5	hours	421.758	
2	Cargo Aprc	Asphalt Pla	Other Gene	Diesel	1665.00 S\	16 Hours p	4.16	hours	234.208	
2	Cargo Aprc	Asphalt Pla	Pickup Tru	Diesel	1665.00 S\	8 Hours pe	2.08	hours	117.104	
2	Cargo Aprc	Asphalt Pla	Roller	Diesel	1665.00 S\	8 Hours pe	2.08	hours	117.104	
2	Cargo Aprc	Asphalt Pla	Skid Steer	Diesel	1665.00 S\	8 Hours pe	2.08	hours	117.104	
2	Cargo Aprc	Asphalt Pla	Surfacing E	Diesel	1665.00 S\	8 Hours pe	2.66	hours	149.893	
2	Cargo Aprc	Clearing ar	Chain Saw	Diesel	0.40 Acre	12 Hours p	4.8	hours		*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
2	Cargo Aprc	Clearing ar	Chipper/Stu	Diesel	0.40 Acre	12 Hours p	4.8	hours		
2	Cargo Aprc	Clearing ar	Pickup Tru	Diesel	0.40 Acre	16 Hours p	6.4	hours		
2	Cargo Aprc	Concrete P	Air Compre	Diesel	693.80 CY	8 Hours pe	5.55	hours	280.728	
2	Cargo Aprc	Concrete P	Concrete S	Diesel	693.80 CY	8 Hours pe	5.55	hours	280.728	
2	Cargo Aprc	Concrete P	Concrete T	Diesel	693.80 CY	8 Hours pe	23.13	hours	1169.7	
2	Cargo Aprc	Concrete P	Other Gene	Diesel	693.80 CY	16 Hours p	11.1	hours	561.456	
2	Cargo Aprc	Concrete P	Pickup Tru	Diesel	693.80 CY	24 Hours p	16.65	hours	842.184	
2	Cargo Aprc	Concrete P	Rubber Tir	Diesel	693.80 CY	8 Hours pe	5.55	hours	280.728	
2	Cargo Aprc	Concrete P	Slip Form F	Diesel	693.80 CY	8 Hours pe	5.55	hours	280.728	
2	Cargo Aprc	Concrete P	Surfacing E	Diesel	693.80 CY	8 Hours pe	5.55	hours	280.728	
2	Cargo Aprc	Drainage -	Dozer	Diesel	210.00 LF	8 Hours pe	6.72	hours		
2	Cargo Aprc	Drainage -	Dump Truc	Diesel	210.00 LF	8 Hours pe	6.72	hours		
2	Cargo Aprc	Drainage -	Excavator	Diesel	210.00 LF	8 Hours pe	6.72	hours		
2	Cargo Aprc	Drainage -	Loader	Diesel	210.00 LF	8 Hours pe	6.72	hours		
2	Cargo Aprc	Drainage -	Other Gene	Diesel	210.00 LF	8 Hours pe	6.72	hours		
2	Cargo Aprc	Drainage -	Pickup Tru	Diesel	210.00 LF	8 Hours pe	6.72	hours		
2	Cargo Aprc	Drainage -	Roller	Diesel	210.00 LF	8 Hours pe	6.72	hours		
2	Cargo Aprc	Drainage -	Dump Truc	Diesel	420.00 LF	8 Hours pe	3.73	hours		
2	Cargo Aprc	Drainage -	Loader	Diesel	420.00 LF	8 Hours pe	3.73	hours		
2	Cargo Aprc	Drainage -	Other Gene	Diesel	420.00 LF	8 Hours pe	3.73	hours		
2	Cargo Aprc	Drainage -	Pickup Tru	Diesel	420.00 LF	8 Hours pe	3.73	hours		
2	Cargo Aprc	Drainage -	Tractors/Lo	Diesel	420.00 LF	8 Hours pe	3.73	hours		
2	Cargo Aprc	Dust Contr	Water Truc	Diesel	360.00 Day	8 Hours pe	2880	hours		
2	Cargo Aprc	Excavation	Dozer	Diesel	693.80 CY	8 Hours pe	9.25	hours		
2	Cargo Aprc	Excavation	Dump Truc	Diesel	693.80 CY	8 Hours pe	9.25	hours		
2	Cargo Aprc	Excavation	Pickup Tru	Diesel	693.80 CY	8 Hours pe	9.25	hours		
2	Cargo Aprc	Excavation	Roller	Diesel	693.80 CY	8 Hours pe	4.27	hours		
2	Cargo Aprc	Excavation	Dozer	Diesel	693.80 CY	8 Hours pe	6.94	hours		
2	Cargo Aprc	Excavation	Dump Truc	Diesel	693.80 CY	8 Hours pe	18.5	hours		
2	Cargo Aprc	Excavation	Excavator	Diesel	693.80 CY	8 Hours pe	5.55	hours		
2	Cargo Aprc	Excavation	Pickup Tru	Diesel	693.80 CY	8 Hours pe	5.55	hours		
2	Cargo Aprc	Excavation	Roller	Diesel	693.80 CY	8 Hours pe	5.55	hours		
2	Cargo Aprc	Excavation	Scraper	Diesel	693.80 CY	8 Hours pe	6.94	hours		
2	Cargo Aprc	Excavation	Dozer	Diesel	1665.00 S\	8 Hours pe	2.61	hours		
2	Cargo Aprc	Fencing	Concrete T	Diesel	200.00 LF	2 Hours pe	2.22	hours		
2	Cargo Aprc	Fencing	Dump Truc	Diesel	200.00 LF	8 Hours pe	8.89	hours		
2	Cargo Aprc	Fencing	Other Gene	Diesel	200.00 LF	8 Hours pe	8.89	hours		
2	Cargo Aprc	Fencing	Pickup Tru	Diesel	200.00 LF	8 Hours pe	8.89	hours		
2	Cargo Aprc	Fencing	Skid Steer	Diesel	200.00 LF	8 Hours pe	8.89	hours		
2	Cargo Aprc	Fencing	Tractors/Lo	Diesel	200.00 LF	8 Hours pe	8.89	hours		
2	Cargo Aprc	Grading	Dozer	Diesel	1981.40 S\	8 Hours pe	1.98	hours		
2	Cargo Aprc	Grading	Grader	Diesel	1981.40 S\	8 Hours pe	1.98	hours		
2	Cargo Aprc	Grading	Roller	Diesel	1981.40 S\	8 Hours pe	1.98	hours		
2	Cargo Aprc	Hydroseed	Hydroseed	Diesel	17850.00 S	8 Hours pe	1.79	hours		
2	Cargo Aprc	Hydroseed	Off-Road T	Diesel	17850.00 S	8 Hours pe	1.79	hours		
2	Cargo Aprc	Lighting	Dump Truc	Diesel	550.00 LF	8 Hours pe	3.67	hours		
2	Cargo Aprc	Lighting	Loader	Diesel	550.00 LF	8 Hours pe	3.67	hours		
2	Cargo Aprc	Lighting	Other Gene	Diesel	550.00 LF	8 Hours pe	3.67	hours		
2	Cargo Aprc	Lighting	Pickup Tru	Diesel	550.00 LF	8 Hours pe	3.67	hours		
2	Cargo Aprc	Lighting	Skid Steer	Diesel	550.00 LF	8 Hours pe	3.67	hours		
2	Cargo Aprc	Lighting	Tractors/Lo	Diesel	550.00 LF	8 Hours pe	3.67	hours		
2	Cargo Aprc	Markings	Flatbed Tru	Diesel	15000.00 S	8 Hours pe	34.29	hours		

2	Cargo Aprc	Markings	Other Gene	Diesel	15000.00	SY	8 Hours pe	34.29	hours
2	Cargo Aprc	Markings	Pickup Tru	Diesel	15000.00	SY	8 Hours pe	34.29	hours
2	Cargo Aprc	Sealing/Fu	Distributing	Diesel	1665.00	SY	8 Hours pe	4.44	hours
2	Cargo Aprc	Sealing/Fu	Other Gene	Diesel	1665.00	SY	8 Hours pe	4.44	hours
2	Cargo Aprc	Sealing/Fu	Pickup Tru	Diesel	1665.00	SY	8 Hours pe	4.44	hours
2	Cargo Aprc	Soil Erosio	Other Gene	Diesel	0.40	Acre	4 Hours pe	1.6	hours
2	Cargo Aprc	Soil Erosio	Pickup Tru	Diesel	0.40	Acre	8 Hours pe	3.2	hours
2	Cargo Aprc	Soil Erosio	Pumps	Diesel	0.40	Acre	4 Hours pe	1.6	hours
2	Cargo Aprc	Soil Erosio	Tractors/Lo	Diesel	0.40	Acre	4 Hours pe	1.6	hours
2	Cargo Aprc	Subbase P	Dozer	Diesel	1665.00	SY	8 Hours pe	3.51	hours
2	Cargo Aprc	Subbase P	Dump Truc	Diesel	555.00	CY	8 Hours pe	24.67	hours
2	Cargo Aprc	Subbase P	Pickup Tru	Diesel	1665.00	SY	8 Hours pe	3.51	hours
2	Cargo Aprc	Subbase P	Roller	Diesel	555.00	CY	8 Hours pe	3.42	hours
2	Cargo Aprc	Topsoil Pla	Dozer	Diesel	330.20	CY	8 Hours pe	4.4	hours
2	Cargo Aprc	Topsoil Pla	Dump Truc	Diesel	330.20	CY	8 Hours pe	4.4	hours
2	Cargo Aprc	Topsoil Pla	Pickup Tru	Diesel	330.20	CY	8 Hours pe	4.4	hours
3	Building - 1	Interior Bui	Fork Truck	Diesel	10000.00	SF	0.096 Hour	960	hours
3	Building - 1	Interior Bui	Man Lift	Diesel	10000.00	SF	0.096 Hour	960	hours
3	Building - 1	Interior Bui	Tool Truck	Diesel	10000.00	SF	0.012 Hour	120	hours
3	Building - 1	Interior Bui	Tractor Tra	Diesel	10000.00	SF	0.012 Hour	120	hours
3	Building - 1	Roofing	High Lift	Diesel	10000.00	SF	0.012 Hour	120	hours
3	Building - 1	Roofing	Man Lift (F	Diesel	10000.00	SF	0.012 Hour	120	hours
3	Building - 1	Roofing	Material De	Diesel	10000.00	SF	0.0008 Hou	8	hours
3	Building - 1	Roofing	Tractor Tra	Diesel	10000.00	SF	0.0012 Hou	12	hours
3	Building - 1	Security &	High Lift	Diesel	10000.00	SF	0.032 Hour	320	hours
3	Building - 1	Security &	Tool Truck	Diesel	10000.00	SF	0.008 Hour	80	hours
3	Building - 3	Concrete F	Backhoe	Diesel	30000.00	SF	0.01067 Ho	320.1	hours
3	Building - 3	Concrete F	Concrete R	Diesel	30000.00	SF	0.002 Hour	60	hours
3	Building - 3	Concrete F	Fork Truck	Diesel	30000.00	SF	0.01067 Ho	320.1	hours
3	Building - 3	Concrete F	Tool Truck	Diesel	30000.00	SF	0.00267 Ho	80.1	hours
3	Building - 3	Concrete F	Tractor Tra	Diesel	30000.00	SF	0.00053 Ho	15.9	hours
3	Building - 3	Constructic	Survey Cre	Diesel	30000.00	SF	0.00033 Ho	9.9	hours
3	Building - 3	Constructic	Tractor Tra	Diesel	30000.00	SF	0.00013 Ho	3.9	hours
3	Building - 3	Exterior Wa	Fork Truck	Diesel	30000.00	SF	0.02 Hours	600	hours
3	Building - 3	Exterior Wa	Generator	Diesel	30000.00	SF	0.01 Hours	300	hours
3	Building - 3	Exterior Wa	Man Lift	Diesel	30000.00	SF	0.02 Hours	600	hours
3	Building - 3	Exterior Wa	Tool Truck	Diesel	30000.00	SF	0.005 Hour	150	hours
3	Building - 3	Exterior Wa	Tractor Tra	Diesel	30000.00	SF	0.005 Hour	150	hours
3	Building - 3	Interior Bui	Fork Truck	Diesel	30000.00	SF	0.08 Hours	2400	hours
3	Building - 3	Interior Bui	Man Lift	Diesel	30000.00	SF	0.08 Hours	2400	hours
3	Building - 3	Interior Bui	Tool Truck	Diesel	30000.00	SF	0.01 Hours	300	hours
3	Building - 3	Interior Bui	Tractor Tra	Diesel	30000.00	SF	0.02 Hours	600	hours
3	Building - 3	Roofing	High Lift	Diesel	30000.00	SF	0.004 Hour	120	hours
3	Building - 3	Roofing	Man Lift (F	Diesel	30000.00	SF	0.0008 Hou	24	hours
3	Building - 3	Roofing	Material De	Diesel	30000.00	SF	0.002 Hour	60	hours
3	Building - 3	Roofing	Tractor Tra	Diesel	30000.00	SF	0.002 Hour	60	hours
3	Building - 3	Security &	High Lift	Diesel	30000.00	SF	0.02667 Ho	800.1	hours
3	Building - 3	Security &	Tool Truck	Diesel	30000.00	SF	0.00667 Ho	200.1	hours
3	Building - 3	Structural S	90 Ton Cra	Diesel	30000.00	SF	0.01067 Ho	320.1	hours
3	Building - 3	Structural S	Concrete P	Diesel	30000.00	SF	0.0004 Hou	12	hours
3	Building - 3	Structural S	Concrete T	Diesel	30000.00	SF	0.0008 Hou	24	hours
3	Building - 3	Structural S	Fork Truck	Diesel	30000.00	SF	0.00267 Ho	80.1	hours
3	Building - 3	Structural S	Tool Truck	Diesel	30000.00	SF	0.0004 Hou	12	hours
3	Building - 3	Structural S	Tractor Tra	Diesel	30000.00	SF	0.00133 Ho	39.9	hours
3	Building - 3	Structural S	Trowel Ma	Diesel	30000.00	SF	0.0004 Hou	12	hours
3	Landscapir	Hydroseed	Hydroseed	Diesel	6600.00	SF	8 Hours pe	0.66	hours
3	Landscapir	Hydroseed	Off-Road T	Diesel	6600.00	SF	8 Hours pe	0.66	hours
3	Landscapir	Mulching	Dump Truc	Diesel	0.10	Acres	8 Hours pe	0.4	hours
3	Landscapir	Mulching	Other Gene	Diesel	0.10	Acres	8 Hours pe	0.4	hours
3	Landscapir	Mulching	Pickup Tru	Diesel	0.10	Acres	8 Hours pe	0.4	hours
3	Landscapir	Mulching	Tractors/Lo	Diesel	0.10	Acres	8 Hours pe	0.4	hours
3	Landscapir	Sodding	Flatbed Tru	Diesel	5000.00	SF	8 Hours pe	2.35	hours
3	Landscapir	Sodding	Other Gene	Diesel	5000.00	SF	8 Hours pe	2.35	hours
3	Landscapir	Sodding	Pickup Tru	Diesel	5000.00	SF	8 Hours pe	2.35	hours

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3	Landscapir	Sodding	Skid Steer	Diesel	5000.00 SF	8 Hours pe	2.35	hours	
3	Landscapir	Topsoil Pla	Dozer	Diesel	122.10 CY	8 Hours pe	1.63	hours	
3	Landscapir	Topsoil Pla	Dump Truc	Diesel	122.10 CY	8 Hours pe	1.63	hours	
3	Landscapir	Topsoil Pla	Pickup Tru	Diesel	122.10 CY	8 Hours pe	1.63	hours	
4	Building - 3	Concrete F	Backhoe	Diesel	30000.00 S	0.01067 Ho	320.1	hours	
4	Building - 3	Concrete F	Concrete P	Diesel	30000.00 S	0.002 Hour	60	hours	
4	Building - 3	Concrete F	Fork Truck	Diesel	30000.00 S	0.01067 Ho	320.1	hours	
4	Building - 3	Concrete F	Tool Truck	Diesel	30000.00 S	0.00267 Ho	80.1	hours	
4	Building - 3	Concrete F	Tractor Tra	Diesel	30000.00 S	0.00053 Ho	15.9	hours	
4	Building - 3	Constructic	Survey Cre	Diesel	30000.00 S	0.00033 Ho	9.9	hours	
4	Building - 3	Constructic	Tractor Tra	Diesel	30000.00 S	0.00013 Ho	3.9	hours	
4	Building - 3	Exterior Wa	Fork Truck	Diesel	30000.00 S	0.02 Hours	600	hours	
4	Building - 3	Exterior Wa	Generator	Diesel	30000.00 S	0.01 Hours	300	hours	
4	Building - 3	Exterior Wa	Man Lift	Diesel	30000.00 S	0.02 Hours	600	hours	
4	Building - 3	Exterior Wa	Tool Truck	Diesel	30000.00 S	0.005 Hour	150	hours	
4	Building - 3	Exterior Wa	Tractor Tra	Diesel	30000.00 S	0.005 Hour	150	hours	
4	Building - 3	Roofing	High Lift	Diesel	30000.00 S	0.004 Hour	120	hours	
4	Building - 3	Roofing	Man Lift (F	Diesel	30000.00 S	0.0008 Hou	24	hours	
4	Building - 3	Roofing	Material De	Diesel	30000.00 S	0.002 Hour	60	hours	
4	Building - 3	Roofing	Tractor Tra	Diesel	30000.00 S	0.002 Hour	60	hours	
4	Building - 3	Structural S	90 Ton Cra	Diesel	30000.00 S	0.01067 Ho	320.1	hours	5200
4	Building - 3	Structural S	Concrete P	Diesel	30000.00 S	0.0004 Hou	12	hours	
4	Building - 3	Structural S	Concrete T	Diesel	30000.00 S	0.0008 Hou	24	hours	
4	Building - 3	Structural S	Fork Truck	Diesel	30000.00 S	0.00267 Ho	80.1	hours	
4	Building - 3	Structural S	Tool Truck	Diesel	30000.00 S	0.0004 Hou	12	hours	
4	Building - 3	Structural S	Tractor Tra	Diesel	30000.00 S	0.00133 Ho	39.9	hours	
4	Building - 3	Structural S	Trowel Ma	Diesel	30000.00 S	0.0004 Hou	12	hours	

Activity: On-Road (Estimated based on engineering experience)

Scenario ID	Project	Equipment	On-road Ac	Fuel	Roadway T	Round Trip	Number of	Number of	Project Ler	Project Wic	Project Are	Building He	Open Spac	Number of	Activity Siz	Activity Rat	Default VM	User VMT
1	Building - 1	Cement Mi	Material De	Diesel	Urban Unre	40	--	86	--	--	100000	--	--	--	--	--	23125	
1	Building - 1	Dump Truc	Material De	Diesel	Urban Unre	40	--	86	--	--	100000	--	--	--	--	--	12333	
1	Building - 1	Passenger	Employee (	Gasoline	Urban Unre	30	550	86	--	--	--	--	--	--	--	--	1419000	
1	Building - 1	Tractor Tra	Material De	Diesel	Urban Unre	40	--	86	--	--	100000	--	--	--	--	0.0024	2400	
2	Building - 1	Cement Mi	Material De	Diesel	Urban Unre	40	--	258	--	--	100000	--	--	--	--	--	23125	
2	Building - 1	Dump Truc	Material De	Diesel	Urban Unre	40	--	258	--	--	100000	--	--	--	--	--	12333	
2	Building - 1	Passenger	Employee (	Gasoline	Urban Unre	30	495	258	--	--	--	--	--	--	--	--	3831300	
2	Building - 1	Tractor Tra	Material De	Diesel	Urban Unre	40	--	258	--	--	100000	--	--	--	--	0.0024	2400	
2	Building - 3	Cement Mi	Material De	Diesel	Urban Unre	40	--	258	--	--	30000	--	--	--	--	--	6938	
2	Building - 3	Dump Truc	Material De	Diesel	Urban Unre	40	--	258	--	--	30000	--	--	--	--	--	3700	
2	Building - 3	Passenger	Employee (	Gasoline	Urban Unre	30	385	258	--	--	--	--	--	--	--	--	2979900	
2	Building - 3	Tractor Tra	Material De	Diesel	Urban Unre	40	--	258	--	--	30000	--	--	--	--	0.00053	159	
2	Cargo Apr	Asphalt 18	Material De	Diesel	Urban Unre	40	--	258	200	75	--	--	--	--	--	--	218	
2	Cargo Apr	Cement Mi	Material De	Diesel	Urban Unre	40	--	258	200	75	--	--	--	--	--	--	3469	
2	Cargo Apr	Dump Truc	Material De	Diesel	Urban Unre	40	--	258	200	75	--	--	--	--	--	--	308	
2	Cargo Apr	Dump Truc	Material De	Diesel	Urban Unre	40	--	258	200	75	--	--	--	--	--	--	1850	
2	Cargo Apr	Passenger	Employee (	Gasoline	Urban Unre	30	76	258	--	--	--	--	--	--	--	--	588240	
3	Building - 1	Cement Mi	Material De	Diesel	Urban Unre	40	--	258	--	--	10000	--	--	--	--	--	2313	
3	Building - 1	Dump Truc	Material De	Diesel	Urban Unre	40	--	258	--	--	10000	--	--	--	--	--	1233	
3	Building - 1	Passenger	Employee (	Gasoline	Urban Unre	30	550	258	--	--	--	--	--	--	--	--	4257000	
3	Building - 1	Tractor Tra	Material De	Diesel	Urban Unre	40	--	258	--	--	10000	--	--	--	--	0.012	1200	
3	Building - 3	Cement Mi	Material De	Diesel	Urban Unre	40	--	258	--	--	30000	--	--	--	--	--	6938	
3	Building - 3	Dump Truc	Material De	Diesel	Urban Unre	40	--	258	--	--	30000	--	--	--	--	--	3700	
3	Building - 3	Passenger	Employee (	Gasoline	Urban Unre	30	550	258	--	--	--	--	--	--	--	--	4257000	
3	Building - 3	Tractor Tra	Material De	Diesel	Urban Unre	40	--	258	--	--	30000	--	--	--	--	0.00053	159	
3	Landscapir	Flatbed Tru	Material De	Diesel	Urban Unre	40	--	258	--	--	--	--	--	--	--	--	0	
3	Landscapir	Passenger	Employee (	Gasoline	Urban Unre	30	13	258	--	--	--	--	--	--	--	--	100620	
4	Building - 3	Cement Mi	Material De	Diesel	Urban Unre	40	--	258	--	--	30000	--	--	--	--	--	6938	
4	Building - 3	Dump Truc	Material De	Diesel	Urban Unre	40	--	258	--	--	30000	--	--	--	--	--	3700	
4	Building - 3	Passenger	Employee (	Gasoline	Urban Unre	30	275	258	--	--	--	--	--	--	--	--	2128500	
4	Building - 3	Tractor Tra	Material De	Diesel	Urban Unre	40	--	258	--	--	30000	--	--	--	--	0.00053	159	

Emission Factor: Non-Road (from NONROAD)

Scenario ID	Project	Constructic	Equipment	Fuel Type	Avg Rated	Load Factc	CO (g/hp-h	NOx (g/hp-	CO2 (g/hp-	SO2 (g/hp-	PM10 (g/hp	PM2.5 (g/h	VOC Exhai	VOC Evaporative (g/equipment-day)
1	Building - 1	Concrete F	Backhoe	Diesel	100	0.21	5.362018	4.340302	693.2583	0.00774	0.783499	0.720819	0.904574	0.830832
1	Building - 1	Concrete F	Concrete P	Diesel	11	0.43	4.510232	5.02368	588.184	0.006991	0.499497	0.459538	0.721233	0.029442
1	Building - 1	Concrete F	Concrete R	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Concrete F	Excavator	Diesel	175	0.59	0.66936	1.617984	536.2858	0.005542	0.155228	0.14281	0.179814	0.393272
1	Building - 1	Concrete F	Fork Truck	Diesel	100	0.59	1.341698	1.363644	595.6582	0.005887	0.162832	0.149805	0.164573	0.235808
1	Building - 1	Concrete F	Tool Truck	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Concrete F	Tractor Tra	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Constructic	Survey Cre	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Constructic	Tractor Tra	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Roofing	High Lift	Diesel	100	0.59	1.341698	1.363644	595.6582	0.005887	0.162832	0.149805	0.164573	0.235808
1	Building - 1	Roofing	Man Lift	Diesel	75	0.21	5.103342	5.507219	692.7663	0.007926	0.735813	0.676948	1.066975	0.218094
1	Building - 1	Roofing	Material De	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Roofing	Tractor Tra	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Roofing	Truck Tow	Diesel	300	0.43	0.441375	2.067215	530.4611	0.00555	0.092158	0.084785	0.191928	0.557302
1	Building - 1	Security &	High Lift	Diesel	100	0.59	1.341698	1.363644	595.6582	0.005887	0.162832	0.149805	0.164573	0.235808
1	Building - 1	Security &	Tool Truck	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Structural S	90 Ton Cra	Diesel	300	0.43	0.441375	2.067215	530.4611	0.00555	0.092158	0.084785	0.191928	0.557302
1	Building - 1	Structural S	Concrete P	Diesel	11	0.43	4.510232	5.02368	588.184	0.006991	0.499497	0.459538	0.721233	0.029442
1	Building - 1	Structural S	Concrete T	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Structural S	Fork Truck	Diesel	100	0.59	1.341698	1.363644	595.6582	0.005887	0.162832	0.149805	0.164573	0.235808
1	Building - 1	Structural S	Tool Truck	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Structural S	Tractor Tra	Diesel	600	0.59	0.535781	1.426244	536.3688	0.005343	0.082943	0.076308	0.152419	1.030251
1	Building - 1	Structural S	Trowel Ma	Diesel	600	0.59	1.474698	3.351098	536.1147	0.005889	0.207128	0.190558	0.236287	1.390169
1	Building - 1	Structural S	Truck Tow	Diesel	300	0.43	0.441375	2.067215	530.4611	0.00555	0.092158	0.084785	0.191928	0.557302
2	Building - 1	Concrete F	Backhoe	Diesel	100	0.21	4.959582	3.982796	693.5211	0.005949	0.716339	0.659032	0.817811	1.070819
2	Building - 1	Concrete F	Concrete P	Diesel	11	0.43	4.487605	4.865857	588.2738	0.005479	0.473564	0.435679	0.691592	0.023734
2	Building - 1	Concrete F	Concrete R	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Concrete F	Excavator	Diesel	175	0.59	0.524682	1.27877	536.3261	0.004154	0.117405	0.108013	0.166495	0.398058
2	Building - 1	Concrete F	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
2	Building - 1	Concrete F	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Concrete F	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Constructic	Survey Cre	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Constructic	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Exterior Wa	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
2	Building - 1	Exterior Wa	Generator	Diesel	40	0.43	1.601245	4.439822	589.0974	0.005095	0.307127	0.282557	0.419672	0.077607
2	Building - 1	Exterior Wa	Grout Mixe	Diesel	600	0.59	1.322633	3.044187	536.1612	0.004526	0.186817	0.171872	0.220917	1.771948
2	Building - 1	Exterior Wa	Grout Whe	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Exterior Wa	Man Lift	Diesel	75	0.21	4.790546	5.294224	693.0019	0.006111	0.681905	0.627353	0.989167	0.292026
2	Building - 1	Exterior Wa	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Exterior Wa	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Exterior Wa	Truck Tow	Diesel	300	0.43	0.378963	1.749402	530.4989	0.004215	0.07787	0.07164	0.179439	0.646177
2	Building - 1	Interior Bui	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
2	Building - 1	Interior Bui	Man Lift	Diesel	75	0.21	4.790546	5.294224	693.0019	0.006111	0.681905	0.627353	0.989167	0.292026
2	Building - 1	Interior Bui	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Interior Bui	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Roofing	High Lift	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
2	Building - 1	Roofing	Man Lift	Diesel	75	0.21	4.790546	5.294224	693.0019	0.006111	0.681905	0.627353	0.989167	0.292026
2	Building - 1	Roofing	Material De	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Roofing	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Roofing	Truck Tow	Diesel	300	0.43	0.378963	1.749402	530.4989	0.004215	0.07787	0.07164	0.179439	0.646177
2	Building - 1	Security &	High Lift	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
2	Building - 1	Security &	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Structural S	90 Ton Cra	Diesel	300	0.43	0.378963	1.749402	530.4989	0.004215	0.07787	0.07164	0.179439	0.646177
2	Building - 1	Structural S	Concrete P	Diesel	11	0.43	4.487605	4.865857	588.2738	0.005479	0.473564	0.435679	0.691592	0.023734
2	Building - 1	Structural S	Concrete T	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Structural S	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
2	Building - 1	Structural S	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Structural S	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Building - 1	Structural S	Trowel Ma	Diesel	600	0.59	1.322633	3.044187	536.1612	0.004526	0.186817	0.171872	0.220917	1.771948
2	Building - 1	Structural S	Truck Tow	Diesel	300	0.43	0.378963	1.749402	530.4989	0.004215	0.07787	0.07164	0.179439	0.646177

2	Building - S	Concrete F	Backhoe	Diesel	100	0.21	4.959582	3.982796	693.5211	0.005949	0.716339	0.659032	0.817811	1.070819	
2	Building - S	Concrete F	Concrete R	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Concrete F	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017	
2	Building - S	Concrete F	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Concrete F	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Constructic	Survey Cre	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Constructic	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Exterior Wa	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017	
2	Building - S	Exterior Wa	Generator	Diesel	40	0.43	1.601245	4.439822	589.0974	0.005095	0.307127	0.282557	0.419672	0.077607	
2	Building - S	Exterior Wa	Man Lift	Diesel	75	0.21	4.790546	5.294224	693.0019	0.006111	0.681905	0.627353	0.989167	0.292026	
2	Building - S	Exterior Wa	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Exterior Wa	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Interior Bui	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017	
2	Building - S	Interior Bui	Man Lift	Diesel	75	0.21	4.790546	5.294224	693.0019	0.006111	0.681905	0.627353	0.989167	0.292026	
2	Building - S	Interior Bui	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Interior Bui	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Roofing	High Lift	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017	
2	Building - S	Roofing	Man Lift (F	Diesel	75	0.21	4.790546	5.294224	693.0019	0.006111	0.681905	0.627353	0.989167	0.292026	
2	Building - S	Roofing	Material De	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Roofing	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Security &	High Lift	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017	
2	Building - S	Security &	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Structural S	90 Ton Cra	Diesel	300	0.43	0.378963	1.749402	530.4989	0.004215	0.07787	0.07164	0.179439	0.646177	
2	Building - S	Structural S	Concrete P	Diesel	11	0.43	4.487605	4.865857	588.2738	0.005479	0.473564	0.435679	0.691592	0.023734	
2	Building - S	Structural S	Concrete T	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Structural S	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017	
2	Building - S	Structural S	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Structural S	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Building - S	Structural S	Trowel Mac	Diesel	600	0.59	1.322633	3.044187	536.1612	0.004526	0.186817	0.171872	0.220917	1.771948	
2	Cargo Apro	Asphalt Pla	Asphalt Pa	Diesel	175	0.59	0.70058	1.680451	536.2642	0.004311	0.162964	0.149927	0.186919	0.462248	
2	Cargo Apro	Asphalt Pla	Dump Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Asphalt Pla	Other Gene	Diesel	175	0.43	0.563108	2.142357	530.4145	0.004383	0.140168	0.128955	0.207327	0.452949	
2	Cargo Apro	Asphalt Pla	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Asphalt Pla	Roller	Diesel	100	0.59	2.029061	2.13465	595.4836	0.004834	0.26818	0.246725	0.222209	0.371907	
2	Cargo Apro	Asphalt Pla	Skid Steer	Diesel	75	0.21	5.260107	5.164189	692.7816	0.006112	0.790935	0.72766	1.061884	0.655641	
2	Cargo Apro	Asphalt Pla	Surfacing E	Diesel	25	0.59	2.469223	4.458573	594.7077	0.00554	0.357563	0.328958	0.478332	0.022191	
2	Cargo Apro	Clearing ar	Chain Saw	Diesel	11	0.7	293.535	1.322993	685.9964	0.140192	9.748189	8.968334	61.88835	25.55636	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
2	Cargo Apro	Clearing ar	Chipper/Stu	Diesel	100	0.43	2.080509	3.751584	589.0773	0.005078	0.372103	0.342335	0.426338	0.704959	
2	Cargo Apro	Clearing ar	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Concrete P	Air Compre	Diesel	100	0.43	1.547261	2.650318	589.5631	0.0049	0.238408	0.219335	0.265974	0.323721	
2	Cargo Apro	Concrete P	Concrete S	Diesel	40	0.59	0.892882	3.679516	595.5335	0.004791	0.142352	0.130964	0.205727	0.019506	
2	Cargo Apro	Concrete P	Concrete T	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Concrete P	Other Gene	Diesel	175	0.43	0.563108	2.142357	530.4145	0.004383	0.140168	0.128955	0.207327	0.452949	
2	Cargo Apro	Concrete P	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Concrete P	Rubber Tir	Diesel	175	0.59	0.751123	1.810228	536.2431	0.004353	0.175267	0.161246	0.19386	0.482836	
2	Cargo Apro	Concrete P	Slip Form F	Diesel	175	0.59	0.70058	1.680451	536.2642	0.004311	0.162964	0.149927	0.186919	0.462248	
2	Cargo Apro	Concrete P	Surfacing E	Diesel	25	0.59	2.469223	4.458573	594.7077	0.00554	0.357563	0.328958	0.478332	0.022191	
2	Cargo Apro	Drainage -	Dozer	Diesel	175	0.59	0.621021	1.489273	536.2943	0.004241	0.143021	0.13158	0.176976	0.441631	
2	Cargo Apro	Drainage -	Dump Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Drainage -	Excavator	Diesel	175	0.59	0.524682	1.27877	536.3261	0.004154	0.117405	0.108013	0.166495	0.398058	
2	Cargo Apro	Drainage -	Loader	Diesel	175	0.59	0.751123	1.810228	536.2431	0.004353	0.175267	0.161246	0.19386	0.482836	
2	Cargo Apro	Drainage -	Other Gene	Diesel	175	0.43	0.563108	2.142357	530.4145	0.004383	0.140168	0.128955	0.207327	0.452949	
2	Cargo Apro	Drainage -	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Drainage -	Roller	Diesel	100	0.59	2.029061	2.13465	595.4836	0.004834	0.26818	0.246725	0.222209	0.371907	
2	Cargo Apro	Drainage -	Dump Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Drainage -	Loader	Diesel	175	0.59	0.751123	1.810228	536.2431	0.004353	0.175267	0.161246	0.19386	0.482836	
2	Cargo Apro	Drainage -	Other Gene	Diesel	175	0.43	0.563108	2.142357	530.4145	0.004383	0.140168	0.128955	0.207327	0.452949	
2	Cargo Apro	Drainage -	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Drainage -	Tractors/Lo	Diesel	100	0.21	4.959582	3.982796	693.5211	0.005949	0.716339	0.659032	0.817811	1.070819	
2	Cargo Apro	Dust Contr	Water Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Excavation	Dozer	Diesel	175	0.59	0.621021	1.489273	536.2943	0.004241	0.143021	0.13158	0.176976	0.441631	
2	Cargo Apro	Excavation	Dump Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Excavation	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505	
2	Cargo Apro	Excavation	Roller	Diesel	100	0.59	2.029061	2.13465	595.4836	0.004834	0.26818	0.246725	0.222209	0.371907	

2	Cargo Apr	Excavation	Dozer	Diesel	175	0.59	0.621021	1.489273	536.2943	0.004241	0.143021	0.13158	0.176976	0.441631
2	Cargo Apr	Excavation	Dump Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Excavation	Excavator	Diesel	175	0.59	0.524682	1.27877	536.3261	0.004154	0.117405	0.108013	0.166495	0.398058
2	Cargo Apr	Excavation	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Excavation	Roller	Diesel	100	0.59	2.029061	2.13465	595.4836	0.004834	0.26818	0.246725	0.222209	0.371907
2	Cargo Apr	Excavation	Scraper	Diesel	600	0.59	0.821614	2.028631	536.3221	0.004352	0.123209	0.113352	0.167838	1.437191
2	Cargo Apr	Excavation	Dozer	Diesel	175	0.59	0.621021	1.489273	536.2943	0.004241	0.143021	0.13158	0.176976	0.441631
2	Cargo Apr	Fencing	Concrete T	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Fencing	Dump Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Fencing	Other Gen	Diesel	175	0.43	0.563108	2.142357	530.4145	0.004383	0.140168	0.128955	0.207327	0.452949
2	Cargo Apr	Fencing	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Fencing	Skid Steer	Diesel	75	0.21	5.260107	5.164189	692.7816	0.006112	0.790935	0.72766	1.061884	0.655641
2	Cargo Apr	Fencing	Tractors/Lo	Diesel	100	0.21	4.959582	3.982796	693.5211	0.005949	0.716339	0.659032	0.817811	1.070819
2	Cargo Apr	Grading	Dozer	Diesel	175	0.59	0.621021	1.489273	536.2943	0.004241	0.143021	0.13158	0.176976	0.441631
2	Cargo Apr	Grading	Grader	Diesel	300	0.59	0.418682	1.31341	536.3344	0.004094	0.076087	0.07	0.16373	0.533481
2	Cargo Apr	Grading	Roller	Diesel	100	0.59	2.029061	2.13465	595.4836	0.004834	0.26818	0.246725	0.222209	0.371907
2	Cargo Apr	Hydroseed	Hydroseed	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Hydroseed	Off-Road T	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Lighting	Dump Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Lighting	Loader	Diesel	175	0.59	0.751123	1.810228	536.2431	0.004353	0.175267	0.161246	0.19386	0.482836
2	Cargo Apr	Lighting	Other Gen	Diesel	175	0.43	0.563108	2.142357	530.4145	0.004383	0.140168	0.128955	0.207327	0.452949
2	Cargo Apr	Lighting	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Lighting	Skid Steer	Diesel	75	0.21	5.260107	5.164189	692.7816	0.006112	0.790935	0.72766	1.061884	0.655641
2	Cargo Apr	Lighting	Tractors/Lo	Diesel	100	0.21	4.959582	3.982796	693.5211	0.005949	0.716339	0.659032	0.817811	1.070819
2	Cargo Apr	Markings	Flatbed Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Markings	Other Gen	Diesel	175	0.43	0.563108	2.142357	530.4145	0.004383	0.140168	0.128955	0.207327	0.452949
2	Cargo Apr	Markings	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Sealing/Fu	Distributing	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Sealing/Fu	Other Gen	Diesel	175	0.43	0.563108	2.142357	530.4145	0.004383	0.140168	0.128955	0.207327	0.452949
2	Cargo Apr	Sealing/Fu	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Soil Erosio	Other Gen	Diesel	175	0.43	0.563108	2.142357	530.4145	0.004383	0.140168	0.128955	0.207327	0.452949
2	Cargo Apr	Soil Erosio	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Soil Erosio	Pumps	Diesel	11	0.43	4.487605	4.865857	588.2738	0.005479	0.473564	0.435679	0.691592	0.023734
2	Cargo Apr	Soil Erosio	Tractors/Lo	Diesel	100	0.21	4.959582	3.982796	693.5211	0.005949	0.716339	0.659032	0.817811	1.070819
2	Cargo Apr	Subbase P	Dozer	Diesel	175	0.59	0.621021	1.489273	536.2943	0.004241	0.143021	0.13158	0.176976	0.441631
2	Cargo Apr	Subbase P	Dump Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Subbase P	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Subbase P	Roller	Diesel	100	0.59	2.029061	2.13465	595.4836	0.004834	0.26818	0.246725	0.222209	0.371907
2	Cargo Apr	Topsoil Pla	Dozer	Diesel	175	0.59	0.621021	1.489273	536.2943	0.004241	0.143021	0.13158	0.176976	0.441631
2	Cargo Apr	Topsoil Pla	Dump Truc	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
2	Cargo Apr	Topsoil Pla	Pickup Tru	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
3	Building - 1	Interior Bui	Fork Truck	Diesel	100	0.59	0.509714	0.485604	595.7286	0.00291	0.029569	0.027203	0.141349	0.035732
3	Building - 1	Interior Bui	Man Lift	Diesel	75	0.21	4.47775	5.081228	693.2376	0.004296	0.627997	0.577757	0.91136	0.265616
3	Building - 1	Interior Bui	Tool Truck	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 1	Interior Bui	Tractor Tra	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 1	Roofing	High Lift	Diesel	100	0.59	0.509714	0.485604	595.7286	0.00291	0.029569	0.027203	0.141349	0.035732
3	Building - 1	Roofing	Man Lift (F	Diesel	75	0.21	4.47775	5.081228	693.2376	0.004296	0.627997	0.577757	0.91136	0.265616
3	Building - 1	Roofing	Material De	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 1	Roofing	Tractor Tra	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 1	Security &	High Lift	Diesel	100	0.59	0.509714	0.485604	595.7286	0.00291	0.029569	0.027203	0.141349	0.035732
3	Building - 1	Security &	Tool Truck	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Concrete F	Backhoe	Diesel	100	0.21	4.557147	3.625291	693.7839	0.004159	0.649179	0.597244	0.731048	0.940151
3	Building - 3	Concrete F	Concrete R	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Concrete F	Fork Truck	Diesel	100	0.59	0.509714	0.485604	595.7286	0.00291	0.029569	0.027203	0.141349	0.035732
3	Building - 3	Concrete F	Tool Truck	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Concrete F	Tractor Tra	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Constructic	Survey Cre	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Constructic	Tractor Tra	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Exterior Wa	Fork Truck	Diesel	100	0.59	0.509714	0.485604	595.7286	0.00291	0.029569	0.027203	0.141349	0.035732
3	Building - 3	Exterior Wa	Generator	Diesel	40	0.43	1.401663	4.269644	589.2646	0.003542	0.271979	0.25022	0.36449	0.061589
3	Building - 3	Exterior Wa	Man Lift	Diesel	75	0.21	4.47775	5.081228	693.2376	0.004296	0.627997	0.577757	0.91136	0.265616
3	Building - 3	Exterior Wa	Tool Truck	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Exterior Wa	Tractor Tra	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Interior Bui	Fork Truck	Diesel	100	0.59	0.509714	0.485604	595.7286	0.00291	0.029569	0.027203	0.141349	0.035732

3	Building - 3	Interior Bui	Man Lift	Diesel	75	0.21	4.47775	5.081228	693.2376	0.004296	0.627997	0.577757	0.91136	0.265616
3	Building - 3	Interior Bui	Tool Truck	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Interior Bui	Tractor Tra	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Roofing	High Lift	Diesel	100	0.59	0.509714	0.485604	595.7286	0.00291	0.029569	0.027203	0.141349	0.035732
3	Building - 3	Roofing	Man Lift (F	Diesel	75	0.21	4.47775	5.081228	693.2376	0.004296	0.627997	0.577757	0.91136	0.265616
3	Building - 3	Roofing	Material De	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Roofing	Tractor Tra	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Security &	High Lift	Diesel	100	0.59	0.509714	0.485604	595.7286	0.00291	0.029569	0.027203	0.141349	0.035732
3	Building - 3	Security &	Tool Truck	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Structural S	90 Ton Cra	Diesel	300	0.43	0.316551	1.43159	530.5367	0.002879	0.063582	0.058495	0.16695	0.486425
3	Building - 3	Structural S	Concrete P	Diesel	11	0.43	4.464978	4.708033	588.3636	0.003966	0.447631	0.411821	0.661952	0.018666
3	Building - 3	Structural S	Concrete T	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Structural S	Fork Truck	Diesel	100	0.59	0.509714	0.485604	595.7286	0.00291	0.029569	0.027203	0.141349	0.035732
3	Building - 3	Structural S	Tool Truck	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Structural S	Tractor Tra	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Building - 3	Structural S	Trowel Ma	Diesel	600	0.59	1.170568	2.737276	536.2078	0.003164	0.166506	0.153185	0.205546	1.533539
3	Landscapir	Hydroseed	Hydroseed	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Landscapir	Hydroseed	Off-Road T	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Landscapir	Mulching	Dump Truc	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Landscapir	Mulching	Other Gen	Diesel	175	0.43	0.489977	1.797358	530.4648	0.00301	0.122123	0.112354	0.190729	0.3657
3	Landscapir	Mulching	Pickup Tru	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Landscapir	Mulching	Tractors/Lo	Diesel	100	0.21	4.557147	3.625291	693.7839	0.004159	0.649179	0.597244	0.731048	0.940151
3	Landscapir	Sodding	Flatbed Tru	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Landscapir	Sodding	Other Gen	Diesel	175	0.43	0.489977	1.797358	530.4648	0.00301	0.122123	0.112354	0.190729	0.3657
3	Landscapir	Sodding	Pickup Tru	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Landscapir	Sodding	Skid Steer	Diesel	75	0.21	4.902492	4.976788	693.0439	0.004298	0.731666	0.673133	0.975304	0.594886
3	Landscapir	Topsoil Pla	Dozer	Diesel	175	0.59	0.492297	1.155007	536.339	0.002852	0.111014	0.102133	0.162233	0.297136
3	Landscapir	Topsoil Pla	Dump Truc	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
3	Landscapir	Topsoil Pla	Pickup Tru	Diesel	600	0.59	0.266379	0.824782	536.3967	0.002684	0.034262	0.031521	0.143202	0.465137
4	Building - 3	Concrete F	Backhoe	Diesel	100	0.21	4.959582	3.982796	693.5211	0.005949	0.716339	0.659032	0.817811	1.070819
4	Building - 3	Concrete F	Concrete R	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Concrete F	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
4	Building - 3	Concrete F	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Concrete F	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Constructic	Survey Cre	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Constructic	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Exterior Wa	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
4	Building - 3	Exterior Wa	Generator	Diesel	40	0.43	1.601245	4.439822	589.0974	0.005095	0.307127	0.282557	0.419672	0.077607
4	Building - 3	Exterior Wa	Man Lift	Diesel	75	0.21	4.790546	5.294224	693.0019	0.006111	0.681905	0.627353	0.989167	0.292026
4	Building - 3	Exterior Wa	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Exterior Wa	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Roofing	High Lift	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
4	Building - 3	Roofing	Man Lift (F	Diesel	75	0.21	4.790546	5.294224	693.0019	0.006111	0.681905	0.627353	0.989167	0.292026
4	Building - 3	Roofing	Material De	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Roofing	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Structural S	90 Ton Cra	Diesel	300	0.43	0.378963	1.749402	530.4989	0.004215	0.07787	0.07164	0.179439	0.646177
4	Building - 3	Structural S	Concrete P	Diesel	11	0.43	4.487605	4.865857	588.2738	0.005479	0.473564	0.435679	0.691592	0.023734
4	Building - 3	Structural S	Concrete T	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Structural S	Fork Truck	Diesel	100	0.59	0.925706	0.924624	595.6934	0.004398	0.0962	0.088504	0.152961	0.190017
4	Building - 3	Structural S	Tool Truck	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Structural S	Tractor Tra	Diesel	600	0.59	0.40108	1.125513	536.3827	0.004013	0.058603	0.053915	0.147811	0.977505
4	Building - 3	Structural S	Trowel Ma	Diesel	600	0.59	1.322633	3.044187	536.1612	0.004526	0.186817	0.171872	0.220917	1.771948

Emission Factors: On-Road (from MOVES)

Scenario ID	Project Typ	Equipment	Fuel Type	Roadway T	CO(g/mi)	NOx(g/mi)	CO2(g/mi)	SO2(g/mi)	PM10(g/mi	PM2.5(g/m	CH4(g/mi)	N2O(g/mi)	VOC(g/mi)	RV CO(g/v	RV NOx(g/	RV CO2(g/	RV SO2(g/	RV PM10(g	RV PM2.5(	RV VOC(g/
1	Building - 1	Cement Mi	Diesel	Urban Unre	1.259738	3.410548	1249.195	0.008947	0.148013	0.143577	0.367323	0.065406	0.003462	19.76756	6.227559	318.8403	0.002374	0.028671	0.027812	2.569423
1	Building - 1	Dump Truc	Diesel	Urban Unre	1.259738	3.410548	1249.195	0.008947	0.148013	0.143577	0.367323	0.065406	0.003462	19.76756	6.227559	318.8403	0.002374	0.028671	0.027812	2.569423
1	Building - 1	Passenger	Gasoline	Urban Unre	3.966694	0.254596	372.5344	0.006788	0.013365	0.012307	0.107975	0.004983	0.002252	200.4027	4.823958	718.084	0.013084	0.168121	0.154807	10.34794
1	Building - 1	Tractor Tra	Diesel	Urban Unre	2.137945	7.870389	2328.796	0.016943	0.416884	0.404391	0.476271	0.058861	0.003461	24.15675	7.832895	410.3264	0.003143	0.050035	0.048536	10.27649
2	Building - 1	Cement Mi	Diesel	Urban Unre	1.098333	2.756558	1286.983	0.009139	0.121211	0.117579	0.313444	0.067114	0.003463	17.7088	1.301041	241.5881	0.001783	0.025398	0.024637	1.400109
2	Building - 1	Dump Truc	Diesel	Urban Unre	1.098333	2.756558	1286.983	0.009139	0.121211	0.117579	0.313444	0.067114	0.003463	17.7088	1.301041	241.5881	0.001783	0.025398	0.024637	1.400109
2	Building - 1	Passenger	Gasoline	Urban Unre	2.090126	0.204577	375.5323	0.006476	0.005471	0.005038	0.087864	0.004679	0.00204	37.89401	3.240991	407.9617	0.007035	0.046505	0.042822	6.532304

2	Building - 1	Tractor Tra	Diesel	Urban Unre	1.842562	6.341291	2382.533	0.01716	0.348237	0.337801	0.41733	0.061663	0.003462	21.5696	2.173301	316.9745	0.00241	0.046279	0.044893	10.84526
2	Building - 3	Cement Mi	Diesel	Urban Unre	1.098333	2.756558	1286.983	0.009139	0.121211	0.117579	0.313444	0.067114	0.003463	17.7088	1.301041	241.5881	0.001783	0.025398	0.024637	1.400109
2	Building - 3	Dump Truc	Diesel	Urban Unre	1.098333	2.756558	1286.983	0.009139	0.121211	0.117579	0.313444	0.067114	0.003463	17.7088	1.301041	241.5881	0.001783	0.025398	0.024637	1.400109
2	Building - 3	Passenger	Gasoline	Urban Unre	2.090126	0.204577	375.5323	0.006476	0.005471	0.005038	0.087864	0.004679	0.00204	37.89401	3.240991	407.9617	0.007035	0.046505	0.042822	6.532304
2	Building - 3	Tractor Tra	Diesel	Urban Unre	1.842562	6.341291	2382.533	0.01716	0.348237	0.337801	0.41733	0.061663	0.003462	21.5696	2.173301	316.9745	0.00241	0.046279	0.044893	10.84526
2	Cargo Apro	Asphalt 18	Diesel	Urban Unre	1.842562	6.341291	2382.533	0.01716	0.348237	0.337801	0.41733	0.061663	0.003462	21.5696	2.173301	316.9745	0.00241	0.046279	0.044893	10.84526
2	Cargo Apro	Cement Mi	Diesel	Urban Unre	1.098333	2.756558	1286.983	0.009139	0.121211	0.117579	0.313444	0.067114	0.003463	17.7088	1.301041	241.5881	0.001783	0.025398	0.024637	1.400109
2	Cargo Apro	Dump Truc	Diesel	Urban Unre	1.098333	2.756558	1286.983	0.009139	0.121211	0.117579	0.313444	0.067114	0.003463	17.7088	1.301041	241.5881	0.001783	0.025398	0.024637	1.400109
2	Cargo Apro	Dump Truc	Diesel	Urban Unre	1.098333	2.756558	1286.983	0.009139	0.121211	0.117579	0.313444	0.067114	0.003463	17.7088	1.301041	241.5881	0.001783	0.025398	0.024637	1.400109
2	Cargo Apro	Passenger	Gasoline	Urban Unre	2.090126	0.204577	375.5323	0.006476	0.005471	0.005038	0.087864	0.004679	0.00204	37.89401	3.240991	407.9617	0.007035	0.046505	0.042822	6.532304
3	Building - 1	Cement Mi	Diesel	Urban Unre	0.405183	1.027492	1287.06	0.008808	0.017086	0.016574	0.080324	0.07126	0.003464	17.68767	1.300782	242.8373	0.001662	0.00012	0.000116	1.1846
3	Building - 1	Dump Truc	Diesel	Urban Unre	0.405183	1.027492	1287.06	0.008808	0.017086	0.016574	0.080324	0.07126	0.003464	17.68767	1.300782	242.8373	0.001662	0.00012	0.000116	1.1846
3	Building - 1	Passenger	Gasoline	Urban Unre	1.838582	0.07978	323.1771	0.005573	0.005222	0.004808	0.05418	0.004397	0.001668	31.65737	1.614443	346.387	0.005973	0.040652	0.037432	5.285132
3	Building - 1	Tractor Tra	Diesel	Urban Unre	0.458113	1.715499	2382.87	0.016306	0.037571	0.036445	0.123844	0.072776	0.003464	21.53336	2.172695	319.354	0.002185	0.000158	0.000153	13.12443
3	Building - 3	Cement Mi	Diesel	Urban Unre	0.405183	1.027492	1287.06	0.008808	0.017086	0.016574	0.080324	0.07126	0.003464	17.68767	1.300782	242.8373	0.001662	0.00012	0.000116	1.1846
3	Building - 3	Dump Truc	Diesel	Urban Unre	0.405183	1.027492	1287.06	0.008808	0.017086	0.016574	0.080324	0.07126	0.003464	17.68767	1.300782	242.8373	0.001662	0.00012	0.000116	1.1846
3	Building - 3	Passenger	Gasoline	Urban Unre	1.838582	0.07978	323.1771	0.005573	0.005222	0.004808	0.05418	0.004397	0.001668	31.65737	1.614443	346.387	0.005973	0.040652	0.037432	5.285132
3	Building - 3	Tractor Tra	Diesel	Urban Unre	0.458113	1.715499	2382.87	0.016306	0.037571	0.036445	0.123844	0.072776	0.003464	21.53336	2.172695	319.354	0.002185	0.000158	0.000153	13.12443
3	Landscapir	Flatbed Tru	Diesel	Urban Unre	0.458113	1.715499	2382.87	0.016306	0.037571	0.036445	0.123844	0.072776	0.003464	21.53336	2.172695	319.354	0.002185	0.000158	0.000153	13.12443
3	Landscapir	Passenger	Gasoline	Urban Unre	1.838582	0.07978	323.1771	0.005573	0.005222	0.004808	0.05418	0.004397	0.001668	31.65737	1.614443	346.387	0.005973	0.040652	0.037432	5.285132
4	Building - 3	Cement Mi	Diesel	Urban Unre	1.098333	2.756558	1286.983	0.009139	0.121211	0.117579	0.313444	0.067114	0.003463	17.7088	1.301041	241.5881	0.001783	0.025398	0.024637	1.400109
4	Building - 3	Dump Truc	Diesel	Urban Unre	1.098333	2.756558	1286.983	0.009139	0.121211	0.117579	0.313444	0.067114	0.003463	17.7088	1.301041	241.5881	0.001783	0.025398	0.024637	1.400109
4	Building - 3	Passenger	Gasoline	Urban Unre	2.090126	0.204577	375.5323	0.006476	0.005471	0.005038	0.087864	0.004679	0.00204	37.89401	3.240991	407.9617	0.007035	0.046505	0.042822	6.532304
4	Building - 3	Tractor Tra	Diesel	Urban Unre	1.842562	6.341291	2382.533	0.01716	0.348237	0.337801	0.41733	0.061663	0.003462	21.5696	2.173301	316.9745	0.00241	0.046279	0.044893	10.84526

Fugitive Emissions (Emission Factors from Various Sources including AP-42)

Scenario ID	Project	Fugitive Ty	Variable	Default Val	Units	User Value
1	Building - 1	Concrete M	V = Volume	4625	yd3	
1	Building - 1	Concrete M	PM10 = 0.0	171.1	lbs	
1	Building - 1	Material Mo	sL = Road	0.1	g/m3	
1	Building - 1	Material Mo	Wt. = Mear	32	tons	
1	Building - 1	Material Mo	VMT = Veh	2580	miles	
1	Building - 1	Material Mo	PM10 = 0.0	23.9	lbs	
1	Building - 1	Material Mo	s = Surface	0.043	fraction	
1	Building - 1	Material Mo	Wt. = Mear	32	tons	
1	Building - 1	Material Mo	VMT = Veh	2680	miles	
1	Building - 1	Material Mo	PM10 = 1.5	73.4	lbs	
2	Building - 1	Concrete M	V = Volume	4625	yd3	
2	Building - 1	Concrete M	PM10 = 0.0	171.1	lbs	
2	Building - 1	Material Mo	sL = Road	0.1	g/m3	
2	Building - 1	Material Mo	Wt. = Mear	32	tons	
2	Building - 1	Material Mo	VMT = Veh	3870	miles	
2	Building - 1	Material Mo	PM10 = 0.0	35.9	lbs	
2	Building - 1	Material Mo	s = Surface	0.043	fraction	
2	Building - 1	Material Mo	Wt. = Mear	32	tons	
2	Building - 1	Material Mo	VMT = Veh	3970	miles	
2	Building - 1	Material Mo	PM10 = 1.5	108.7	lbs	
2	Building - 3	Concrete M	V = Volume	1387.5	yd3	
2	Building - 3	Concrete M	PM10 = 0.0	51.3	lbs	
2	Building - 3	Material Mo	sL = Road	0.1	g/m3	
2	Building - 3	Material Mo	Wt. = Mear	32	tons	
2	Building - 3	Material Mo	VMT = Veh	2580	miles	
2	Building - 3	Material Mo	PM10 = 0.0	23.9	lbs	
2	Building - 3	Material Mo	s = Surface	0.043	fraction	
2	Building - 3	Material Mo	Wt. = Mear	32	tons	
2	Building - 3	Material Mo	VMT = Veh	2580	miles	
2	Building - 3	Material Mo	PM10 = 1.5	70.7	lbs	
2	Cargo Apro	Asphalt Dry	A = Area of	1393.5	m2	
2	Cargo Apro	Asphalt Dry	AR = Appli	1.811	l/m2	
2	Cargo Apro	Asphalt Dry	VD = Volur	0.35	fraction	
2	Cargo Apro	Asphalt Dry	EF = Mass	0.7	fraction	
2	Cargo Apro	Asphalt Dry	D = Density	1.8	lbs/l	
2	Cargo Apro	Asphalt Dry	VOC = A x	1112.9	lbs	

2	Cargo Aprc	Asphalt Stc	T = Mass o	181.3	tons
2	Cargo Aprc	Asphalt Stc	PM10 = (0.	4.971	lbs
2	Cargo Aprc	Asphalt Stc	CO = (0.4 -	72.6	lbs
2	Cargo Aprc	Asphalt Stc	NOx = (0.0	4.532	lbs
2	Cargo Aprc	Asphalt Stc	SOx = (0.0	0.834	lbs
2	Cargo Aprc	Asphalt Stc	VOC = (0.0	2.248	lbs
2	Cargo Aprc	Material Mc	s = Surface	0.043	fraction
2	Cargo Aprc	Material Mc	Wt. = Mear	32	tons
2	Cargo Aprc	Material Mc	VMT = Veh	5219.2	miles
2	Cargo Aprc	Material Mc	PM10 = 1.5	142.9	lbs
2	Cargo Aprc	Material Mc	sL = Road	0.1	g/m3
2	Cargo Aprc	Material Mc	Wt. = Mear	32	tons
2	Cargo Aprc	Material Mc	VMT = Veh	5160	miles
2	Cargo Aprc	Material Mc	PM10 = 0.0	47.9	lbs
2	Cargo Aprc	Concrete M	V = Volume	693.8	yd3
2	Cargo Aprc	Concrete M	PM10 = 0.0	25.7	lbs
2	Cargo Aprc	Unstabilize	A = Area at	0.344	acres
2	Cargo Aprc	Unstabilize	TPConv =	0.5	fraction
2	Cargo Aprc	Unstabilize	CE = Contr	0.63	fraction
2	Cargo Aprc	Unstabilize	t = year (e.	1	years
2	Cargo Aprc	Unstabilize	PM10 = 0.3	0	lbs
2	Cargo Aprc	Soil Handli	u = Wind sp	5	mph
2	Cargo Aprc	Soil Handli	m = Moistu	0.25	fraction
2	Cargo Aprc	Soil Handli	T = Mass o	412.5	tons
2	Cargo Aprc	Soil Handli	PM10 = T x	8.491	lbs
3	Building - 1	Material Mc	sL = Road	0.1	g/m3
3	Building - 1	Material Mc	Wt. = Mear	32	tons
3	Building - 1	Material Mc	VMT = Veh	2580	miles
3	Building - 1	Material Mc	PM10 = 0.0	23.9	lbs
3	Building - 3	Concrete M	V = Volume	1387.5	yd3
3	Building - 3	Concrete M	PM10 = 0.0	51.3	lbs
3	Building - 3	Material Mc	sL = Road	0.1	g/m3
3	Building - 3	Material Mc	Wt. = Mear	32	tons
3	Building - 3	Material Mc	VMT = Veh	2580	miles
3	Building - 3	Material Mc	PM10 = 0.0	23.9	lbs
3	Building - 3	Material Mc	s = Surface	0.043	fraction
3	Building - 3	Material Mc	Wt. = Mear	32	tons
3	Building - 3	Material Mc	VMT = Veh	2580	miles
3	Building - 3	Material Mc	PM10 = 1.5	70.7	lbs
3	Landscapir	Material Mc	s = Surface	0.043	fraction
3	Landscapir	Material Mc	Wt. = Mear	32	tons
3	Landscapir	Material Mc	VMT = Veh	1.018	miles
3	Landscapir	Material Mc	PM10 = 1.5	0.028	lbs
3	Landscapir	Material Mc	sL = Road	0.1	g/m3
3	Landscapir	Material Mc	Wt. = Mear	32	tons
3	Landscapir	Material Mc	VMT = Veh	0	miles
3	Landscapir	Material Mc	PM10 = 0.0	0	lbs
3	Landscapir	Soil Handli	u = Wind sp	5	mph
3	Landscapir	Soil Handli	m = Moistu	0.25	fraction
3	Landscapir	Soil Handli	T = Mass o	137.5	tons
3	Landscapir	Soil Handli	PM10 = T x	2.83	lbs
4	Building - 3	Concrete M	V = Volume	1387.5	yd3
4	Building - 3	Concrete M	PM10 = 0.0	51.3	lbs
4	Building - 3	Material Mc	sL = Road	0.1	g/m3
4	Building - 3	Material Mc	Wt. = Mear	32	tons
4	Building - 3	Material Mc	VMT = Veh	2580	miles
4	Building - 3	Material Mc	PM10 = 0.0	23.9	lbs
4	Building - 3	Material Mc	s = Surface	0.043	fraction
4	Building - 3	Material Mc	Wt. = Mear	32	tons
4	Building - 3	Material Mc	VMT = Veh	2580	miles
4	Building - 3	Material Mc	PM10 = 1.5	70.7	lbs

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ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES 2010b, revised January 2013

Non-Road Equipment: NONROAD2008a, July 2009

In addition to the overall project size dimensions (e.g., Length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

For calculating fugitive, re-entrained PM emissions from on-road and non-road material delivery and handling equipment, a nominal VMT of 5 miles is used for each vehicle per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

Fugitive emissions are only modeled for:

- Asphalt drying
- Asphalt storage and batching
- Concrete mixing/batching
- Soil handling
- Unstabilized land and wind erosion
- Material movement (unpaved roads)
- Material movement (paved roads)

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the aphalt item and select the corresponding concrete

Two trips per day were assumed for each on-road material handling trucks.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

The following equipment are always modeled using diesel emission factors since gasoline-based emission factors are not available:

- Asphalt Deliveries/Ten Wheelers
- Bulldozer
- Concrete Ready Mix Trucks
- Concrete Ready Trucks Mix for Cores
- Concrete Truck
- Crack Filler (Trailer Mounted)
- Delivery of Tanks (3)
- Distributing Tanker
- Dozer
- Dump Truck
- Dump Truck (12 cy)
- Excavator
- Excavator for U/G Services/Tanks
- Flat Bed or Dump Trucks

Flatbed Truck
Grader
Grout Wheel Truck
Hoist Equipment with 40 Ton Rig
Hydralic Hammer
Hydroseeder
Line Painting Truck and Sprayer
Material Deliveries
Off-Road Truck
Pickup Truck
Scraper
Seed Truck Spreader
Small Dozer
Survey Crew Trucks
Ten Wheelers
Ten Wheelers- Material Delivery
Tool Truck
Tractor Trailer- Equipment Delivery
Tractor Trailer- Material Delivery
Tractor Trailer- Steel Deliveries
Tractor Trailer- Stone Delivery
Tractor Trailer- Topsoil & Seed
Tractor Trailer- Truck Delivery
Tractor Trailer with Boom Hoist- Curbs Del & Place
Tractor Trailer with Boom Hoist- Delivery
Tractor Trailers- Rebar Deliveries
Tractor Trailers Temp Fac.
Truck for Topsoil & Seed Del&Spread
Water Truck
Excavator with Bucket
Excavator with Hoe Ram

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