

SEATTLE PUBLIC UTILITIES
SEPA ENVIRONMENTAL CHECKLIST

This SEPA environmental review of Seattle Public Utilities' 2017 Spot Sewer Rehabilitation and 5th Ave S Sewer Replacement Projects has been conducted in accord with the Washington State Environmental Policy Act (SEPA) (RCW 43.21C), State SEPA regulations [Washington Administrative Code (WAC) Chapter 197-11], and the City of Seattle SEPA ordinance [Seattle Municipal Code (SMC) Chapter 25.05].

A. BACKGROUND

1. Name of proposed project:

2017 Spot Sewer Rehabilitation Contract 1, sites 2 and 13; Contract 3, sites 6 and 8; and 5th Ave S Sewer Replacement Projects

2. Name of applicant:

Seattle Public Utilities (SPU)

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

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4. Date checklist prepared:

August 1, 2019

5. Agency requesting checklist:

Seattle Public Utilities (SPU)

6. Proposed timing or schedule (including phasing, if applicable):

Construction at all five work sites is anticipated to occur in April 2020. Construction at the 5th Avenue Sewer Replacement work site is anticipated to require approximately 60 working days. Construction at each of the other four work sites is anticipated to require up to five working days.

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

SPU has no plans for future additions, expansion, or further activity related to or connected with any of the work sites included in this Checklist.

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

SPU Geotechnical Engineering. 2015 (March). Geotechnical Investigation for 5th Avenue South Sewer Full Line Replacement Project, Seattle.

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

SPU is not aware of pending government approvals of other proposals that directly affect the property or rights-of-way affected by this proposal.

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

Seattle Department of Transportation (SDOT) Street Use Permit.

SDOT Utility Major Permit is required for the 5th Ave S Sewer Replacement.

Seattle Department of Construction and Inspections (SDCI) Exemption from the Shoreline Substantial Development Permit (SSDP) will be required for work at the Contract 1 Site 2 work site.

SPU must demonstrate compliance with the City of Seattle’s environmentally critical area regulations (SMC 25.09).

King County Wastewater Discharge Permit from King County Wastewater Treatment Division for groundwater and stormwater collected during construction and discharged to King County’s wastewater system.

Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW) is required for work at Contract 1 Site 13 because the targeted drainage pipe conveys a regulated watercourse (Durham Creek or tributary).

11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

SPU’s Spot Sewer Rehabilitation Program is used to relatively quickly resolve small wastewater and drainage problems throughout City of Seattle. These problems range from nuisance problems to property damage. Generally, the Program repairs broken sewer pipes (and sometimes storm drains) in City-owned street rights-of-way or City easements on private property. This “spot repair” work typically includes (but is not limited to) excavation, replacement of broken pipe segments and pipe fittings, bedding, disposal of excavated material, dewatering, backfilling, closed-circuit television inspection after repair is done, bypass pumping of drainage and wastewater, and restoration of disturbed ground and damaged and demolished paved surfaces.

To obtain efficiencies in the contracting and construction of these repairs, SPU bundles individual, unrelated spot repairs and full line sewer replacements into a single construction

bid document. Contractors then bid on the packaged set of repairs and the successful bidder conducts the repairs as specified in contract documents. SPU is currently preparing the 2017 Spot Sewer Rehabilitation Contracts 1 and 3 packages that bundle rehabilitation projects in street rights-of-way and easements across the City.

In some cases, a sewer pipe may require more than a spot repair and may need to be replaced by excavating the existing pipe and installing new pipe. SPU is currently preparing a Full Line Sewer Replacement Contract package. One site from that Contract package (5th Ave S Sewer Replacement) is included in this proposed work.

This SEPA environmental review includes five separate work sites: Contract 1 Sites 2 and 13 projects, Contract 3 Sites 6 and 8, and the 5th Ave S Sewer Replacement projects. A summary of the proposed work at each site is provided below.

- **Contract 1 Site 2 (C317018):** Repair 15-inch diameter mainline and redirect side sewer around mainline pipe located 109 feet upstream of maintenance hole (MH) structure 059-432.
- **Contract 1 Site 13 (C317018):** Repair corrugated metal pipe standpipe access MH structure D078-171.
- **Contract 3 Site 6 (C317035):** Install new MH at stub location 224-369, which is associated with two 8-inch diameter and 10- and 18-inch diameter sewer pipes.
- **Contract 3 Site 8 (C317035):** Install MH in line with 36-inch diameter mainline on 36th Ave S (MH 059-127) approximately 219 feet downstream from upstream MH 059-128. Install cured-in-place pipe liner for 8-inch diameter clay sewer mainline for approximately 219 feet from MH 059-128 to MH 059-127. Re-instate active lateral connections.
- **5th Ave S Sewer Replacement (C317034):** Replace in-kind approximately 620 linear feet of 15-inch diameter sewer. Reconnect existing lateral connections. Depth of the proposed pipe ranges from 5 to 12.5 feet below existing grade.

12. 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.

All work sites are in City of Seattle street rights-of-way. Vicinity maps for these five work sites are included as Attachments A, B, and C.

Addresses of a private property adjacent to the proposed work sites are:

- **Contract 1 Site 2:** 4002 49th Ave S
- **Contract 1 Site 13:** 9401 Myers Way S
- **Contract 3 Site 6:** 796 NW Carkeek Park Rd
- **Contract 3 Site 8:** 3622 S Adams St
- **5th Ave S Sewer Replacement:** This work site is in the City of Seattle's South Park neighborhood, in the street right-of-way for 5th Ave S between S Henderson St and S Concord St and between S Donovan St and S Trenton St. There is no specific address

for this project, which is in the northwest and southwest quarters of Section 32, Township 24N, Range 4E.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site: *[Check the applicable boxes]*

Flat Rolling Hilly Steep Slopes Mountainous Other:

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

Contract 1 Site 2 and Contract 3 Site 8 are flat sites having grades of less than 5 percent. Contract 1-Site 13, and Contract 3-Site 6 are adjacent to areas mapped as steep slopes (more than 40 percent) by SDCI; however, slopes within these work sites are approximately 0-15 percent. The 5th Ave S work site is flat, having a grade change from approximately 25 ft at the south end to 16 ft at the north end.

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 these soils.

Site	Soils
Contract 1 Site 2	Vashon subglacial till
Contract 1 Site 13	Fill overlying dense Vashon advance outwash
Contract 3 Site 6	Landslide deposits and dense Vashon advance outwash deposits
Contract 3 Site 8	Vashon advance outwash
5th Ave S	Loose fill overlying Alluvium deposits consisting loose sand to dense sandy silt to very soft clays.

The general geologic condition of the Puget Sound region is a result of glacial and non-glacial activity that occurred over the course of millennia. Review of the geologic map covering the work sites (Troost et al. 2005, available at <http://pubs.usgs.gov/of/2005/1252/>) indicates the work sites are underlain primarily by younger glacial deposits, including Vashon subglacial till, Vashon recessional or advance outwash deposits, or Vashon recessional coarse-grained deposits.

Urban development in this area over the last 100 years has resulted in a predominance of disturbed native soils/sediments, cut slopes, and placements of fill material. The work sites and immediately surrounding areas have been completely developed and disturbed in this way. No agricultural lands of commercial significance are near the work sites.

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

The City of Seattle designates geologically hazardous areas as Environmentally Critical Areas (ECAs) based on a historical and current geologic conditions, including topography and underlying soils. According to the City's GIS data, Contract 3 Site 6 is adjacent to steep slopes over 40 percent and approximately 100 feet northeast of a known slide

area. Contract 3 Site 8 and the 5th Ave S work sites are in mapped liquefaction-prone areas.

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

Excavation, fill, and grading at the four spot repair sites would be minimal occur in existing improved street rights-of-way that are currently paved with concrete, asphalt, and gravel. Backfill materials would include clean fill bedding material and native excavated material. Imported fill materials would be obtained from a commercial purveyor of such materials, licensed and permitted by the State of Washington. Exported excavated soil materials would be either reused on other projects or disposed of in an SPU-approved upland disposal location per construction contract requirements. Volume of excavation for three of the four spot repair sites is estimated to be no more than 30 cubic yards per site. Volume of excavation for one of the four spot repair sites is estimated to be 60 cubic yards. Thus, the total volume of fill for the spot repair sites is estimated to be no more than 150 cubic yards. Excavation and backfill are anticipated to balance, resulting in no net change in the existing soil surface. The total area of disturbed ground is estimated to be 400 square feet. All right-of-way surfaces would be restored to pre-construction conditions following project completion.

The 5th Ave S Sewer Replacement work site would require excavating approximately 1,300 cubic yards of soil or material and backfilling with approximately 1,300 cubic yards of native soil, pipe bedding (aggregate), pipe, and other fill material. At this time, about 1,300 cubic yards of spoil are expected to be exported from all work sites collectively. Imported fill materials would be obtained from a commercial purveyor of such materials, licensed and permitted by the State of Washington. Exported excavated soil materials would be either reused on other projects or disposed of in an SPU-approved upland disposal location per construction contract requirements. The total area of disturbed pavement is estimated to be 6,200 sq ft. All right-of-way surfaces would be restored to pre-construction conditions following project completion.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe:

Ground disturbance and vegetation trimming will be limited to that required for construction staging and access. Such areas will be in existing paved areas wherever possible. Because of the limited ground disturbance at all five work sites, potential for erosion is minimal. Erosion and sedimentation could occur as a result of construction, although this risk is low because the work sites are flat or nearly so and temporary erosion and sediment control best management practices (BMPs) would be deployed, inspected, and maintained as needed during construction. Disturbed paved areas would be restored to their near-original conditions.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Most of the proposed work is located within existing impervious areas. Approximately 8,300 sq ft of existing paved surfaces damaged or demolished by construction would be

repaired or replaced. The proposed work would not result in an increase or decrease in impervious surfaces.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Best Management Practices (BMPs) would be used to protect the existing stormwater drainage systems and to minimize erosion and sedimentation. A temporary erosion and sedimentation control plan would be prepared and implemented. BMPs as identified in the City of Seattle’s Stormwater Code (Seattle Municipal Code Title 22, Subtitle VIII), the City of Seattle Director’s Rule SDCI 17-2017/SPU DWW-200, and Volume 2 Construction Stormwater Control Manual would be used to manage stormwater runoff, construction disturbance, and erosion during construction.

2. Air

a. What types of emissions to the air would result from the proposal [e.g., dust, automobile, odors, industrial wood smoke, greenhouse gases (GHG)] during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

This proposed work would generate GHG emissions during the maximum total estimated 20 working-day construction period for the spot repair work sites and the 60-working day period for the 5th Ave S work site through the operation of diesel- and gasoline-powered equipment and to transport materials, equipment, and workers to and from the work sites. Generated emissions due to the combustion of gasoline and diesel fuels would include oxides of nitrogen, carbon monoxide, particulate matter and smoke, uncombusted hydrocarbons, hydrogen sulfide, carbon dioxide, particulates, and water vapor. Emissions during construction would also include dust from ground-disturbing activities but are expected to be minimal, localized, and temporary.

This proposed work would generate greenhouse gas (GHG) emissions through construction activity only. During operation, the completed work is not expected to generate GHG emissions because the repaired and replaced pipe segments are not expected to require maintenance for approximately 50 years. Total GHG emissions associated with construction are estimated to be about 35.15 metric tons of carbon dioxide emission (MTCO_{2e}) for the spot repair work sites and 499.2 metric tons for the 5th Ave S work site. The GHG emission calculations are shown in Attachment D and summarized in the table below. One metric ton is equal to approximately 2,205 pounds. Because construction methods were not completely known at the time this checklist was prepared, the estimates provided here are based on daily vehicle operation times for the maximum estimated duration; actual times may be less. Estimates are also based on typical transportation and construction equipment used for this type of work. Also, embodied energy in materials used in this proposed work has not been estimated as part of this SEPA environmental review due to the difficulty and inaccuracy inherent in preparing those estimates.

Summary of Greenhouse Gas (GHG) Emissions
(combined for both Spot Sewer and Full Line projects)

Activity/Emission Type	GHG Emissions (pounds of CO ₂ e) ¹	GHS Emissions (metric tons of CO ₂ e) ¹
Buildings	0	0
Paving	914,909	415
Construction Activities (Diesel)	235,339	106.73
Construction Activities (Gasoline)	27,798.8	12.6
Long-term Maintenance (Diesel)	0	0
Long-term Maintenance (Gasoline)	0	0
Total GHG Emissions	1,178,046.8	534.33

¹Note: 1 metric ton = 2,204.6 pounds of CO₂e. 1,000 pounds = 0.45 metric tons of CO₂e

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

There are no known off-site sources of emissions that may affect this proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

During construction, impacts to air quality would be reduced and controlled through implementation of standard federal, state, and local emission control criteria and City of Seattle construction practices. These would include requiring contractors to use best available control technologies, proper vehicle maintenance, and minimizing vehicle and equipment idling.

3. Water

a. Surface:

(1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, a)? If so, describe type and provide names. If appropriate, state what stream or river it flows into.

Contract 1 Site 2 is within the 200-foot Shoreline Management district of Lake Washington, as mapped by SDCI. A wetland is mapped along the shoreline. During a site visit in March 2018, the wetland was observed to be more than 200 feet from this work site.

Contract 1 Site 13 is adjacent to wetlands and is within a wetland buffer. It is also in the Riparian Management Area of Durham Creek, as mapped by SDCI. A site visit conducted in March 2018 confirmed the subject pipes convey this watercourse beneath Myers Way S. Immediately upstream and west of the subject pipes, the watercourse is routed through a stormwater detention pond on the City of Seattle's Joint Training Facility property. The pond also collects wetland drainage runoff from areas to the southeast. Upstream and south of the detention pond, water flows in an historic stream channel through a wetland before discharging to the pond. The watercourse in this area is seasonal with a channel less than two feet wide. This is the farthest upstream extent of Durham Creek as mapped by the SDCI and Tabor et

al. (2010, Distribution and Habitat Use of Fish in Seattle's Streams). Tabor et al. mapped this as a Type F watercourse based on geomorphic characteristics, although they did not detect any fish here.

Some discharge from the detention pond is directed into a compensatory wetland mitigation area in a large ditch feature on the west side of Myers Way S, adjacent to the work site. Most of the flow, however, is directed into the subject pipe, which conveys the flow beneath Myers Way S. The pipe discharges into a ravine on the east side of the roadway. The upper portion of the ravine has approximately 30 percent slopes. Farther downstream, the channel area appears to be of sufficient width (greater than two feet) and gradient (less than 16%) to provide potential fish habitat. However, at State Route 509 the stream enters a steep, approximately 1,000-foot-long culvert. The watercourse then daylights for a short distance along the west side of Marra-Desimone Park, where it again meets Type F criteria. Near the northwest corner of the Park, the watercourse enters the City's municipal stormwater system and eventually discharges to the Duwamish River near 7th Ave S, more than one mile to the north.

Contract 3 Site 6 is adjacent to a wetland and Tributary H to Piper's Creek, which passes under NW Carkeek Park Road in a separate culvert. A site visit on March 23, 2018 confirmed the presence of a riverine wetland adjacent to the stream channel west of NW Carkeek Park Road. The work site is in the Riparian Management Area and wetland buffer of that watercourse and wetland system.

Contract 3 Site 8 is not located near any watercourse, wetland, or associated buffer.

The 5th Ave S work site is approximately 3,000 feet south of the Duwamish Waterway and is in the buffer of a wetland at 8830 4th Ave S.

(2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If so, please describe, and attach available plans.

Work will occur in the buffer of the wetland located at 8830 4th Ave S and in the Riparian Management Areas and buffers of wetlands associated with Durham Creek and Piper's Creek. However, all proposed work would disturb only existing paved surfaces within those buffers and Riparian Management Areas.

(3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands, and indicate the area of the site that would be affected. Indicate the source of fill material.

No fill or dredge material would be placed in or removed from surface water or wetlands.

(4) Will the proposal require surface water withdrawals or diversions? If so, give general description, purpose, and approximate quantities if known.

The proposed work would not require surface water withdrawals. Durham Creek will be temporarily bypassed around the work site at Contract 1 Site 13. The diverted watercourse would be discharged to the same ravine into which it currently discharges, but through an existing outfall at a different location. No other sites would require surface water diversions.

(5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No portion of the project lies within a 100-year floodplain.

(6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The proposed work would not produce or discharge waste materials to surface waters. However, several construction activities such as pouring and handling concrete, etc., would generate pollutants that could potentially enter local drainage conveyance systems. Non-sediment pollutants that may be present during construction include:

- Petroleum products including fuel, lubricants, hydraulic fluids, and form oils
- Paints, glues, solvents, and adhesives
- Concrete and concrete washwater
- Chemicals associated with portable toilets.

Procedures to prevent and control pollutants, including hazardous materials such as hydrocarbons and pH-modifying substances, would be described in the Spill Prevention, Control, and Countermeasures Plan to be prepared as part of the project's Storm Water Pollution Prevention Plan.

b. Ground:

(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.

No groundwater withdrawals are planned. Dewatering during construction is anticipated at the 5th Ave S work site and would be managed according to the Spill Prevention, Control, and Countermeasures Plan. Previous geotechnical investigation noted depth to groundwater in this area ranged from 4 to 8 feet below ground surface. Construction is anticipated to require dewatering of excavations using standard collection and pumping methods and/or a series of well points. Quantities of water potentially collected by dewatering are unknown and may require a King County wastewater discharge permit if that collected water is discharged into King County's wastewater management system.

- (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.**

No waste material would be discharged to groundwater for this project.

c. Water Runoff (including storm water):

- (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 runoff will be managed during construction to prevent sediment from leaving the construction site. Barriers such as silt fencing or sand bags would be used to prevent runoff from entering or leaving the work sites. Once construction is complete, temporary erosion control measures would be removed.

The completed projects would not create a need to manage additional stormwater runoff beyond current conditions. Stormwater would follow pre-construction pathways. The current volume, timing, and duration of these stormwater flows are not known.

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

There would be no waste materials from this project that could enter ground or surface waters.

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

The completed work would restore disturbed areas to near-original condition and would not create a need to manage additional stormwater runoff beyond currently existing conditions. Stormwater would follow pre-construction pathways. The current volume, timing, and duration of these stormwater flows are not known.

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

No adverse impacts to surface, ground, or runoff water are anticipated. BMPs identified in the City of Seattle's Stormwater Code (Seattle Municipal Code Title 22, Subtitle VIII), the City of Seattle Director's Rule SDCI 17-2017/SPU DWW-200, and Volume 2 Construction Stormwater Control Manual, would be used as needed to control erosion and sediment transport from and to the work sites during construction.

Damaged and demolished paved surfaces would be restored and all disturbed soil would be stabilized using hydroseeding and other erosion control methods, as appropriate.

4. Plants

a. Types of vegetation found on the site:

<input checked="" type="checkbox"/> Deciduous trees:	<input checked="" type="checkbox"/> Alder	<input checked="" type="checkbox"/> Maple	<input type="checkbox"/> Aspen	<input type="checkbox"/> Other:
<input checked="" type="checkbox"/> Evergreen trees:	<input checked="" type="checkbox"/> Fir	<input checked="" type="checkbox"/> Cedar	<input type="checkbox"/> Pine	<input type="checkbox"/> Other:
<input checked="" type="checkbox"/> Shrubs				
<input checked="" type="checkbox"/> Grass				
<input type="checkbox"/> Pasture	<input type="checkbox"/> Crop or grain			
<input type="checkbox"/> Orchards, vineyards, or other permanent crops				
<input checked="" type="checkbox"/> Wet soil plants:	<input type="checkbox"/> Cattail	<input checked="" type="checkbox"/> Buttercup	<input type="checkbox"/> Bulrush	<input type="checkbox"/> Skunk cabbage
<input type="checkbox"/> Other:				
<input type="checkbox"/> Water plants:	<input type="checkbox"/> water lily	<input type="checkbox"/> eelgrass	<input type="checkbox"/> milfoil	<input type="checkbox"/> Other:
<input type="checkbox"/> Other types of vegetation:				

b. What kind and amount of vegetation will be removed or altered?

The work sites are in improved street rights-of-way that include pavement, gravel shoulders, gravel access paths, and/or landscaped areas or weedy vegetation. There may be limited need to trim or remove vegetation on adjacent privately-owned parcels. If construction, staging, or access activities damage vegetation, including shrubs, hedges, lawn, trees, etc., such vegetation will be restored to pre-project conditions following project completion.

c. List threatened or endangered species known to be on or near the site.

No federally-listed endangered or threatened plant species or State-listed sensitive plant species are known to occur within Seattle’s municipal limits. Work sites have been intensively disturbed by development and redevelopment over the last 100 years and have been extensively excavated, filled, paved, or occupied by street, utility, residential, and other constructed features. There is no habitat for threatened or endangered plants.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

The work sites are in improved street rights-of-way that include pavement, gravel shoulders, gravel access paths, and/or landscaped areas or weedy vegetation. There may be limited need to trim or remove vegetation on adjacent privately-owned parcels. If construction, staging, or access activities damage vegetation, including shrubs, hedges, lawn, trees, etc., such vegetation will be restored to pre-project conditions following t completion of construction.

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

Himalayan blackberry (*Rubus armeniacus*) and knotweed (*Polygonum cuspidatum*) are present near the work site at Contract 3 Site 6. Herb Robert (*Geranium robertianum*) is present in the immediate vicinity of the work site at Contract 1 Site 2, and Himalayan blackberry is present on the lake shoreline.

5. Animals

a. List any birds and other animals that have been observed on or near the site or are known to be on or near the site: *[check the applicable boxes]*

Birds: Hawk Heron Eagle Songbirds
 Other: The project area as a whole generally supports a wide variety of resident and migratory waterfowl, song birds, and raptors. In addition to the checked boxes above, some commonly observed species include geese, ducks, crows, pigeons, and gulls.

Mammals: Deer Bear Elk Beaver
 Other: The project area encompasses the presence and habitats for a variety of animal species commonly found in urban areas of the region. Commonly observed species include opossum, rabbit, raccoon, skunk, squirrel, rat, mice, and bat.

Fish: Bass Salmon Trout Herring
 Shellfish Other:
 Contract 1 Site2: Salmon, steelhead trout, cutthroat and rainbow trout, and bass are present in Lake Washington.

Contract 3 Site 6: Tributary H to Thornton Creek is classified as Type F downstream of the adjacent culvert, and a Type Np upstream from that culvert (Tabor et al. 2010, *Distribution and Habitat Use of Fish in Seattle's Streams*). Cutthroat trout are present.

b. List any threatened or endangered species known to be on or near the site:

Based on a check of the WDFW's "Priority Habitat Species on the Web" database on March 14, 2018, Contract 1 Site 2 is adjacent to Lake Washington, which supports threatened Chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*). Contract 1 Site 13 is mapped as being within a quarter-township of a known occurrence of western pond turtle (*Actinemys marmorata*), a State-listed endangered species. Extant populations of western pond turtle are known from only a handful of locations in Washington, none of which are in or close to the City of Seattle. No Priority Habitat Species or threatened or endangered species are known to be on or near Contract 3 Site 6 or the 5th Ave S Sewer Replacement site.

c. Is the site part of a migration route? If so, explain.

Seattle is in the migratory route of many birds and other animal species and is part of the Pacific Flyway, a major north-south route of travel for migratory birds in the Americas extending from Alaska to Patagonia, South America. Also, Puget Sound and Lake Washington are important water migration routes for many animal species. In addition, Contract 3 Site 6 is in an area identified as a Biodiversity Area and Corridor by WDFW.

d. Proposed measures to preserve or enhance wildlife, if any:

The proposed work would limit plant removal, pruning, and other vegetation modification and disturbance to that required for project construction. Construction would not remove any trees, but may temporarily damage lawn, hedges, or other

landscaped areas. All damaged or removed vegetation would be restored to pre-project conditions or otherwise replaced once the work is complete.

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

King County lists the European starling, house sparrow, Eastern gray squirrel, and fox squirrel as terrestrial invasive species for this area (<http://www.kingcounty.gov/services/environment/animals-and-plants/biodiversity/threats/Invasives.aspx>).

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.

No energy would be required to meet the constructed works' energy needs, beyond the energy already utilized for existing sewer and stormwater drainage systems.

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

The proposed work does not involve building structures or planting vegetation that would block access to the sun for 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:

There are no conservation features or proposed measures to reduce or control energy impacts because there would be no such impacts.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe:

Small amounts of materials likely to be present during construction, mainly to support vehicle and construction equipment, include gasoline and diesel fuels, hydraulic fluids, oils, lubricants, but also may include solvents, paints, and other chemical products. A spill of one of these chemicals could potentially occur during construction due to equipment failure or worker error. Though unlikely, contaminated soils, sediments, or groundwater could also be exposed during excavation. If disturbed, contaminated substances could expose construction workers and potentially other individuals in the vicinity through blowing dust, stormwater runoff, or vapors.

A cured-in-place pipe (CIPP) installation process would be used at Contract 3 Site 8. This process uses a liquid thermosetting plastic resin that is hardened inside the existing deteriorated pipe to create a new pipe-within-a-pipe. The uncured resin contains styrene, which assists in polymerizing the resin when cured. Styrene is widely used in the plastics and composites industries and has a distinctive odor that humans detect at very

low levels (at concentrations of approximately 0.017-1.9 parts per million [ppm]). During construction, workers and the public (passersby and nearby residents) may smell these styrene fumes. In rare cases, styrene fumes may enter building ventilation systems. However, odor is not an indicator for the level of risk from inhalation of styrene.

The proposed CIPP work would use ultraviolet light to cure the resin, which results in lower styrene emissions than steam or hot water curing methods. SPU anticipates total maximum exposures resulting from this process would be on the order of a few ppm at each site, at most, during a period of several hours. This exposure is well below the Occupational Safety and Health Administration's (OSHA) established regulatory styrene exposure limit (Permissible Exposure Limit [PEL]) of 100 ppm for healthy adult workers in the work place (8 hours per day, 5 days per week). OSHA's air regulatory exposure limit for styrene is not protective of infants, children, or immuno-compromised individuals who would be more susceptible to chemical toxicity. Based on risk assessments by the United States and the Netherlands, the International Toxicity Estimates for Risk (ITER) values for styrene for these susceptible populations range from 20 to 25 ppm.

(1) Describe any known or possible contamination at the site from present or past uses.

None of the work sites are known to have environmental contamination. However, it is possible that contamination of soil or groundwater associated with past uses or activities on or near a site may be present.

(2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There are no known hazardous chemicals or conditions that might affect development and design of the proposed work.

(3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Chemicals and pollutants that may be present during construction include:

- Petroleum products associated with vehicular and equipment use, including fuel, lubricants, hydraulic fluids, and form-release oils
- Paints, glues, solvents, and adhesives
- Chemicals associated with portable toilets.

No toxic or hazardous chemicals would be stored, used, or produced at any time during the operating life of the constructed project.

(4) Describe special emergency services that might be required.

No special emergency services such as confined space rescue would be required during construction or operation of the project. Possible fire or medic services could be required during construction, as well as possibly during operation of the

completed project. However, the completed work would not demand higher levels of special emergency services than already exist at the work sites.

(5) Proposed measures to reduce or control environmental health hazards, if any:

The construction contractor would be required to develop and implement a Spill Plan to control and manage spills during construction. In addition, a spill response kit will be maintained at each site during construction work at that site, and all workers will be trained in spill prevention and containment consistent with the City of Seattle's Standard Specifications for Road, Bridge, and Municipal Construction. During construction, the contractor would use standard operating procedures and best management practices (BMPs) identified in the City of Seattle's Stormwater Code (Seattle Municipal Code Title 22, Subtitle VIII), the City of Seattle Director's Rule SDCI 17-2017/SPU DWW-200, and Volume 2 Construction Stormwater Control Manual to reduce or control any possible environmental health hazards. Soils contaminated by spills during construction would be excavated and disposed of in a manner consistent with the level and type of contamination, in accordance with federal, state and local regulations, by qualified contractor(s) and/or City staff.

Additionally, workers will be required to follow the Washington State safety standards for entry and work in confined spaces (Chapter 296-809 of the Washington Administrative Code [WAC]), which includes requirements for atmospheric testing in a confined space structure prior to entry and work within the structure. Following the completion of construction, SPU workers performing routine operation and maintenance activities requiring entry to maintenance hole structures would follow the requirements of SPU's Confined Space Safety Program which implements the requirements of WAC 296-809.

b. Noise

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

Noise that exists in the area would not affect the project.

(2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Noise levels in the vicinity of construction would temporarily increase during construction. Short-term noise from construction equipment would be limited to the allowable maximum levels of applicable laws, including the City of Seattle's Noise Control Ordinance (SMC 25.08.425—Construction and Equipment Operations). Within the allowable maximum levels, SMC 25.08 permits noise from construction equipment between the hours of 7 a.m. and 7 p.m. weekdays, and 9 a.m. and 7 p.m. weekends and legal holidays. The completed project would generate no additional noise from equipment used for operation or maintenance.

(3) Proposed measures to reduce or control noise impacts, if any:

Construction equipment would be muffled in accordance with the applicable laws. SMC Chapter 25.08, which prescribes limits to noise and construction activities, would be enforced while the proposed work is being constructed and during operations, except for emergencies.

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.

Work sites are in street rights-of-way.

Adjacent uses include:

- Contract 1 Site 2: Residential
- Contract 1 Site 13: Commercial
- Contract 3 Site 6: Residential
- Contract 3 Site 8: Commercial and residential
- 5th Ave S Sewer Replacement: Residential and Industrial

The proposed work could result in short-term, temporary closures of street lanes, parking areas, and sidewalks, and/or route detours that would be experienced by individuals who live, work, or visit destinations near the work sites. For Contract 1 Site2 and 5th Ave S Sewer Replacement, repair work would temporarily block access to residential driveways, and coordination with the residents would be required.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

The work sites have not been recently used for agricultural purposes or forestry. The proposed work would not result in land use conversion of any kind.

(1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how?

The proposed work would neither be affected by nor affect surrounding working farm or forest land normal business operations because there are no such operations at or near any of the work sites.

c. Describe any structures on the site.

The work sites are locations of existing, buried sewer and stormwater infrastructure and other utilities located within improved street rights-of-way. Sewer maintenance holes are the only above-ground structures within the work sites. Other structures on and in the vicinity of work sites include residential and commercial structures and fences.

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

The proposed work is related to buried and at-grade utilities and would not demolish any aboveground structures.

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

Site	Zoning Classification
Contract 1 Site 2	Residential, Single-family 7200
Contract 1 Site 13	Commercial 2
Contract 3 Site 6	Residential, Single-family 9600
Contract 3 Site 8	Neighborhood Commercial 2
5 th Ave S	Residential, Single-family 5000; Industrial Buffer Unlimited/45

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

Site	Comprehensive Plan Designation
Contract 1 Site 2	City-owned Open Space
Contract 1 Site 13	Commercial / Mixed Use Areas
Contract 3 Site 6	Single Family Residential Areas
Contract 3 Site 8	Residential Urban Village
5th Ave S	Residential Urban Village

g. If applicable, what is the current shoreline master program designation of the site?

Contract 1 Site 2 is in the Conservancy Recreation environment.

h. Has any part of the site been classified as an “environmentally critical” area? If so, specify.

The following environmentally critical areas (ECAs) are mapped by SDCI as occurring in or near work sites:

Site	ECA
Contract 1 Site 2	adjacent to a wetland on Lake Washington shoreline.
Contract 1 Site 13	within the Riparian Management Area for Durham Creek and within the buffer of a compensatory wetland (D. Coulbert, City of Seattle Joint Training Facility, personal communication, March 26, 2018). On the east side of Myers Way S, the work site partially extends into a ravine with Steep Slopes.
Contract 3 Site 6	adjacent to steep slopes, a wetland, and a watercourse; and within a Riparian Management Area, wetland buffer, and Fish and Wildlife Habitat Conservation area.
Contract 3 Site 8	within a mapped liquefaction-prone area.
5th Ave S	within a mapped liquefaction-prone area. The site is within a 1000-foot Methane Buffer due to South Park Transfer Station and the historic landfill located there.

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

No people would reside or work in the completed project.

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

The proposed work would not displace any people.

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

No such measures are proposed because the proposed work would not displace any people.

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

The project would obtain all necessary approvals.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

No such measures are proposed because there would be no impacts to agricultural or forest lands of long-term significance. There are no nearby agricultural or forest lands of long-term commercial significance.

9. Housing

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

The proposed work would not provide any housing units.

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

The proposed work would not eliminate any housing units.

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

No such measures are proposed because there would be no housing impacts.

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 proposed structures would be grade level.

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

No views would be altered or obstructed.

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

Damaged and demolished paved surfaces would be restored, and all disturbed soil would be stabilized using hydroseeding and other erosion control methods, as appropriate.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The constructed projects would not produce light or glare. During construction, if an emergency situation calls for after-dark work, the construction contractor may deploy portable lights that temporarily produce light and glare.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

The completed projects would not create light or glare.

c. What existing off-site sources of light or glare may affect your proposal?

There are no existing off-site sources of light and glare that would affect the proposed work.

d. Proposed measures to reduce or control light and glare impacts, if any:

If an emergency requires after-dark work during construction, portable lighting would be adjusted as feasible to minimize glare.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The proposed work is in street rights-of-way, which may be used for informal recreational activities such as dog-walking, walking, jogging, and bicycling. Additionally, Contract 1 Site 2 is adjacent to City recreational open space along Lake Washington Boulevard. Contract 3 Site 6 is adjacent to Carkeek Park.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The proposed work would not permanently displace any existing recreational uses. Access to the streets and parking areas affected by construction would be more challenging during construction, but SPU would require the construction contractor to maintain safe pedestrian and vehicle access at all times. Exposed work areas would be off-limits for the duration of project construction (two to four working days).

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Temporary closures or detours affecting vehicle and/or pedestrian routes/access may be required during construction, but those are expected to be brief.

13. Historic and Cultural Preservation

- a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.**

Contract 1 Site 2 is in the Lake Washington Boulevard Historic District, which encompasses Lake Washington Boulevard connecting Montlake Boulevard to Seward Park through the Washington Park Arboretum and land generally adjacent to Lake Washington. The District was designated March 16, 2017 and is considered significant at the local level. There are also residential buildings older than 45 years near Contract 1 Site 2 that have not been evaluated for cultural/historic significance. However, no buildings or structures would be disturbed by the proposed work. No other places or objects listed on, or proposed for, national, state, or local preservation registers are known to be on or adjacent to the work sites.

- b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.**

According to the information sources listed in Item B13c below, there are no archaeological or cultural resources that have been documented to exist on or near the work sites. All ground disturbance and excavation would occur in existing transportation/utility rights-of-way areas that have been disturbed previously by installation of underground utility infrastructure.

According to the Washington Department of Archeology and Historic Preservation's (DAHP) Washington Information System for Architectural and Archaeological Research Data (WISAARD) predictive model, Contract 1 Site 2 is at Very High Risk for archaeological resources, and the Contract 1 Site 13, Contract 3 Site 6, Contract 3 Site 8, and 5th Ave S work sites are at High Risk for archaeological resources.

- c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the Department of Archaeology and Historic Preservation, archaeological surveys, historic maps, GIS data, etc.**

To determine if National Register or Washington Heritage properties are in or adjacent to the proposed work, the four spot repair work sites were checked against the following registers on March 15, 2018:

- WISAARD (found at <https://fortress.wa.gov/dahp/wisaardp3/>)
- Landmark List, and Map of Designated Landmarks, maintained by the City of Seattle, Department of Neighborhoods (found at <http://www.seattle.gov/neighborhoods/programs-and-services/historicpreservation/landmarks>)

For the 5th Ave S work site, Historical Research Associates, Inc. (HRA, November 2014) conducted a review of WISAARD, as well as ethnographic literature on file at HRA and historic maps. HRA researched cultural resource survey reports, archaeological site records, cemetery records, and National Register of Historic Places (NRHP) and Washington Heritage Register (WHR) eligible and listed resources.

DAHP's statewide predictive model layer was also reviewed for probability estimates of prehistoric cultural resources, and to aid in developing the field strategy. Background research for archaeological sites and cultural resources studies was conducted using an approximate ½-mile (mi) search radius from the Area of Impact (AI). HRA's in-house library was used to obtain information on the environmental, archaeological, and historical context of the AI.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

All of the proposed work is in street rights-of-way, would not affect any buildings or structures, and is in areas that have been previously disturbed and filled to construct/install the existing sewer system piping, streets and sidewalks, and other developments. The proposed work's location on previously disturbed and filled ground substantially reduces the chance of encountering contextually significant archaeological materials.

The 5th Ave S work site would be monitored by a professional archaeologist during excavation because this site may over-excavate into previously undisturbed native soils or soil sediments to accommodate bedding aggregate. Monitoring would be conducted using that site's Monitoring and Inadvertent Discovery Plan prepared by a professional archaeologist.

An approved inadvertent discovery plan will be onsite and in effect during all construction activities. Excavation at the four spot repair work sites is not likely to excavate into previously undisturbed native soil or sediments. Should evidence of cultural artifacts or human remains, either historic or prehistoric, be encountered during excavation at the four spot repair work sites, work in that immediate area would be suspended and the find would be examined and documented by a professional archaeologist. Decisions regarding appropriate mitigation and further action would be made at that time.

14. 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.

Work sites are in existing street rights-of-way. Staging areas would be within 200 feet of repair work, on existing street rights-of-way or utility easements where possible.

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?

Public bus transit service is provided by King County Metro. The availability and level of service near the work sites varies by site. Contract 3 Site 8 is within one block of a Metro route. Contract 1 Site 2, Contract 1 Site 13, and Contract 3 Site 6 are not located directly on Metro routes, but are located within one mile of a bus stop. The completed proposed work would not require nor affect public transit.

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

The completed work would neither create nor eliminate any parking spaces. However, during construction, there may be temporary on-street parking closures during construction activities. The specific timing and duration of parking closures are not known at this time, but such closures would comply with policies administered by SDOT as part of its street use permitting process.

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 proposed work would restore any demolished and damaged street panels, curbs, traffic aprons, and other transportation infrastructure to pre-construction conditions or better and consistent with SDOT requirements. The completed work would not require any new or improved public or private transportation infrastructure.

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

The proposed work would not use or occur in the immediate vicinity 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 nonpassenger vehicles). What data or transportation models were used to make these estimates?

Construction of the proposed work would generate an estimated 55 vehicular round trips for each of the four spot repair sites. Construction at the 5th Ave S work site would generate an estimated 847 vehicular round trips.

The proposed work would affect existing sewer and storm drain pipes. These sites currently require infrequent, periodic trips to transport SPU crews, contractors, and equipment to perform visual inspections, maintenance, and repairs when needed. No long-term additional traffic would result from the completed work.

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 proposed work would not interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area.

h. Proposed measures to reduce or control transportation impacts, if any:

The following measures would be used to reduce or control transportation impacts:

- SPU would require the construction contractor to submit a traffic control plan for approval and enforcement by SPU and SDOT.
- SPU would conduct public outreach before and during construction to notify residents, local agencies, Metro, and other stakeholders of work progress and expected disruptions or changes in traffic flow.
- Access for emergency-response vehicles would be maintained at all times.
- Through-access and vehicle access to private properties may not be available at all times during construction, but temporary closures would be minimized and detour routes would be properly and clearly signed.
- Alternative routes for pedestrians, bicyclists, and those with disabilities would be identified and clearly signed, as needed.

15. 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 proposed work is not expected to create an increased need for public services. SPU and SDOT would require the construction contractor to accommodate emergency access for buildings accessed via the affected streets. Emergency access would comply with policies administered by SDOT as part of its Street Use permitting process.

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

During construction, the proposed work would be required at all times to accommodate emergency access. Otherwise, no mitigation is being proposed because the completed work would have no adverse impacts on public services.

16. Utilities

a. Check utilities available at the site, if any:

- | | | | |
|--|--|---|--|
| <input checked="" type="checkbox"/> Electricity | <input checked="" type="checkbox"/> Natural gas | <input checked="" type="checkbox"/> Water | <input checked="" type="checkbox"/> Refuse service |
| <input checked="" type="checkbox"/> Telephone | <input checked="" type="checkbox"/> Sanitary sewer | <input type="checkbox"/> Septic system | |
| <input checked="" type="checkbox"/> Other: cable, fiber optics | | | |

- 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.

The proposed work may interrupt sewer service for brief periods to install and then disconnect a bypass around the affected pipe. SPU would notify affected residents and businesses by issuing Service Disruption Notices (in the form of door hangers) at least 48 hours before those outages occur. No new utilities are being proposed. No interruptions of other utilities or services are anticipated during construction.

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: _____


Jerry Waldron, Project Manager

Date: _____

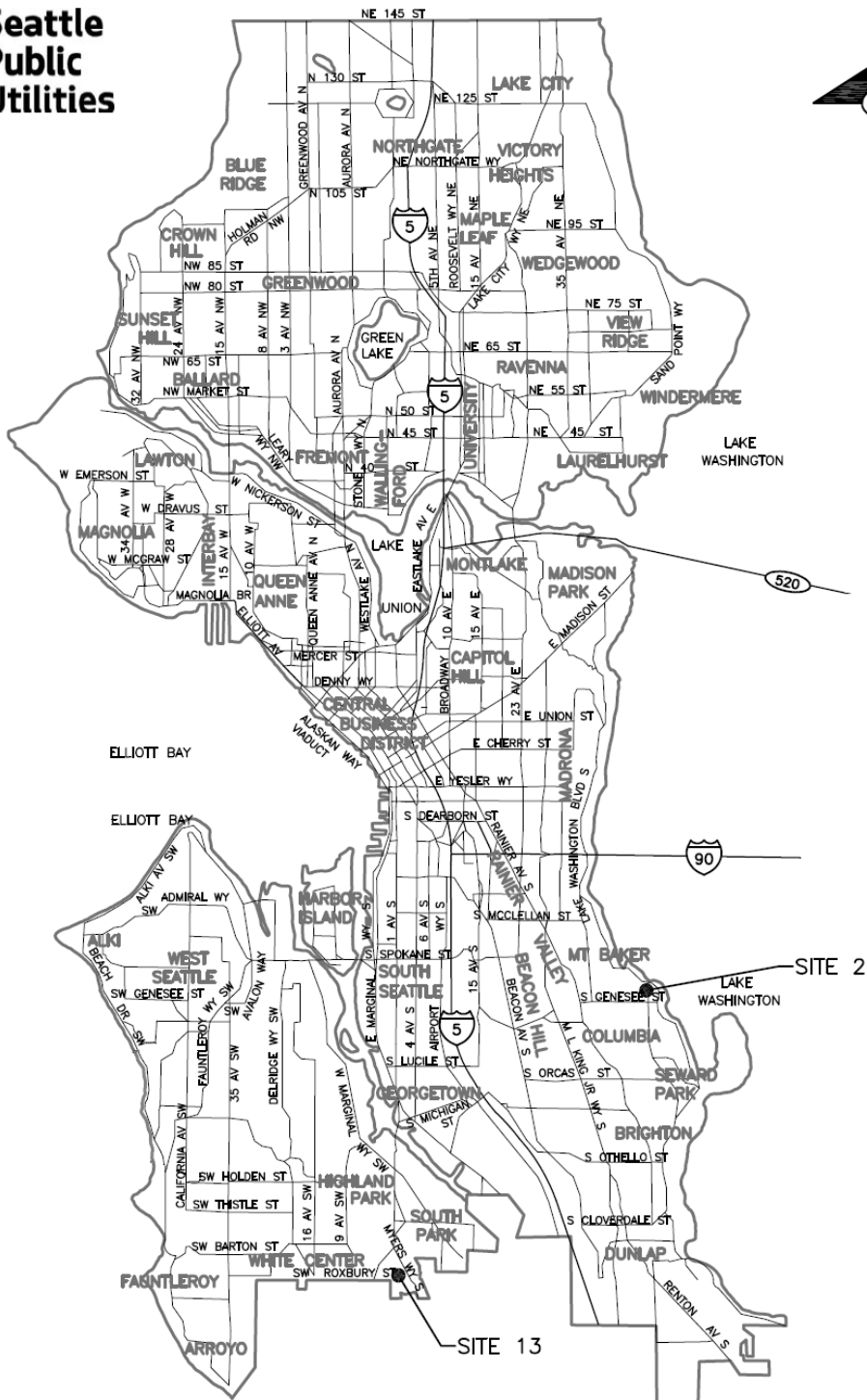
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- Attachment A – Vicinity Map, Contract 1
- Attachment B – Vicinity Map, Contract 3
- Attachment C – Vicinity Map, 5th Ave S Sewer Replacement
- Attachment D – Greenhouse Gas Emissions Worksheet

Attachment A – 2017 Spot Sewer Rehabilitation Contract 1 Vicinity Map

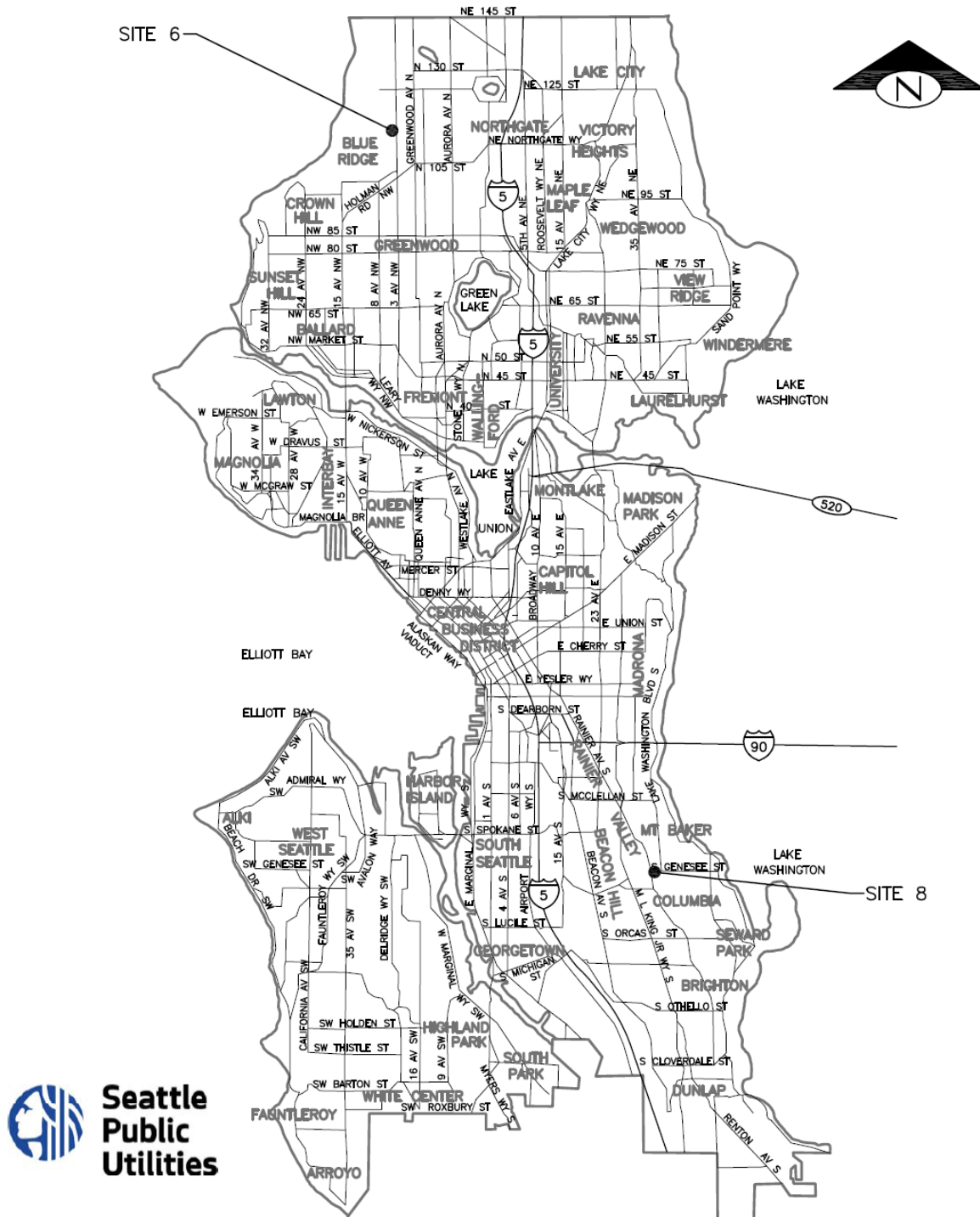


Seattle
Public
Utilities



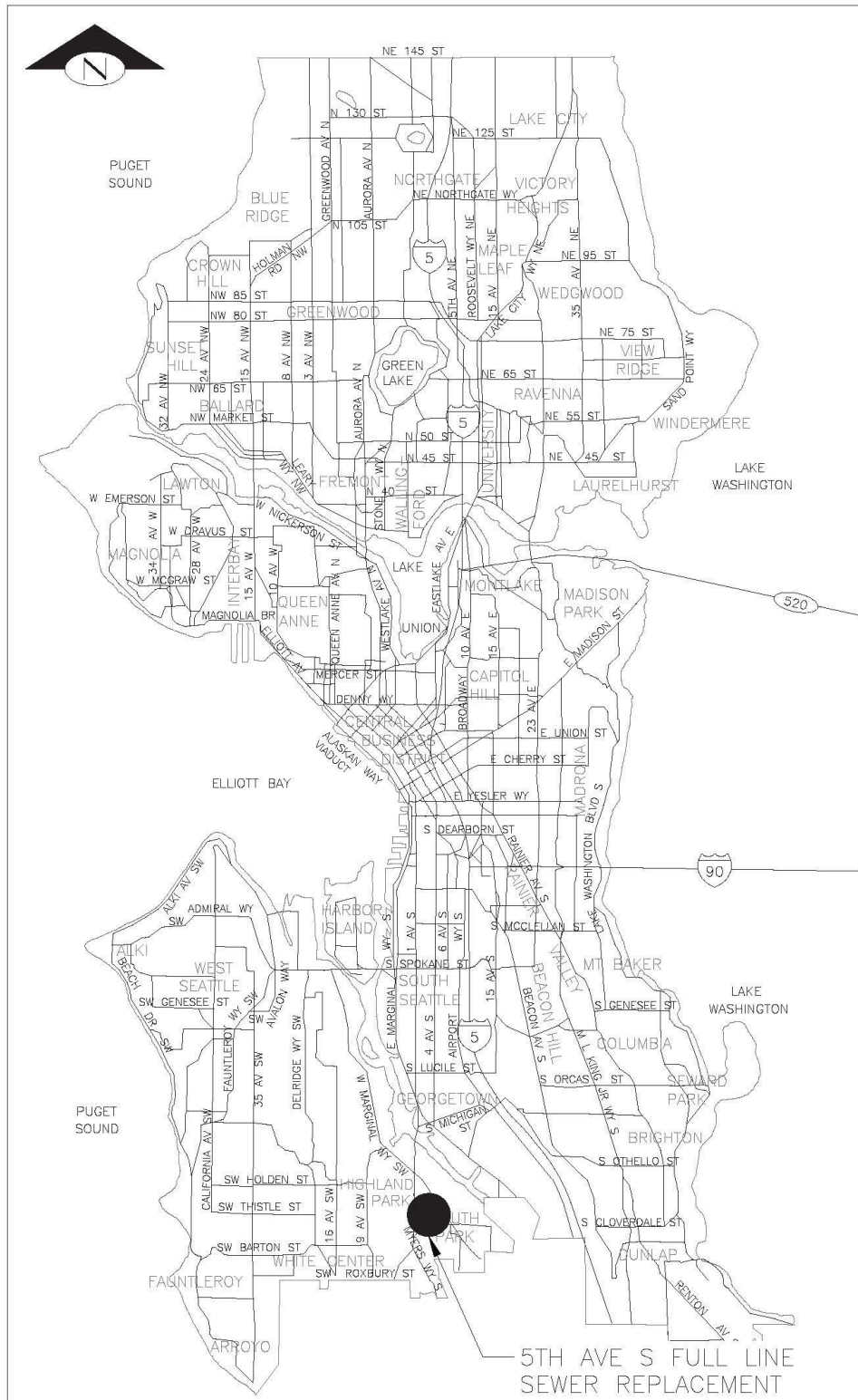
2017 SEWER REHAB CONTRACT 1
VICINITY MAP

Attachment B – 2017 Spot Sewer Rehabilitation Contract 3 Vicinity Map



2017 SEWER REHAB CONTRACT 3
VICINITY MAP

Attachment C – 5th Ave S Sewer S Replacement Vicinity Map



**2017 Spot Sewer Rehabilitation and 5th Ave S Sewer Replacement Projects
SEPA Environmental Checklist**

Attachment D – Greenhouse Gas Emissions Worksheet Spot Sewer Rehab

Section I: Buildings						
			Emissions Per Unit or Per Thousand Square Feet (MTCO ₂ e)			
Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Embodied	Energy	Transportation	Lifespan Emissions (MTCO ₂ e)
Single-Family Home	0		98	672	792	0
Multi-Family Unit in Large Building	0		33	357	766	0
Multi-Family Unit in Small Building	0		54	681	766	0
Mobile Home	0		41	475	709	0
Education		0.0	39	646	361	0
Food Sales		0.0	39	1,541	282	0
Food Service		0.0	39	1,994	561	0
Health Care Inpatient		0.0	39	1,938	582	0
Health Care Outpatient		0.0	39	737	571	0
Lodging		0.0	39	777	117	0
Retail (Other than Mall)		0.0	39	577	247	0
Office		0.0	39	723	588	0
Public Assembly		0.0	39	733	150	0
Public Order and Safety		0.0	39	899	374	0
Religious Worship		0.0	39	339	129	0
Service		0.0	39	599	266	0
Warehouse and Storage		0.0	39	352	181	0
Other		0.0	39	1,278	257	0
Vacant		0.0	39	162	47	0
TOTAL Section I Buildings						0

Section II: Pavement					
					MTCO ₂ e
Pavement (sidewalk, asphalt patch)		0.0			0
Concrete Pad (50 MTCO ₂ e/1,000 sq ft of pavement at a depth of 6 inches)		400 sq ft (6 inches thick)			20
TOTAL Section II Pavement					20

Section III: Construction	
(See detailed calculations below)	MTCO₂e
TOTAL Section III Construction	15.15

Section IV: Operations and Maintenance	
(See detailed calculations below)	MTCO₂e
TOTAL Section IV Operations and Maintenance	0

TOTAL GREENHOUSE GAS (GHG) EMISSIONS FOR PROPOSED WORK (MTCO₂e)	35.15
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**2017 Spot Sewer Rehabilitation and 5th Ave S Sewer Replacement Projects
SEPA Environmental Checklist**

Attachment D – Greenhouse Gas Emissions Worksheet Spot Sewer Rehab, continued

Section III Construction Details		
Construction: Diesel		
Equipment	Diesel (gallons)	Assumptions
Excavator	704	4 days/site x 8 hours/day x 4 sites x 5.5 gallons/hour (270 hp engine)
Dump truck	192	2 round trips/day x 4 workdays/site x 4 sites x 30 roundtrip miles ÷ 5 mpg
Concrete truck	48	2 round trips/site x 4 sites x 30 roundtrip miles ÷ 5 mpg
Support box truck with hydraulic lift	80	4 round trips/site x 4 sites x 30 miles/round trip ÷ 6mpg
Subtotal Diesel Gallons	1,024	
GHG Emissions in lbs CO₂e	27,187	26.55 lbs CO ₂ e per gallon of diesel
GHG Emissions in metric tons CO₂e	12.33	1,000 lbs = 0.45359237 metric tons

Construction: Gasoline		
Equipment	Gasoline (gallons)	Assumptions
Pick-up Trucks or Crew Vans	160	4 days/site x 4 sites x 5 trucks x 2 round-trip/day x 20 miles/round trip ÷ 20 mpg
Misc. Hand Equipment	96	2 Pcs. of equipment x 10 hours/day x 4 days/site x 4 sites x 0.3 gal/hour
Subtotal Gasoline Gallons	256	
GHG Emissions in lbs CO₂e	6220.8	24.3 lbs CO ₂ e per gallon of gasoline
GHG Emissions in metric tons CO₂e	2.82	1,000 lbs = 0.45359237 metric tons

Construction Summary		
Activity	CO₂e in pounds	CO₂e in metric tons
Diesel	27,187	12.33
Gasoline	6220.8	2.82
Total for Construction	33,407.8	15.15

Section IV Long-Term Operations and Maintenance Details		
Operations and Maintenance: Diesel		
Equipment	Diesel (gallons)	Assumptions
Subtotal Diesel Gallons		
GHG Emissions in lbs CO₂e		26.55 lbs CO ₂ e per gallon of diesel
GHG Emissions in metric tons CO₂e		1,000 lbs = 0.45359237 metric tons

Operations and Maintenance: Gasoline		
Equipment	Gasoline (gallons)	Assumptions
Subtotal Gasoline Gallons		
GHG Emissions in lbs CO₂e		24.3 lbs CO ₂ e per gallon of gasoline
GHG Emissions in metric tons CO₂e		1,000 lbs = 0.45359237 metric tons

Operations and Maintenance Summary		
Activity	CO₂e in pounds	CO₂e in metric tons
Diesel		
Gasoline		
Total Operations and Maintenance		

**2017 Spot Sewer Rehabilitation and 5th Ave S Sewer Replacement Projects
SEPA Environmental Checklist**

Attachment D – Greenhouse Gas Emissions Worksheet 5th Ave S Sewer Replacement

Section I: Buildings						
			Emissions Per Unit or Per Thousand Square Feet (MTCO ₂ e)			
Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Embodied	Energy	Transportation	Lifespan Emissions (MTCO ₂ e)
Single-Family Home	0		98	672	792	0
Multi-Family Unit in Large Building	0		33	357	766	0
Multi-Family Unit in Small Building	0		54	681	766	0
Mobile Home	0		41	475	709	0
Education		0.0	39	646	361	0
Food Sales		0.0	39	1,541	282	0
Food Service		0.0	39	1,994	561	0
Health Care Inpatient		0.0	39	1,938	582	0
Health Care Outpatient		0.0	39	737	571	0
Lodging		0.0	39	777	117	0
Retail (Other than Mall)		0.0	39	577	247	0
Office		0.0	39	723	588	0
Public Assembly		0.0	39	733	150	0
Public Order and Safety		0.0	39	899	374	0
Religious Worship		0.0	39	339	129	0
Service		0.0	39	599	266	0
Warehouse and Storage		0.0	39	352	181	0
Other		0.0	39	1,278	257	0
Vacant		0.0	39	162	47	0
TOTAL Section I Buildings						0

Section II: Pavement					
					MTCO ₂ e
Concrete Pad (50 MTCO ₂ e/1,000 sq ft of pavement at a depth of 6 inches)		7,900 sq ft (6 inches thick)			395
TOTAL Section II Pavement					395

Section III: Construction	
(See detailed calculations below)	MTCO ₂ e
TOTAL Section III Construction	104.2

Section IV: Operations and Maintenance	
(See detailed calculations below)	MTCO ₂ e
TOTAL Section IV Operations and Maintenance	0

TOTAL GREENHOUSE GAS (GHG) EMISSIONS FOR PROPOSED WORK (MTCO₂e)	499.2
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**2017 Spot Sewer Rehabilitation and 5th Ave S Sewer Replacement Projects
SEPA Environmental Checklist**

Attachment D – Greenhouse Gas Emissions Worksheet 5th Ave S Sewer Replacement, continued

Section III Construction Details		
Construction: Diesel		
Equipment	Diesel (gallons)	Assumptions
Two Excavators	5280	60 days x 8 hours/day x 5.5 gallons/hour X 2 (270 hp engine)
Front End Loader	1,200	60 days x 8 hours/day x 2.5 gallons/hour
Dump truck	480	4 round trips/day x 20 workdays x 30 roundtrip miles ÷ 5 mpg
Concrete truck	96	2 round trips/day x 8 workday x 30 roundtrip miles ÷ 5 mpg
Vibratory / Static Roller	26	4 days x 8 hours/day x 0.8 gallons/hour (185 hp engine)
Asphalt paver	180	40 hours x 4.5 gallons/hour (80 hp engine)
Asphalt truck	80	10 round trips x 40 miles/round trip ÷ 5 mpg
Supply Trucks	120	60 workdays x 2 trucks x 1 round-trip/day x 20 miles/round-trip ÷ 20 mpg
Two flatbed trucks	250	25 round trips x 50 miles/round trip x 2 ÷ 10 mpg
Street Sweeper	160	50 days x 4 hours/day x 0.8 gallons/hour (185 hp engine)
Subtotal Diesel Gallons	7840	
GHG Emissions in lbs CO₂e	208,152	26.55 lbs CO ₂ e per gallon of diesel
GHG Emissions in metric tons CO₂e	94.41	1,000 lbs = 0.45359237 metric tons

Construction: Gasoline		
Equipment	Gasoline (gallons)	Assumptions
Pick-up Trucks or Crew Vans	600	60 workdays x 10 trucks x 1 round-trip/day x 20 miles/round-trip ÷ 20 mpg
Misc. Hand Equipment	288	60 workdays x 8 hours x 2 pcs. of equipment x 0.3 gal/hour
Subtotal Gasoline Gallons	888	
GHG Emissions in lbs CO₂e	21,578	24.3 lbs CO ₂ e per gallon of gasoline
GHG Emissions in metric tons CO₂e	9.79	1,000 lbs = 0.45359237 metric tons

Construction Summary		
Activity	CO₂e in pounds	CO₂e in metric tons
Diesel	208,152	94.4
Gasoline	21,578	9.79
Total for Construction	229,730	104.19

Section IV Long-Term Operations and Maintenance Details		
Operations and Maintenance: Diesel		
Equipment	Diesel (gallons)	Assumptions
Subtotal Diesel Gallons		
GHG Emissions in lbs CO₂e		26.55 lbs CO ₂ e per gallon of diesel
GHG Emissions in metric tons CO₂e		1,000 lbs = 0.45359237 metric tons

Operations and Maintenance: Gasoline		
Equipment	Gasoline (gallons)	Assumptions
Subtotal Gasoline Gallons		
GHG Emissions in lbs CO₂e		24.3 lbs CO ₂ e per gallon of gasoline
GHG Emissions in metric tons CO₂e		1,000 lbs = 0.45359237 metric tons

Operations and Maintenance Summary		
Activity	CO₂e in pounds	CO₂e in metric tons
Diesel/Gasoline		
Total Operations and Maintenance		