

## **Table of Standard Impacts & Mitigation Measures**

The impacts and mitigation measures in the following table address typical impacts that WSDOT may encounter on construction projects. The typical impacts apply to sites of concern identified during the discipline report process. Sites of concern are rated based on relative risk to impact the project (low, moderate, or high) and the level of complexity to manage the site (straightforward or complicated). Standard impacts and mitigation measures typically apply to sites with low or moderate risk that are straightforward to manage.

Generally, sites ranked with low or moderate risk and straightforward complexity are situations that can be reasonably predicted based on experience and where mitigation measures can effectively control and/or minimize the impact based on best professional and engineering judgment. Mitigation measures are actions taken prior to and during construction to avoid or reduce the hazardous material impact. Mitigation measures prevent or reduce environmental impacts, minimize construction costs, and avoid or reduce WSDOT's future long-term cleanup costs associated with managing, remediation, and monitoring work.

The table is organized by Environmental (Direct, Indirect, Cumulative), Construction and Liability impacts and mitigation measures. Discipline report writers should select only the appropriate standard impacts and mitigation measures and tailor them for the project. The standard impacts and mitigation measures should also be updated as necessary.

Table # Standard Hazardous Materials Impacts & Mitigation Measures			
Impact Type	Impact	Mitigation Measure	Impacted Site Identification
Environmental Impacts	<b>Environmental Impacts</b> are impacts that the project causes to the environment or sensitive receptors.		
Direct Impacts to the Environment	<b>Direct Environmental Impacts<sup>1</sup></b> are impacts that a project causes that occur at the same time and place. Direct Impacts from construction activities are typically short term and temporary in nature		
Spills	<p>Accidental hazardous materials spills may occur due to construction activities. Construction sites involve various activities, equipment, and materials that can result in a release of hazardous materials into the environment. Traffic detours and lane closures can increase the risk of accidents that cause spills of hazardous materials or substances into the environment.</p> <p>Hazardous materials have the highest adverse affect on waters of the state (creeks, lakes, streams, wetlands, groundwater, stormwater catch basins, wellhead protection systems, etc.). Releases of relatively small amounts of chemicals to the ground may result in rapid migration to the water table. Hazardous materials also have the potential to harm endangered species or their habitat or to harm humans, such as children, the elderly, or the sick, who are sensitive to chemicals. Particulates of lead-based paint (LBP), asbestos-containing material (ACM), or spores of <i>Histoplasma capsulatum</i> can migrate off-site in dust particles. The contaminated dust can expose the surrounding populace to these materials.</p>	<p><u>A Spill Prevention, Containment, and Countermeasures (SPCC) Plan</u> is required for all WSDOT construction projects per Standard Specifications Section 1-07.15. Prior to beginning construction, the Contractor is required to prepare a project-specific plan to be used throughout the duration of the project. The plan must be updated to reflect actual site conditions and practices. Preventing a spill is the primary goal; however, the Contractor is expected to be prepared to minimize the impacts of a spill through immediate and appropriate response actions.</p> <p>In most cases, spills can be controlled and mitigated with the SPCC plan and normal erosion/runoff controls at the construction site. Care should be taken to prevent dust from traveling off-site by maintaining a water truck on-site to wet down areas around structures that may contain LBP, ACM, or fungal spores. All suspected LBP, ACM, and fungal-containing materials will be placed in appropriate containment as soon as it is removed from structures in order to decrease the possibility of exposure to the general public.</p>	
In-situ Soil and Groundwater Contamination	<p>Environmental impacts may result if contaminated soils and groundwater are not properly managed and are allowed to spread to clean soil, surface water, and/or groundwater. Contaminated water may also result from clean water coming into contact with contaminated stockpiled soil. The risk of encountering contaminated soil and groundwater is higher in areas that have a long and varied history of industrial and commercial land use, and especially near properties with underground storage tanks (USTs). Contamination not managed properly in accordance with existing regulations could potentially affect human health and ecological receptors.</p>	<p><u>Hazardous materials investigations</u> that identify known or suspected contaminated sites can allow WSDOT staff to make informed decisions regarding planning, acquisition, design, and/or construction options. Hazardous materials investigations are conducted early in the environmental planning, design, and acquisition phase. The reports often indicate the type and severity of contaminants in the area. These environmental reports are maintained in the Regional Environmental Office's project file.</p> <p><u>Alternative construction design or techniques</u> are used to avoid contaminated areas or minimize quantity of material generated. For example, different footing designs can lessen the area and depth of excavation to minimize the quantity of wasted soil generated. Another example is using driven piles where concrete is tremied into place to limit the volume of dewatering.</p> <p><u>WSDOT Standard Specifications</u> Section 1-07.5 requires the Contractor to comply with Environmental Regulations and current federal and state laws and regulations.</p> <p><u>General Special Provisions and Special Provisions</u> (GSPs and SPs) can be added to the construction contract when site-specific circumstances warrant special measures that can be contractually enforced. GSPs are used when the contamination is predicted but not known. SPs are project-specific and used for known contamination. GSPs and SPs can inform the Contractor of known or potential contaminants and the investigative reports that are available for the Contractor's review. Once informed, the Contractor is responsible for safely and responsibly managing contamination in accordance with all federal, state, and local laws.</p> <p><u>WSDOT Manuals</u> provide policy and procedures for hazardous materials encountered during construction. The <i>Environmental Procedures Manual</i> (31-11), Chapter 620.08 provides policy and procedures for identifying, handling, and disposing of hazardous materials encountered during construction. The <i>Construction Manual</i> (M41-01), Section 1-2.2K provides WSDOT staff guidance and procedures to ensure environmental compliance during construction.</p> <p><u>Proper planning and training</u> should be conducted for projects likely to encounter contamination. Planning should address the project-specific needs (e.g., limited space constraints preventing ability to stockpile contaminated soil or store several Baker tanks) to identify specific techniques and training requirements needed to effectively manage the hazardous materials generated during construction. Training should include key construction staff and project inspectors to recognize hazardous materials and understand appropriate protocols for safely isolating, containing, characterizing, and properly disposing of hazardous materials, and for securing disposal documentation.</p> <p><u>WSDOT Hazardous Materials and Solid Waste Program</u> staff is available to provide construction support by giving guidance and recommendations for general hazardous materials management procedures.</p> <p><u>WSDOT On-call environmental consultants</u> are available to provide hazardous materials management support. For projects that expect to encounter</p>	

<sup>1</sup> See 40 CFR 1508.8(a) (NEPA implementing regulations)

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			contaminants, it is recommended that a contract with an environmental consultant be established prior to the start of construction.
	<b>Indirect Impacts to the Environment</b>	<b>Indirect Impacts<sup>2</sup></b> (also known as secondary & operational impacts), are impacts caused by a project that occur later in time or further removed in distance, but are still reasonably foreseeable. Indirect impacts caused by a project usually include changes in land use, water quality, social issues, and population density.	
	<b>Traffic Flow</b>	Vehicle accident spills and long-term ongoing vehicular use and road maintenance may contaminate adjacent soils and surface water. Hazardous materials associated with accident spills, vehicular use, and roadway maintenance typically include petroleum products and metals. Improved traffic flow from the project will reduce vehicle accidents, traffic, and the amount of hazardous materials leaked from vehicles while in traffic and spilled during vehicle accidents.  Alternatively, improved roadways may increase traffic volume, creating the potential for increased vehicular accidents that over time may result in the accumulation of contaminants in the soil, sediment, surface water, and/or groundwater.	Post-construction operation is generally expected to improve potential environmental impacts with increased traffic flow and safety. WSDOT will notify Washington State Department of Ecology (Ecology) and Washington State Patrol in the event of an accidental spill during the operational phase. Ecology serves as the state's Incident Command for emergency spills and, as such, responds to spills within highway rights-of-way.
	<b>Maintenance</b>	Additional operational impacts may include herbicides used as part of WSDOT's roadside vegetation management program and minerals associated with deicing activities.	Chemicals used to maintain existing roadways and vegetation are applied in accordance with manufacturers' specifications, in a manner that designed to minimize harm to the environment.
	<b>Cumulative Impacts to the Environment</b>	<b>Cumulative Impacts<sup>3</sup></b> are impacts to the environment that result from incremental impacts of a project when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes those actions. "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" and eventually lead to a measurable environmental change.	
	<b>In-situ Soil and Groundwater Contamination</b>	Transportation projects typically have a positive impact on the environment because the project work typically removes and properly disposes of USTs, contaminated soil, and contaminated groundwater. This eliminates potential contaminant sources and removes contamination that might otherwise have remained in the environment and continued to migrate.  Paving work can cap contamination and prevent the spread of contaminants through infiltrating stormwater.	As contaminated media are uncovered and cleaned up during project construction, there is an improvement in environmental quality and an increase in economic development. This leads to the overall beneficial cumulative effect to the area.
	<b>Stormwater</b>	Impacts of hazardous materials and waste from normal operations would primarily be associated with runoff of contaminants entrained in stormwater. Contaminants likely to be in stormwater runoff include petroleum products, metals, and automobile engine coolants such as ethylene glycol.	Mechanisms should be in place that would allow for the detention of contaminants within the surface runoff from impervious surfaces. Stormwater and water quality treatment facilities should be designed to collect and retain pollutants from traffic operations and improve water quality. These issues are addressed in more specific detail within the Water Resources Discipline Study because operational impacts related to hazardous waste and water are primarily associated with stormwater quality.
<b>Construction Impacts</b>			
	<b>General</b>	Construction delays and increased costs often result from unexpected encounters of contamination. Delays are typically caused by segregating and containing contaminants, coordinating sample collection, waiting for laboratory results, identifying a permitted disposal facility, completing the disposal facility's waste profile sheet, and coordinating haul and disposal. Increased costs result from payments to the Contractor during delay, payments to a qualified professional to obtain and analyze samples, laboratory charges, and expensive disposal fees.  The subcategories below discuss the following specific types of construction impacts along with associated regulations.  <ul style="list-style-type: none"> <li>▪ Contaminated Soil and Water</li> <li>▪ Underground Storage Tanks (USTs)</li> <li>▪ Spills</li> <li>▪ Demolition</li> <li>▪ Worker Safety &amp; Public Health</li> </ul>	These mitigation measures apply to all the general impacts during construction. Additional mitigation measures apply to each subset of impacts.  <u>Hazardous materials investigations</u> that identify known or suspected contaminated sites can allow WSDOT staff to determine how to avoid or minimize potential construction impacts. Hazardous materials investigations are conducted early in the environmental planning, design, and acquisition phase. Investigation reports allow WSDOT staff to make informed decisions regarding planning, acquisition, design, and/or construction options. The reports often indicate the type and severity of contaminants in the area. Even if contamination is not identified prior to construction, hazardous materials investigations are still an important resource during construction when contamination is unexpectedly encountered, because WSDOT staff know the historical land use of the site. These environmental reports are maintained in the Regional Environmental Office's project file. Hazardous materials investigations and environmental reports include, but are not limited to:  <ul style="list-style-type: none"> <li>▪ Hazardous Material Discipline Reports (Historical &amp; record investigation for project corridors)</li> <li>▪ Site Reconnaissance / Windshield Surveys</li> <li>▪ Phase I Environmental Site Assessment (Historical &amp; record Investigation for a site)</li> <li>▪ Phase II Environmental Site Assessment (Sampling)</li> <li>▪ Phase III Environmental Site Assessment (a.k.a. Remedial Investigation / Feasibility Study. Evaluates cleanup options &amp; costs)</li> <li>▪ UST and/or aboveground storage tank (AST) Closure Reports</li> <li>▪ ACM/LBP Surveys</li> </ul> <u>Alternative construction design or techniques</u> are used to avoid contaminated areas or minimize quantity of material generated. For example, different footing designs can lessen the area and depth of excavation to minimize the quantity of wasted soil generated. Another example is using driven piles where concrete is tremied into place to limit the volume of dewatering.

<sup>2</sup> See 40 CFR 1508.8(b) (NEPA implementing regulations)

<sup>3</sup> See 40 CFR 1508.7 (NEPA implementing regulations)

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			<p><u>WSDOT Standard Specifications</u> Section 1-07.5 requires the Contractor to comply with Environmental Regulations and current rules of resource agencies. The Contractor is required to prevent spreading or contributing to existing contamination and appropriately dispose waste material in a manner consistent with federal, state, and local regulations. Section 1-07.04(2) of the Standard Specifications requires the Contractor to take precautions and perform any necessary work to provide and maintain a safe and healthful worksite in accordance with applicable laws. Sections 1-07.15 and 8.01 require the Contractor to prepare and implement a project-specific Temporary Erosion and Sediment Control Plan, which addresses prevention of wind dispersion of soil and water pollution during construction. Section 1-07.15(1) requires the Contractor to prepare and implement an SPCC Plan, which addresses both spills from hazardous materials use (including petroleum) and specific measures to prevent release or further spreading of materials in areas with identified preexisting contamination.</p> <p><u>GSPs and SPs</u> can be added to the construction contract when site-specific circumstances warrant special measures that can be contractually enforced. GSPs are used when the contamination is predicted but not known. SPs are project-specific and used for known contamination. GSPs and SPs can inform the Contractor of known or potential contaminants and the investigative reports that are available for the Contractor's review. Once informed, the Contractor is responsible for safely and responsibly managing contamination in accordance with all federal, state, and local laws. GSPs and SPs can include specific requirements related to containment, removal, and disposal of hazardous materials, USTs, and contaminated soil and water. GSPs and SPs can also establish certification requirements of personnel, notification procedures, and documentation requirements.</p> <p><u>WSDOT Manuals</u> provide policy and procedures for hazardous materials encountered during construction. The <i>Environmental Procedures Manual</i> (31-11), Chapter 620.08 provides policy and procedures for identifying, handling and disposing of hazardous materials encountered during construction. The <i>Construction Manual</i> (M41-01), Section 1-2.2K provides guidance and procedures to ensure environmental compliance during construction.</p> <p><u>Proper planning and training</u> should be conducted for projects likely to encounter contamination. Planning should address the project-specific needs (e.g., limited space constraints preventing ability to stockpile contaminated soil) to identify specific techniques and training requirements needed to effectively manage the hazardous materials generated during construction. Training should include key construction staff and project inspectors to recognize hazardous materials and understand appropriate protocols for safely isolating, containing, characterizing, and properly disposing of hazardous materials, and for securing disposal documentation.</p> <p><u>WSDOT Hazardous Materials and Solid Waste Program</u> staff is available to provide construction support by giving guidance and recommendations for general hazardous materials management procedures. When resources are not available, the WSDOT project office can direct and manage environmental consultants in coordination with regional offices. This enables efficient work with the least amount of impact to construction schedule and budget as possible.</p> <p><u>WSDOT On-call environmental consultants</u> are available to provide hazardous materials management support. Services include, but are not limited to: contaminant screening to identify and segregate potentially contaminated media; sampling; laboratory results QA/QC and interpretation; recommendations for proper management, reuse, or disposal options; preparation of waste profile forms; and assisting with waste manifesting and tracking. A contract with an environmental consultant should be established prior to the start of construction for projects that are expected to encounter contaminants.</p>	
	<p><b>In-situ Soil and Groundwater Contamination</b></p>	<p>Construction delays and increased costs often result from unexpected encounters of contamination in soil and water. Delays related to stockpiling contaminated soil, dewatering contaminated water into storage containers, coordinating sample collection, waiting for laboratory results, identifying a permitted disposal facility, completing the disposal facility's waste profile sheet, and coordinating haul and disposal. Increased costs result from payments to the Contractor during the delay, payments for containment supplies, payments to a qualified professional to obtain and analyze samples, laboratory charges, and expensive disposal fees.</p> <p>Construction (staging) activities may be impacted depending upon the need to alter their proximity due to contaminated media, USTs, etc.</p>	<p><u>Prior to Construction:</u> Hazardous materials investigations conducted early in the project development phase can identify known and potentially contaminated sites within a project corridor. The reports often indicate the type and severity of contaminants in the area. These investigations identify known or suspected contaminated sites and allow WSDOT staff to make informed decisions regarding planning, acquisition, and design and/or construction options. These environmental reports are maintained in the Regional Environmental Office's project file.</p> <p>Mitigation measures for contaminated soil and groundwater include pre-construction planning to define the areas where contamination may be encountered, design changes to minimize contaminated media that must be managed, and implementing practical cleanup alternatives for contaminated soil and groundwater. Mitigation includes incorporating GSPs and project-specific SPs, which makes the Contractor responsible for being prepared to appropriately handle contaminated material with minimal delays.</p> <p><u>Proper planning and training</u> should be conducted for projects likely to encounter contamination. Planning should address the project-specific needs (e.g., limited space constraints preventing ability to stockpile contaminated soil or store several Baker tanks) to identify specific techniques and training requirements needed to effectively manage the hazardous materials generated during construction. Training should include key construction staff and project inspectors to recognize hazardous materials and understand appropriate protocols for safely isolating, containing, characterizing, and properly disposing of hazardous materials, and for securing disposal documentation.</p> <p><u>Contaminated Media Management Plans (CMMPs)</u> are developed when significant amounts of known contaminated soil, groundwater, and sediment requires excavation or dewatering. CMMPs establish specific handling and disposal procedures and chains or responsibility to effectively manage contaminated soil and groundwater as it is encountered in order to minimize schedule delays and excessive costs. A comprehensive CMMP would address field screening methods, notification requirements, soil stockpile management, and sampling and disposal requirements.</p> <p><u>During Construction:</u> For encounters of known or unknown contaminated soil or groundwater, project offices are directed to contact their WSDOT Hazardous Materials Specialist. A WSDOT Hazardous Materials Specialist or other contracted qualified environmental professional will provide the project office direction and technical support. Internal notification to WSDOT Hazardous Materials Specialists also ensures that the appropriate follow-up work (should contamination be left in place) is conducted in accordance with Model Toxics Control Act (MTCA) regulations. WSDOT's policy and procedures for identifying, handling, disposing of, and documenting contamination encountered during construction is contained in EM Chapter 620.08. Timely, proper management of contaminated media can prevent spreading contaminants to clean soil, surface waters, and the air and can reduce construction delays and cost increases. Alternative construction techniques may need to be employed to minimize earthwork occurring near any of the above-mentioned liability issues. WSDOT and/or its contractors would be responsible for proper management of any</p>	

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	<p><b>USTs</b></p>	<p>USTs may be encountered during excavation activities. USTs may be filled with product and have the potential of creating a spill if the tank is ruptured. USTs in residential areas are likely to contain heating oil, whereas tanks used in commercial/industrial fueling will typically contain automobile fuel and other petroleum products. USTs in the automobile or machine repair business will typically contain petroleum, waste oil, and hydraulic and transmission fluids where commonly associated contaminants include petroleum, heavy oil, metals, and polychlorinated biphenyls (PCBs).</p> <p>Construction delays and increased costs often result from unexpected encounters of USTs. Contaminated soil and/or groundwater associated from USTs can affect project schedules and increase costs.</p>	<p>regulated hazardous wastes.</p> <p>Hazardous materials investigations can identify documented Leaking Underground Storage Tanks (LUSTs), active regulated USTs, or potential historical UST sites. USTs can also be identified through Ecology's Facility Site Atlas (internet mapping system), ground penetrating radar, and old WSDOT right-of-way maps. Early identification of known or potential UST sites allows WSDOT staff to remove tanks, associated piping, and contaminated soil prior to project construction or incorporate GSPs in the construction contract requiring the Contractor to remove USTs during construction in accordance with the regulations.</p> <p>WSDOT would assume cleanup liability for decommissioning and removal of suspected USTs if a UST is encountered during excavation activities. WSDOT may also acquire cleanup liability for any contaminated media resulting from a leaking UST in the right-of-way. WSDOT will follow procedures and regulations for decommissioning USTs as outlined in EM Chapter 620.08.</p> <p>For unexpected encounters of USTs, project offices will contact their WSDOT Hazardous Materials Specialist and follow internal notification procedures prescribed in the Construction Manual (M41-01.05) Section 1-2.2K(1) for the Environmental Compliance Assurance Procedure (ECAP). A WSDOT Hazardous Materials Specialist or other contracted qualified environmental professional provides the project office direction or oversight to ensure compliance with UST regulations and the appropriate follow-up work in accordance with MTCA regulations.</p>	
	<p><b>Spills</b></p>	<p>Construction delays and increased costs may result in the event of a spill and cleanup work of hazardous materials that are used or generated during construction. Construction vehicles and equipment typically use gasoline, diesel, motor oil, transmission fluid, radiator coolant, brake fluid, and hydraulic oil. New construction work typically uses cement, asphalt, tar, paving oils, tack, and paint.</p>	<p>WSDOT project office will follow the internal notification procedures prescribed in the Construction Manual (M41-01.05) Section 1-2.2K(1) for the ECAP to report spills of hazardous materials. An SPCC Plan is also required for all WSDOT construction projects per Standard Specifications Section 1-07.15. Prior to beginning construction, the Contractor is required to prepare a project/site-specific plan to be used throughout the duration of the project. The plan must be updated to reflect actual site conditions and practices. Preventing a spill is the primary goal; however, the Contractor is expected to be prepared to minimize the impacts of a spill through immediate and appropriate response actions. The required elements of the SPCC plan includes:</p> <ol style="list-style-type: none"> <li>1. Responsible Personnel</li> <li>2. Spill Reporting</li> <li>3. Project and Site Information</li> <li>4. Potential Spill Sources</li> <li>5. Preexisting Contamination</li> <li>6. Spill Prevention and Response Training</li> <li>7. Spill Prevention</li> <li>8. Spill Response</li> <li>9. Project Site Map</li> <li>10. Spill Response Forms</li> </ol>	
	<p><b>Demolition</b></p>	<p><u>Increased costs and delays</u> may result when demolition requires special handling and disposal of certain equipment, materials, or structures. Special demolition considerations can include:</p> <ol style="list-style-type: none"> <li>a) <b>ACMs</b> are likely to exist in buildings constructed prior to 1985. ACM poses risks to public and worker safety when disturbed for maintenance, renovation, and demolition of structures. If a survey is not completed prior to construction, the project may be delayed.</li> <li>b) <b>LBP</b> is likely to exist in structures built before 1978 and is typically found on steel bridge structures. LBP poses risks to environmental health and worker safety when disturbed for maintenance, renovation, and demolition of structures including bridges and buildings. If a survey is not completed prior to construction, the project may be delayed.</li> <li>c) <b>USTs</b> and associated piping (See sub-category above for specific UST impacts)</li> <li>d) <b>ASTs</b> and other containers (such as drums, cans, and bottles) that store hazardous materials</li> <li>e) <b>Universal Waste</b>, defined in Chapter 173-303 WAC, batteries, lamps, thermostats, and mercury-containing equipment</li> <li>f) <b>Creosote or Arsenic [a.k.a. Chromated Copper Arsenate (CCA)] treated wood</b>, such as railroad ties, telephone poles, and marine pilings</li> <li>g) <b>PCB-containing equipment</b> in aboveground utilities</li> <li>h) <b>Well decommissioning</b>, including groundwater monitoring, extraction, treatment, and supply wells</li> </ol>	<p>Prior to demolition work, hazardous materials surveys with follow-up sampling (where required) should be conducted to identify equipment, materials, and structures that require special handling or disposal. A comprehensive building survey and sampling program helps limit the amount of material required for special removal and disposal. In addition, surveys help avoid the potential for environmental contamination and construction delays and promote worker health and safety. It is recommended that any demolition items (see list "Impact") that may be potential contaminant sources be clearly identified (locations and estimated quantities) and then appropriately handled, segregated, and removed for disposal as required by applicable regulations.</p> <p><b>ACM</b> is often found in commercial and residential buildings constructed prior to 1985. A pre-demolition building survey, conducted by an Asbestos Hazard Emergency Response Act (AHERA)-certified building inspector would verify the presence of ACM and provide locations and estimated quantities requiring special handling and disposal in a report. If ACM is identified, mitigation would consist of removing these materials in compliance with regulations prior to building demolition and disposal in a legally permitted facility (i.e., lined landfill). Regulations include specific notification, work practice, packaging, labeling, and disposal requirements. Chapter 620.08 of the EM provides additional mitigation measures details.</p> <p><b>LBP</b> poses risks to environmental health and worker safety when disturbed for maintenance, renovation, and demolition of structures including bridges and buildings. Testing and documentation should be completed as early in the project design phase as possible to determine if special procedures and disposal that will result in increased costs will be required for existing LBP. LBP testing, abatement, or related activities in Washington are required to be licensed by the Lead-Based Paint Program located within the Department of Community, Trade and Economic Development (CTED). Performing such activities without LBP certification from CTED is a violation of Chapter 365-230 WAC. Chapter 620.08 of the EM provides additional mitigation measure details.</p> <p>Standard removal, testing, and disposal protocols of LBP on bridge structures are described WSDOT Standard Specifications Section 6.07.3 and EM Chapter 6.08. Lead pipe or lead-painted metal can be recycled as scrap metal in accordance with WAC 173-303-071(3)(ff). If the material is not recycled, it must be evaluated to determine whether it requires management and disposal as a dangerous waste (per Chapter 173-303 WAC). Contractors are required to abide by WAC 296-62-07521 for general lead exposure health and safety.</p> <p><b>UST</b> mitigation information is provided above in the "USTs" row of this table. AST mitigation shall generally conform to UST mitigation.</p> <p><b>Universal Waste</b> poses a risk to the worker health, public safety, and the environment if improperly handled and disposed. A pre-demolition building survey should be conducted prior to demolition to identify these regulated materials and ensure that they are properly handled and disposed in accordance with WAC 173-303-573. Additional information is available in the following Ecology Publications:</p> <ul style="list-style-type: none"> <li>• The Universal Waste Rule, Publication 98-407</li> <li>• The Universal Waste Rule for Batteries, Publication 98-407a</li> </ul>	

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			<ul style="list-style-type: none"> <li>• The Universal Waste Rule for Mercury-containing Equipment and Thermostats, Publication 98-407b</li> <li>• The Universal Waste Rule for Lamps, Publication 98-407c</li> </ul> <p><b>Creosote or arsenic treated wood</b> may be reused even if the treated wood is designated as a hazardous/dangerous waste per a Toxics Characteristics Leaching Procedure (TCLP) test (See Chapter 173-303 WAC). However, its reuse must be utilized for its “intended end use” per 40 CFR 261.4(b)(9). This means that treated wood cannot be chipped or shredded for mulch and used in landscaping applications. Ecology encourages reuse of treated wood as a preferred management alternative. If reuse is not feasible, disposal facilities will most likely require sampling (TCLP test for arsenic) of treated wood to determine if it is designated as a Dangerous Waste (per Chapter 173-303 WAC). If not a Dangerous Waste, then the treated wood can be managed as a solid waste (per Chapter 173-304 WAC) and accepted into a Subtitle D landfill or a Waste-to-Energy incinerator (hog fuel). If the wood is designated as a Hazardous/Dangerous Waste, then disposal at a higher cost is required at a Subtitle C facility. Chapter 620.08 of the EM provides additional mitigation measure details.</p> <p><b>PCB-containing equipment</b>, particularly aboveground utilities, poses a risk to worker health, public safety, and the environment if improperly handled and disposed. A pre-construction survey should be completed to identify equipment of concern. PCB-containing equipment should be disposed of per federal and state regulations.</p> <p><b>Well decommissioning</b> is required when wells are unusable or abandoned, or will be impacted by the project. The wells should be identified during the design phase to determine if project design may affect a well. A licensed well driller is required to install and decommission wells. Licensed drillers complete the required Notice of Intent Forms (application), which allows Ecology to inspect a well as necessary to make sure it is completed or decommissioned according to state regulations. Additional regulatory requirements are available in the EM Chapter 540.25.</p>	
	<p><b>Worker Safety &amp; Public Health</b></p>	<p><u>Exposure of hazardous materials</u> to construction workers and the public may result during excavation and management of contaminated media (e.g., soil, groundwater, abandoned drums or containers) or from the misuse of hazardous substances used or generated on-site during construction activities. Typical exposures in these situations include ingestion, dermal contact, and/or inhalation. Contaminants including vapors that produce physical symptoms such as dizziness, irritated or burned skin and eyes, long-term serious injury, suffocation, and death may be present in excavations or drums. Minor spills of materials used in construction, such as fuels, lubricants, and hydraulic fluids, typically occur during construction operations. Exposure to such accidental release could damage skin, eyes, lungs, and other organs. Contaminants and vapors that are typical for WSDOT construction sites are primarily petroleum based, where concentrations are expected to be similar to exposures during fueling at public gas stations.</p> <p><u>Worker and public health and safety impacts</u> are also a concern due to the explosion and fire hazards posed by USTs and ASTs, and abandoned drums or containers. USTs/ASTs are an explosion hazard when vapors trapped within the tank reach explosive limits and detonate when ignited by a spark or some other incendiary device like a cigarette. Fire may produce irritating, corrosive, and/or toxic gases.</p> <p><u>Demolition work</u> may release ACM, LBP, and/or bird guano. Inhalation and ingestion of LBP, ACM, and/or bird guano could have a damaging effect on workers’ health. Common short-term symptoms of <b>lead</b> poisoning include abdominal pain, headaches, constipation, and aches in the joints. Exposure to high levels of lead poisoning can result in retardation, convulsions, coma, and death. The risks associated with low levels of contact with <b>asbestos</b> are not well established, so the EPA concludes there is no level of exposure below which the risks of contracting an asbestos-related disease are zero. Exposures to asbestos can result in long-term progressive illnesses including lung cancer, asbestosis, and mesothelioma. Histoplasmosis is an infectious disease caused by inhaling spores of a fungus called Histoplasma capsulatum found in <b>bird guano</b>.</p> <p><u>Construction delays and increased costs</u> may result when the Contractor is unaware of site-specific circumstances that would warrant special employee safety training, certification and/or preparation of a site-specific Worker Health and Safety Plan.</p>	<p><u>Hazardous materials investigations</u> (as described above) identify known or potentially contaminated areas early in project. This allows WSDOT project staff to incorporate a GSP or SPs into the contract to notify the Contractor of site-specific conditions. Copies of hazardous materials investigations are made available to the Contractor. When WSDOT informs the Contractor of these conditions, the Contractor is required to train the workers to recognize hazardous conditions in the work place and train them how to respond to and report such conditions.</p> <p>The Washington State Department of Labor and Industries requires that personnel receive proper training for working with hazardous materials and donning appropriate personal protective equipment. Depending on the nature of any contamination encountered during construction activities, worker safety training (such as 24- or 40-hour HAZWOPER training) may be required of personnel working on the site under Chapter 296-62 WAC. The Contractor must protect workers and the public from potential safety and health impacts. The Occupational Safety and Health Act (OSHA) establishes requirements for site safety procedures, worker training, and worker safety and health standards for employees engaged in work related to or potential exposure to hazardous materials/substances. The WSDOT Standard Specifications (applicable to all projects) Section 1-07.04(2) requires the Contractor to take precautions and perform any necessary work to provide and maintain a safe and healthful worksite in accordance with applicable laws.</p> <p>In addition to health and safety training, workers should be trained in procedures to prevent hazardous materials from migrating off-site and coming into contact with the public. Erosion and dust controls should be maintained on-site at all times during construction, and any materials suspected to contain lead or asbestos should be abated by professionals trained in the removal and disposal of these materials.</p> <p>According to the National Institute for Occupational Safety and Health, before an activity is started that may disturb any material that might be contaminated by Histoplasma capsulatum, workers should be informed in writing of the personal risk factors that increase an individual’s chances of developing histoplasmosis. Such a written communication should include a warning that individuals with weakened immune systems are at greatest risk of developing severe and disseminated histoplasmosis if they become infected. These people should seek advice from their health care provider about whether they should avoid exposure to materials that might be contaminated with Histoplasma capsulatum.</p>	
<p><b>WSDOT Liability</b></p>				

**WSDOT Standard Hazardous Material Impacts and Mitigation Measures – continued**

	<p><b>Acquisition – Cleanup Liability</b></p>	<p>WSDOT can inherit cleanup liability when 1) it acquires a contaminated site, 2) construction activities spread or cause contamination to become worse, or 3) final project construction prevents or obstructs a potentially liable party from conducting remedial activities. RCW 70-105D.040 identifies persons liable for a facility/property as: 1) the current or past facility owner/operator; 2) anyone who arranged for disposal/treatment of hazardous substances at the site; 3) anyone who transported hazardous substances for disposal/treatment at the site, unless it could legally receive the materials at the time of transport; or 4) anyone who sells a hazardous substance with written instructions for its use, where abiding by the instructions resulted in contamination. In situations where there is more than one liable party, each party is jointly and severally liable for costs associated with cleanup of a site and cost to repair damages to natural resources.</p> <p>Cleanup liability can become an expensive immediate or long-term cost. As a property owner, WSDOT would be liable for the cleanup of on-site contaminated soil and groundwater. Liability issues for sites with contamination can also extend beyond the property boundaries if contamination migrated off-site through soils or groundwater. In addition, WSDOT would be responsible for the removal of any stored or abandoned hazardous materials remaining on-site at the time of acquisition. WSDOT would incur the costs for characterization, cleanup, disposal, and potential long-term monitoring.</p> <p>WSDOT generally would not incur liability for groundwater contamination that has migrated into the project footprint as long as the agency does not acquire the source of the contamination. Any contaminated groundwater that has entered into the project footprint may create an impact to construction activities as described in further sections of this discipline study.</p>	<p>Hazardous materials investigations identify known or potentially contaminated sites early, which allow WSDOT project staff to avoid acquiring or excavating in contaminated sites. The preference is to avoid purchasing a contaminated site and avoid cleanup liability. However, there are options <i>prior to acquisition</i> to reduce liability risks when no feasible alternative or design option is available and WSDOT is forced to acquire and/or excavate contaminated property in order to complete a construction project.</p> <p>To manage potential cleanup liability risks, when necessary, WSDOT performs all appropriate inquiry <u>prior</u> to acquisition of and construction on potentially contaminated property. For WSDOT projects, “All appropriate inquiry” includes a site reconnaissance, and/or varied levels of Phase I and II Environmental Site Assessments generally following American Society for Testing and Materials (ASTM) standards 1527, 1528, and 1903. The type and level of environmental investigation is considered on a case-by-case basis in coordination with the WSDOT Hazardous Materials and Solid Waste Program.</p> <p>When USTs or contamination are identified prior to property acquisition, WSDOT should assign fair market property values that consider remediation costs and potential long-term (i.e., on-going monitoring and site management) cleanup costs. To limit potential liability risks prior to acquisition, WSDOT can use performance bonds, indemnifications, and other tools to minimize agency costs and cleanup liability.</p> <p><i>For sites that may be substantially contaminated</i>, WSDOT must clearly demonstrate that “All Appropriate Inquiry” (per 40 CFR Part 312) had been undertaken to discover, investigate, and characterize the hazardous substance and, once discovered, that due care was exercised to prevent the release or spread of contamination. Demonstrating All Appropriate Inquiry per EPA’s final rule establishes that WSDOT met specific regulatory requirements for conducting all appropriate inquiries into the previous ownership, uses, and environmental conditions of a property. This level of investigation should be considered only when WSDOT decides to acquire property that may be substantially contaminated and the responsible party is not performing cleanup or under an Agreed Order. Decisions regarding site cleanup should be made in coordination with the Hazardous Materials Program in order to ensure that the cleanup remedy will be “substantially equivalent of an Ecology conducted cleanup” to secure WSDOT’s ability to recover cleanup costs from solvent companies who are potentially liable.</p> <p>Additional guidance regarding appraisal and acquisition guidance is presented in WSDOT’s <i>Right-of-Way Manual</i> (M26-01), May 2006, Sections 4-4.4 D &amp; E and 6-5.14.</p>	
	<p><b>Spills</b></p>	<p>Hazardous materials spills that impact surface water, groundwater, sediment, or soils located within the project footprint may result in WSDOT and/or the Contractor incurring liability for an appropriate cleanup of the affected area and for environmental damages to state and federal agencies.</p>	<p>WSDOT project office will follow the internal notification procedures prescribed in the Construction Manual (M41-01.05) Section 1-2.2K(1) for the ECAP to report spills of hazardous materials. An SPCC Plan is also required for all WSDOT construction projects per Standard Specifications Section 1-07.15. The SPCC plan describes the process for prevention and response for spills of hazardous materials during construction.</p>	
	<p><b>Disposal</b></p>	<p>As an owner and/or generator, WSDOT could be subsequently liable for the cleanup of contaminated media disposed of at a non-permitted facility.</p>	<p>WSDOT maintains disposal documentation (i.e., lab data, sampling procedures, waste profile sheets, and disposal tickets) proving contaminated waste was properly characterized and disposed at a legally permitted facility. GSPs or project-specific SPs added to the construction contract require the Contractor to provide a copy of the shipping manifest or bill of lading indicating the amount of material hauled to disposal, and bearing the disposal site operator’s confirmation for receipt of the material. Standard Specifications Section 2-03.3(7) requires the Contractor to provide the WSDOT Project Engineer the location of disposal sites and copies of required permits and approvals before any waste is hauled off the project. Additional policy and procedures for identifying, handling, disposing, and documenting contamination encountered during construction is contained in EM Chapter 620.08.</p>	